Final Risk Evaluation for
n-Methylpyrrolidone

Systematic Review Supplemental File:

Data Quality Evaluation of Environmental Release
and Occupational Exposure Data

CASRN: 872-50-4
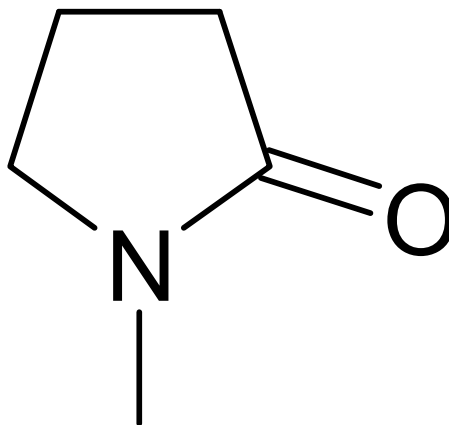
December 2020

This document is a compilation of tables for the data extraction and evaluation for N-Methylpyrrolidone (NMP). Each table shows the data point or set or information element that was extracted and evaluated from a data source in accordance with Appendix D of the *Application of Systematic Review in TSCA Risk Evaluations*. If the source contains more than one data set or information element, the review provides an overall confidence score for each data set or information element that is found in the source. Therefore, it is possible that a source may have more than one overall quality/confidence score.

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Explanatory Notes

These explanatory notes provide context to understand the short comments in the data evaluation tables.

Domain	Metric	Description of Comments Field
Reliability	Methodology	Indicates the sampling/analytical methodology, estimation method, or type of publication
Representativeness	Geographic Scope	Indicates the country of the study, publication, or underlying data
	Applicability	Indicates whether the data are for a condition of use within scope of the Risk Evaluation
	Temporal Representativeness	Provides the year of study, publication, or underlying data
	Sample Size	Describes the distribution of the sample or underlying data
Accessibility / Clarity	Metadata Completeness	Describes the completeness of the metadata
Variability and Uncertainty	Metadata Completeness	Indicates if study or publication addresses variability and uncertainty of the data or information

Releases to the Environment

Source Citation:	Solomon, G. M., Morse, E. P., Garbo, M. J., Milton, D. K.. 1996. Stillbirth after occupational exposure to N-methyl-2-pyrrolidone: A case report and review of the literature. Journal of Occupational and Environmental Medicine.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3043623

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	laboratory
Release Source:	Laboratory waste
Disposal /Treatment Method:	hazardous waste
Environmental Media:	hazardous waste
Release or Emission Factor:	100 percent released
Daily Release Quantity (kg/day):	1 L/day
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From an industry contact
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Use is in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1996 - more than 20 years old
	Metric 5: Sample Size	Medium	× 1	2	Information is from one source
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Kim, B. R., Kalis, E. M., Dewulf, T., Andrews, K. M.. 2000. Henry's law constants for paint solvents and their implications on volatile organic compound emissions from automotive painting. Water Environment Research.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3578170

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Painting
Release Source:	During painting, overspray paint materials are captured in continuously recirculating scrubber water and stored in a sludge pit. Periodically or continually (depending on operating conditions of an assembly plant), captured paint material (paint sludge) is separated from scrubber water and sent to a landfill. Spent scrubber water that contains VOCs is periodically discharged to a municipal wastewater treatment plant. At some assembly plants, a portion of VOCs in the exhaust air is captured and destroyed using vapor-phase adsorption followed by thermal oxidation before the air is emitted to the atmosphere.
Disposal /Treatment Method:	Wastewater, incineration
Release or Emission Factor:	80 percent of the PV (9700 kg/yr) is released in scrubber wastewater
Release Estimation Method:	Measured
Annual Release Quantity (kg/yr):	7700 kg/yr in scrubber wastewater
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Does not cover all releases at the site
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Use is in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1996
	Metric 5: Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative (11 samples)

Source Citation:	Kim, B. R., Kalis, E. M., Dewulf, T., Andrews, K. M.. 2000. Henry's law constants for paint solvents and their implications on volatile organic compound emissions from automotive painting. Water Environment Research.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3578170

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks release frequency
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		1.8	

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* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation of adhesive
Release Source:	Wash water from formulation equipment will be re-used in subsequent batches where possible. Otherwise, it will be treated on site and sludge disposed of to landfill. 50 percent of the wash water will be re-used in subsequent batches and the remainder released into the sewer. An estimated 100 kg of the notified polymer will be lost to landfill as residues in the empty import drums each year.
Disposal /Treatment Method:	WWT
Environmental Media:	Landfill, Water
Release Estimation Method:	Estimated by formulation and use company
Annual Release Quantity (kg/yr):	For polymer in formulation (polymer is 35 percent ; NMP is 5 percent) = 45 kg/yr (landfill from WWT); 5 kg/yr (water from WWT); 100 kg/yr (landfill from empty drums)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Likely to cover all releases
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia
Metric 3:	Applicability	High	× 2	2	Use is in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
Metric 5:	Sample Size	Low	× 1	3	Not characterized
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	data include all associated metadata
Domain 4: Variability and Uncertainty					

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3978357				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]		Medium		1.8	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Spray application of adhesive
Release Source:	The notifier estimates that approximately one third of the formulation will be lost as overspray. Of this, 50 percent will be trapped in the spray both water reservoir and 50 percent will be removed by the scrubber unit. All other dry wastes generated during the application of the basecoat, including the waste obtained from the periodic cleaning of scrubber baffles and filters will also be disposed of in landfill.
Disposal /Treatment Method:	WWT
Environmental Media:	Landfill, Water
Release Estimation Method:	Estimated by formulation and use company
Annual Release Quantity (kg/yr):	For polymer in formulation (polymer is 35 percent ; NMP is 5 percent) = 6.6 tonnes/yr (WWT)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Likley to cover all releases
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	High	× 2	2	Use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2001
	Metric 5: Sample Size	Low	× 1	3	Not characterized
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	data include all associated metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978357

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3982074

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	immersion degreasing
Release Source:	solvent dragout
Disposal /Treatment Method:	dragout
Release or Emission Factor:	1.94 grams/lb of parts cleaned
Daily Release Quantity (kg/day):	912 g/day (114 g/hr for 8 hrs)
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	may not cover all release sources at the site
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Cleaning is included in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1993
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks release frequency
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination†		Medium		2.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3982074

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	immersion degreasing
Release Source:	Evaporative losses during operation. Total bath solvent surface area is 10 in. x 24 in.
Environmental Media:	air
Annual Release Quantity (kg/yr):	10.96 grams/hour
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	may not cover all release sources at the site
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Cleaning is included in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1993
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks release frequency
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination[†]		Medium		2.1	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3828838

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	all
Release Source:	Releases to air from various generic unit operations, valves and other attachments. Residuals in drums and tanks
Environmental Media:	air, uncertain
Release or Emission Factor:	Average emission factors for unit operations are in Table 7.1. Emission factors for fugitive emissions from valves, etc. in Table 7.2. Drum residual LF in Table 7.3.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	OECD
	Metric 3:	Applicability	Medium	× 2	4	Generic information that can be applied to in-scope uses
	Metric 4:	Temporal Representativeness	High	× 2	2	2011
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	petrochemical processing aid?
Release Source:	wastewater effluent
Environmental Media:	POTW
Release or Emission Factor:	0, 33.7, 66.3 ug NMP/L wastewater
Release Estimation Method:	3 measurements taken at petrochemical plant

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Does not cover all releases at the site
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1996-1997
	Metric 5: Sample Size	High	× 1	1	3 samples, all results given
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Atsdr,. 2015. Health consultation: Review of air quality data: Intel Corporation " New Mexico facility: Rio Rancho, Sandoval County, New Mexico: EPA facility ID: NMD000609339, Part 2.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3970460

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics - photoresist remover?
Release Source:	unknown - based on company process operations, NMP was likely used as a photoresist remover in the 1990s and the facility switched to a different solvent in the 2000s
Environmental Media:	Air
Release Estimation Method:	TRI 1987-2013
Annual Release Quantity (kg/yr):	>9,000 lb in 1995; 0 pounds in 2013

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Does not cover all releases at the site
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1987-2013
	Metric 5: Sample Size	Medium	× 1	2	range provided in bar graph
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		2.0	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1997. Full public report: Polymer in byk-410.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978356

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	coating /paint formulation
Release Source:	release of polymer-NMP coating additive during formulation is estimated to be no more than 2 percent total. Incorporates all sources of release.
Environmental Media:	all
Release or Emission Factor:	2 percent
Release Estimation Method:	information from one formulation company
Annual Release Quantity (kg/yr):	55 kg/yr of polymer_NMP soln based on annual use rate of 2750 kg.yr

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Likely to cover all releases
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1997
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978358

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coating /additive in Papermaking
Release Source:	release to the environment may potentially occur from: leaking storage containers (less than 2 percent); accidental spills (less than 1 percent); during application (less than 10 percent) and disposal of residual material in containers (less than 5 percent). The worst case total of 20 percent released during the application to paper, corresponds to a maximum of 500 kg per annum at the maximum rate of import.
Environmental Media:	all
Release or Emission Factor:	10 percent
Release Estimation Method:	information from one papermaking company
Annual Release Quantity (kg/yr):	500 kg/yr of polymer-NMP soln based on annual import rate of 2,500 kg

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Likely to cover all releases
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	This was not identified as a use by EPA, but no uses are excluded from scope. May be applicable to coating OES?
	Metric 4:	Temporal Representativeness	Low	× 2	6	1998
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Release data include release media and source, but not frequency of release

Continued on next page

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978358

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]		Medium		2.1	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978358

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	architectural (concrete) coating
Release Source:	Release to the environment resulting from the use of the polymer as a concrete coating may occur to the sewer (washing of tools used to apply formulations containing the notified chemical), or to landfill (disposal of residual quantities of the formulations within used containers). Over-spray or splatter from rollers or brushes (These releases are likely to remain where they fall, mainly on the ground.)
Environmental Media:	Sewer; landfill

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Likely to cover all releases
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1998
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data element
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Release data include release media and source, but not frequency of release
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Medium		2.0	

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978358

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Erg,. 2000. Preferred and alternative methods for estimating air emissions from paint and ink manufacturing facilities.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982076

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Paint and ink formulation
Release Source:	material loading, heat-up losses, equipment leaks, spills, surface evaporation, liquid material storage, WWT
Environmental Media:	Fugitive air emissions from the listed release sources
Release or Emission Factor:	Provides examples of calculating emissions based on emission factors from AP-42, source-specific models, and mass balances.
Release Estimation Method:	AP-42 and models (not NMP-specific)
P2 Control & percent Efficiency:	Removal equipment available for treating VOC-containing air streams includes recovery devices (i.e., carbon adsorption, absorption, and condensation) and combustion devices (i.e., thermal incinerators, catalytic incinerators, and industrial boilers and process heaters). Control efficiencies for this equipment can range from 50 to 99 percent, but are most typically greater than 95 percent (EIIP, 2000). Carbon adsorbers, absorbers (scrubbers), condensers, and catalytic incinerators are generally not appropriate for paint and ink manufacturing facilities. Industrial and process heaters are capable of effectively treating the types and levels of VOCs generated by the paint and ink industry but are found in few, if any, paint and ink manufacturing facilities (EPA, 1992a).

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	From trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data element

Source Citation:	Erg,. 2000. Preferred and alternative methods for estimating air emissions from paint and ink manufacturing facilities.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982076

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mo, D. N. R.. 2001. State of Missouri toxics release inventory: Summary report: 1999 data.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3982077

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paints and adhesives used in the transportation equipment MFG sector
Release Source:	air emissions
Environmental Media:	Air
Release Estimation Method:	1999 TRI data for the state of Missouri
Annual Release Quantity (kg/yr):	83,500 kg/yr (in 1999 in Missouri)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Expected to cover all releases
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	1999
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†			Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mo, D. N. R.. 2001. State of Missouri toxics release inventory: Summary report: 1999 data.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3982077

EXTRACTION

Parameter	Data
Life Cycle Description (Subcategory of Use):	Unknown - emission data provide per company name (based on names, may include: wire coating, car painting, lab, solvent mfg, cement coating)
Release Source:	unknown - TRI data
Environmental Media:	Air, POTW, WWT, landfill, energy recovery
Release Estimation Method:	1999 TRI data for the state of Missouri
Annual Release Quantity (kg/yr):	see App C and G for site specific TRI emissions

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Expected to cover all releases
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Medium	× 2	4	Data may include info on in-scope uses, but cannot be determined without searching company names
	Metric 4:	Temporal Representativeness	Medium	× 2	4	1999
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†			Medium		2.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Technikon, L. L. C.. 2001. Core box cleaner study: Evaporative emission study of specialty systems' solvent FC-47-G1.	
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3982183	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning of casts /molds and hoppers in foundry applications
Release Source:	Study on the rate of evaporation of cleaning solution containing NMP at unknown concentration
Environmental Media:	Fugitive air
Release or Emission Factor:	0.00004 g of solvent soln/sec (see Fig 12 - 16)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	High quality techniques
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2001
	Metric 5: Sample Size	High	× 1	1	Fully characterized with multiple figures and charts
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination[†]		High		1.2	

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Chemistry Industry Association of, Canada. 2017. All substances emissions for 2012 and projections for 2015.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3982361

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Assumed = Paint formulation; Chemical Formulation
Release Source:	Source lists NMP emissions from sites in Canada. Source does not list the operations that occur at the sites. Assumed life cycle descriptions based on the names of the facilities.
Environmental Media:	Air
Annual Release Quantity (kg/yr):	0.1 tonnes/yr (2012)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Methodology is not specified
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Canada
	Metric 3:	Applicability	Medium	× 2	4	The operations at these sites are not characterized. Assumed to likely be in scope, but unknown,
	Metric 4:	Temporal Representativeness	High	× 2	2	2012
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The release data study does not address variability or uncertainty.
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Chemistry Industry Association of, Canada. 2017. All substances emissions for 2011 and projections for 2014.	
Type of Data Source	Releases to the Environment; Environmental Release Data;	
Hero ID	3982362	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Assumed = Paint formulation; Chemical Formulation
Release Source:	Source lists NMP emissions from sites in Canada. Source does not list the operations that occur at the sites. Assumed life cycle descriptions based on the names of the facilities.
Environmental Media:	Air
Annual Release Quantity (kg/yr):	0.05 tonnes/yr (2011)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Methodology is not specified
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Canada
	Metric 3:	Applicability	Medium	× 2	4	The operations at these sites are not characterized. Assumed to likely be in scope, but unknown,
	Metric 4:	Temporal Representativeness	High	× 2	2	2011
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The release data study does not address variability or uncertainty.
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Turner, S. L., McCrillis, R. C.. 2017. Evaluation of alternative chemical strippers on wood furniture coatings.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3986887

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Release Source:	VOC emissions during stripping
Environmental Media:	fugitive air
Release or Emission Factor:	158.94 to 263.74 g VOC /m2 substrate surface
Release Estimation Method:	VOC from stripping solutions containing NMP (solutions 2, 3, 4 in the study)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	The release data methodology is known or expected to be accurate (e.g., trusted source) but may not cover all release sources at the site
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	no date
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The release data study does not address variability or uncertainty.
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Campbell, H. L., Striebig, B. A.. 1999. Evaluation of N-methylpyrrolidone and its oxidative products toxicity utilizing the microtox assay. Environmental Science and Technology.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3566019

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	all
Release Source:	Study on the toxicity of byproducts from the oxidation of NMP in wastewater.
P2 Control & percent Efficiency:	Countercurrent wet scrubber was utilized to transfer the NMP vapor to the aqueous phase. The scrubber utilized water as the scrubbing liquor and removed greater than 97 percent of the NMP from the exhaust air stream at the facility

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	The assessment or report uses high quality data and/or techniques that are not from trusted sources; however, Associated information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Applicable to in-scope uses; but, information is on toxicity which is not used by engineering assessors (is used by exposure assessors)
	Metric 4: Temporal Representativeness	Medium	× 2	4	1999
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	Campbell, H. L.,Striebig, B. A.. 1999. Evaluation of N-methylpyrrolidone and its oxidative products toxicity utilizing the microtox assay. Environmental Science and Technology.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3566019

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.	
Type of Data Source	Releases to the Environment; Environmental Release Data;	
Hero ID	3860453	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	paint and coating formulation
Release Estimation Method:	releases from Envirofacts search
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF★	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

★★ Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

★ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Photographic Film, Paper, Plate, and Chemical Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3860453				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	All Other MiscellaneousC hemical Product and Preparation Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3860453				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Plastic Material and Resin Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	All Other Miscellaneous Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Cement Manufacturing see release
Annual Release Quantity (kg/yr):	rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

★★ Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

★ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Hazardous Waste Treatment and Disposal
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†			Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3860453				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Battery Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	All Other Basic Organic Chemical Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

⋆⋆ Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Distribution
Life Cycle Description (Subcategory of Use):	Other Chemical and Allied Products Merchant Wholesalers
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Semiconductor and Related Device Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.	
Type of Data Source	Releases to the Environment; Environmental Release Data;	
Hero ID	3860453	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Pesticide and Other Agricultural Chemical Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Adhesive Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Other Miscellaneous General Purpose Machinery Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	All Other Miscellaneous Waste Management Services
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.	
Type of Data Source	Releases to the Environment; Environmental Release Data;	
Hero ID	3860453	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Motor Vehicle Seating and Interior Trim Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF★	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

★★ Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

★ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Fabric Coating Mills
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

⋆⋆ Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Other Communication and Energy Wire Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

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† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other Electronic Component Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3860453				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Medicinal and Botanical Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Printing Ink Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Ophthalmic Goods Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Polish and Other Sanitation Good Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.				
Type of Data Source	Releases to the Environment; Environmental Release Data;				
Hero ID	3860453				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Pharmaceutical Preparation Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.	
Type of Data Source	Releases to the Environment; Environmental Release Data;	
Hero ID	3860453	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Leather and Hide Tanning and Finishing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2008-present
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Pollution prevention search results, envirofacts database.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Urethane and Other Foam Product (except Polystyrene) Manufacturing
Annual Release Quantity (kg/yr):	see release rates in report
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The release data methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2008-present
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	has no release media or other information
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1998. N-methylpyrrolidone(NMP): Biodegradability.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982075

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Release Source:	Information on the biodegradability of NMP and use of WWT to treat/ remove NMP from wastewaters
Waste Treatment Method:	WWTP

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Information is not related to a life cycle stage, but is broadly applicable
	Metric 4: Temporal Representativeness	Low	× 2	6	1998
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Paint and coating removers
Release Source:	Paint strippers
Disposal /Treatment Method:	Sent to Wastewater treatment
Release or Emission Factor:	0.07 kg/site-day
Annual Release Quantity (kg/yr):	2500 - 3770
Release Days per Year:	250.0

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Manufacturing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†			Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592033

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Release Source:	Electrode drying process and NMP recovery system.
Disposal /Treatment Method:	NMP is recycled for reuse or taken by licensed haulers for off-site recycling. Exhaust from recovery systems may be collected and discharged to the municipal sewer in compliance with wastewater permit conditions (and may contain approximately 0.9 percent NMP). Some amount released to air.
P2 Control & percent Efficiency:	Manufacturers capture vapor driven off by the electrode drying process, condense the vapor, and either recover or dispose of the liquid. During the drying process, the NMP solvent is volatilized and the "oven air" can be captured and conveyed to an NMP recovery system, with up to approximately 12 percent immediately returned to the coating/drying system and the remainder sent through the NMP recovery system on or off site. Description of recovery system provided on pg. 17.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a trade association of manufacturers. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					

Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).				
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592033				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	FUJIFILM Holdings America Corporation. 2020. FUJIFILM comments for docket ID # EPA-HQ-OPPT-2019-0236 for CASRN 872-50-4, n-methylpyrrolidone (NMP).
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592030

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation into solutions for electronics industry
Release Source:	all
Disposal /Treatment Method:	off-site recycling (solvent recovery or fuel blending)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986801

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - semiconductors
Release Source:	spin coating
Disposal /Treatment Method:	off-site incineration
Release or Emission Factor:	In the spin coat process, between 1-7 percent of the deposited liquid remains on the wafer; the remainder is spun off the wafer with 1 percent remaining in the tool and removed during tool cleaning and the balance collected via solvent waste drain for off-site disposal
Release Estimation Method:	OECD ESD

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from OECD, which is a trusted source
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	OECD
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics. It is unclear if analysis is representative
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Some discussion on variability
Overall Quality Determination†			High		1.3	

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986801

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Intel Corporation. 2020. Comments of Intel to the United States Environmental Protection Agency on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone. EPA-HQ-OPPT-2019-0236-0064.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	6592034

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - semiconductors
Release Source:	All releases from 2 semiconductor manufacturing sites
Disposal /Treatment Method:	On-site wastewater treatment then discharge to POTW
Environmental Media:	water
Release or Emission Factor:	the estimated concentration of NMP from the combined Hillsboro and Aloha facilities to the receiving body of water would be reduced from 1,995 ug/l to 619 ug/l.
Annual Release Quantity (kg/yr):	Hillsboro facility (2015): 510,000 lbs/yr NMP released to POTW; Aloha facility (2015): 170,000 lbs/yr NMP released to POTW
P2 Control & percent Efficiency:	92 percent of the NMP from the Hillsboro facility will be removed during onsite wastewater treatment system, and the remaining NMP from the Hillsboro facility will be reduced by another 92 percent at the POTW.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Release data is provided by the company; company expected to have accurate accounting of their releases. Reported releases include all water releases.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2015
	Metric 5:	Sample Size	Medium	× 1	2	Single data point or range provided. It is unclear if analysis on wastewater treatment efficiency is representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Release data include release media but no other metadata.

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Source Citation:	Intel Corporation. 2020. Comments of Intel to the United States Environmental Protection Agency on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone. EPA-HQ-OPPT-2019-0236-0064.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	6592034

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The release data study does not address variability or uncertainty.
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	National Electrical Manufacturers Association. 2020. NMP use in magnet wire. EPA-HQ-OPPT-2019-0236-0047.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - magnet wires
Release Source:	Emissions consist of evaporation from the NMP bath and from the cleaned parts removed from the bath. Some NMP vapors may be emitted, for example, during equipment cleaning.
Disposal /Treatment Method:	Any vapor emitted during application moves directly into the curing oven wherein at least 90 percent of the NMP combusts3. Depending on the type of oven, operating temperatures range from 800 1400F degrees.
Environmental Media:	Almost all operating lines now have an incinerator. Any liquid waste NMP and/or solid waste wet with NMP (paper, plastic, rags, etc.) are handled in compliance with the Resource Conservation and Recovery Act (RCRA).

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Incineration efficiency is provided as a single value with uncertain statistics. It is unclear if analysis is representative
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Data source for the estimate of NMP destruction is not fully transparent.
Domain 4: Variability and Uncertainty						

Source Citation:	National Electrical Manufacturers Association. 2020. NMP use in magnet wire. EPA-HQ-OPPT-2019-0236-0047.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592028

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The release data study does not address variability or uncertainty.
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Occupational Exposure

Source Citation:	Nishimura, S.,Yasui, H., Miyauchi, H., Kikuchi, Y., Kondo, N., Takebayashi, T.,Tanaka, S.,Mikoshiba, Y.,Omae, K.,Nomiyama, T.. 2009. A cross-sectional observation of effect of exposure to N-methyl-2-pyrrolidone (NMP) on workers' health. Industrial Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	735269

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning of instruments
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.14-0.26 ppm (mean); 0.8 ppm (max)
Number of Samples:	70.0
Number of Sites:	1.0
Type of Measurement or Method:	full-shift
Worker Activity:	all activities during a day
Number of Workers:	14
Type of Sampling:	personal
Exposure Duration:	8 hrs
Exposure Frequency:	5 days/wk
PPE:	None of the NMP-exposed workers wore any protective respiratory devices or clothing. All wore disposable, thin protective gloves made of polyethylene

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Methodology is explained and seems legitimate
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Japan
	Metric 3: Applicability	High	× 2	2	Cleaning is included in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2009
	Metric 5: Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized.

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Source Citation:	Nishimura, S.,Yasui, H.,Miyauchi, H.,Kikuchi, Y.,Kondo, N.,Takebayashi, T.,Tanaka, S.,Mikoshiba, Y.,Omae, K.,Nomiyama, T.. 2009. A cross-sectional observation of effect of exposure to N-methyl-2-pyrrolidone (NMP) on workers' health. Industrial Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	735269

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks worker actitities and whether its TWA
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.2	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Haufroid, V., Jaeger, V. K., Jeggli, S., Eisenegger, R., Bernard, A., Friedli, D., Lison, D., Hotz, P.. 2014. Biological monitoring and health effects of low-level exposure to N-methyl-2-pyrrolidone: a cross-sectional study. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	2654929

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal or through other uses of NMP
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.18 (mean), 0.89 (75th), 2.77 (90th), and 25.83 (Max) mg/m3
Number of Samples:	91.0
Number of Sites:	21.0
Type of Measurement or Method:	full-shift
Worker Activity:	graffiti removal or other activities associated with the life cycle
Number of Workers:	91
Type of Sampling:	personal
Exposure Duration:	310525 min
Exposure Frequency:	varies
PPE:	Suitable masks, butyl or latex gloves

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Airborne NMP was determined according to the NIOSH method.
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Multiple European Countries
Metric 3:	Applicability	High	× 2	2	All described conditions of use are in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2006-2011
Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized.
Domain 3: Accessibility/Clarity					

Source Citation:	Haufroid, V.,Jaeger, V. K.,Jeggli, S.,Eisenegger, R.,Bernard, A.,Friedli, D.,Lison, D.,Hotz, P.. 2014. Biological monitoring and health effects of low-level exposure to N-methyl-2-pyrrolidone: a cross-sectional study. International Archives of Occupational and Environmental Health.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	2654929				

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks worker activities and whether its TWA
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.6	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Solomon, G. M., Morse, E. P., Garbo, M. J., Milton, D. K.. 1996. Stillbirth after occupational exposure to N-methyl-2-pyrrolidone: A case report and review of the literature. Journal of Occupational and Environmental Medicine.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3043623

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Laboratory
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 mg/m3
Type of Measurement or Method:	2-hour short term
Number of Workers:	15
Type of Sampling:	personal and area
Exposure Duration:	Average of 42 hours each week
Exposure Frequency:	3-4 days/wk
Engineering Control & percent Exposure Reduction:	LEV over the spectrophotometers, but there was no LEV over the countertop, on which the patient filtered the NMP
PPE:	half-face air-purifying respirator, coat, safety goggles, and latex gloves

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1996 - more than 20 years old
	Metric 5:	Sample Size	Low	× 1	3	Distribution not characterized
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks worker activities and whether its TWA
Domain 4: Variability and Uncertainty						

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Source Citation:	Solomon, G. M.,Morse, E. P.,Garbo, M. J.,Milton, D. K.. 1996. Stillbirth after occupational exposure to N-methyl-2-pyrrolidone: A case report and review of the literature. Journal of Occupational and Environmental Medicine.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3043623				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Belanger, P. L., Coye, M. J.. 1983. Health Hazard Evaluation Report No. HETA-79-129-1350, San Francisco Newspaper Agency, San Francisco, California.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3101190

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Printing
Physical Form:	particulate
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.12 - 3.29 mg/m3
Number of Samples:	43.0
Number of Sites:	1.0
Type of Measurement or Method:	full-shift TWA
Type of Sampling:	personal
Exposure Duration:	5.17 - 7.92 hours

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	$\times$ 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	High	$\times$ 1	1	US
Metric 3:	Applicability	Medium	$\times$ 2	4	in scope, but data is not NMP-specific (i.e., surrogate data)
Metric 4:	Temporal Representativeness	Low	$\times$ 2	6	1983
Metric 5:	Sample Size	High	$\times$ 1	1	Fully characterized
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	$\times$ 1	1	Fully characterized
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	$\times$ 1	2	Some discussion

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Source Citation:	Belanger, P. L.,Coye, M. J.. 1983. Health Hazard Evaluation Report No. HETA-79-129-1350, San Francisco Newspaper Agency, San Francisco, California.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3101190

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Belanger, P. L.,Coye, M. J.. 1983. Health Hazard Evaluation Report No. HETA-79-129-1350, San Francisco Newspaper Agency, San Francisco, California.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3101190

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Printing
Physical Form:	particulate
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.27 - 0.68 mg/m3
Number of Samples:	5.0
Number of Sites:	1.0
Type of Measurement or Method:	partial shift
Type of Sampling:	personal
Exposure Duration:	3.33 - 3.58 hours

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	in scope, but data is not NMP-specific (i.e., surrogate data)
	Metric 4: Temporal Representativeness	Low	× 2	6	1983
	Metric 5: Sample Size	High	× 1	1	Fully characterized
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Fully characterized
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Some discussion

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3101190

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M., Rosenberger, W., Rebe, T., Keener, S. A., Brock, T. H., Hemmerling, H. J., Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning of optical and metal parts
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	average = 2 mg/m3; max = 2.8 mg/m3
Number of Sites:	2.0
Type of Measurement or Method:	12-hr TWA
Worker Activity:	cleaning of optical and metal parts
Number of Workers:	12
Type of Sampling:	personal
Exposure Duration:	12 hr

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Japan
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3539720				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty.
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ranged between 0.03 and 4.52 mg/m3; mean - 1.01 (+ or - 0.89) mg/m3; peak = 24.6 mg/m3
Type of Measurement or Method:	8-hr TWA; short-term peak
Type of Sampling:	personal
Exposure Duration:	8 hr

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Sweden
	Metric 3:	Applicability	Medium	× 2	4	Similar to an occupational scenario within the scope of the risk evaluation
	Metric 4:	Temporal Representativeness	Low	× 2	6	1993-2001
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3539720				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty.
Overall Quality Determination†		Medium		2.2	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	average = 3.0 mg/m3
Number of Sites:	1.0
Worker Activity:	production area
Number of Workers:	7
Type of Sampling:	area
PPE:	cotton working clothes, butyl rubber gloves during the cleaning process and safety eyeglasses

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	High	× 2	2	This use is in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty					

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3539720				

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.6	

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[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	average = 10.7 to 18.0 mg/m3
Type of Measurement or Method:	8hr TWA
Worker Activity:	manual vessel and fittings cleaning
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Well described methods
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	This use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2006
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.6	

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	8hr TWA
Worker Activity:	bottling and shipping department
Type of Sampling:	area

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		High		1.6	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.9 to 2.8 mg/m3
Number of Samples:	3.0
Type of Measurement or Method:	8hr TWA
Worker Activity:	Bottling/shipping worker
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Well described methods
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	This use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2006
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	2.3 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	8hr TWA
Worker Activity:	Bottling/shipping - Maintenance and cleaning
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	5.9 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	short-term peak
Worker Activity:	Bottling/shipping - Maintenance and cleaning
Type of Sampling:	personal
Exposure Duration:	42 mins

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	3.4 to 6.6 mg/m3
Number of Samples:	2.0
Type of Measurement or Method:	8hr TWA
Worker Activity:	production - stirrer cleaning
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	18.7 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	short-term peak
Worker Activity:	production - stirrer cleaning
Type of Sampling:	personal
Exposure Duration:	19

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	3539720	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	15.5 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	8hr TWA
Worker Activity:	production - vessel cleaning
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Well described methods
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	This use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2006
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.6	

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[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	85 mg/m3
Number of Samples:	1.0
Type of Measurement or Method:	short-term peak
Worker Activity:	production - vessel cleaning
Type of Sampling:	personal
Exposure Duration:	5 min

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	This use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		High		1.6	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Meier, S., Schindler, B. K., Koslitz, S., Koch, H. M., Weiss, T., Käfferlein, H. U., Brüning, T.. 2013. Biomonitoring of exposure to N-methyl-2-pyrrolidone in workers of the automobile industry. Annals of Occupational Hygiene.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3539921

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Spray application of paint in the automotive industry
Physical Form:	liquid, vapor
Route of Exposure:	dermal, inhalation
Worker Activity:	Preparing the lacquers; Loading the spraying system; After drying the panels in an enclosed area within the spraying chamber, the panels were finally released back into the open workspace. There, the panels were wiped off, detached, and packed into boxes. Irregular activities included disassembling and manually cleaning the nozzles, screws, nuts, and bolts of the sprayers because the sprayers can get clogged. The cleaning process included the use of pure solvent mixtures containing up to 100 per-cent NMP.
Number of Workers:	14 (10 of 14 workers were wipers/packers of dried parts and were not regularly exposed to NMP; 2 of 14 were cleaners of spraying parts and had the highest concentration)
PPE:	Workers were required to wear thin solvent-resistant gloves made out of laminate. The gloves were used either alone or inside a second pair of gloves made out of polychloroprene or nitrile, which helped improve the grip. All gloves were discarded after a single use. Workers were also able to voluntarily use filter masks or as needed.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	High	× 2	2	in scope

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Source Citation:	Meier, S.,Schindler, B. K.,Koslitz, S.,Koch, H. M.,Weiss, T.,Käfferlein, H. U.,Brüning, T.. 2013. Biomonitoring of exposure to N-methyl-2-pyrrolidone in workers of the automobile industry. Annals of Occupational Hygiene.					
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;					
Hero ID	3539921					

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	2012
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Xiaofei, E., Wada, Y., Nozaki, J., Miyauchi, H.,Tanaka, S., Seki, Y., Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3562767

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing optical lenses
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range = 0.09 to 0.69 ppm
Number of Samples:	20.0
Number of Sites:	1.0
Type of Measurement or Method:	full shift 12-hr TWA
Worker Activity:	all activities during a day
Number of Workers:	4
Type of Sampling:	personal
Exposure Duration:	12 hr/dy
Exposure Frequency:	5 dy/wk

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Japan
Metric 3:	Applicability	High	× 2	2	Degreasing is in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks description of all worker activities

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Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.			
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3562767				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty.
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3562767

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing metal parts
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range = 0.04 to 0.59 ppm
Number of Samples:	8.0
Number of Sites:	1.0
Type of Measurement or Method:	full shift 12-hr TWA
Worker Activity:	all activities during a day
Number of Workers:	8
Type of Sampling:	personal
Exposure Duration:	12 hr/dy
Exposure Frequency:	5 dy/wk

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Well described methods
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Japan
	Metric 3:	Applicability	High	× 2	2	Degreasing is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks description of all worker activities

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Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3562767

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty.
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing
Life Cycle Description (Subcategory of Use):	Manufacturing
Worker Activity:	Exposure may arise from sampling, technical maintenance and cleaning
PPE:	LEV and gloves (APF 5, 80 percent)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	formulation
Worker Activity:	Tasks include liquid transfer operations to and from bulk storage/ IBCs (intermediate bulk containers)/drums/smaller containers, mixing in batch or continuous operations, sampling and analysis, storage and cleaning and maintenance operations
Number of Workers:	160,000 (coating), 98,000 (cleaning)
PPE:	LEV and Respiratory Protective Equipment (RPE) are employed and protective clothing is used

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	chemical production aid
Worker Activity:	Exposure may arise from sampling, technical maintenance and cleaning
PPE:	LEV and gloves (APF 5, 80 percent)

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coating application
Worker Activity:	Tasks include liquid transfer operations to and from bulk storage/IBCs/ drums/smaller containers, mixing in batch or continuous operations, preparation for application, application by spraying, brushing, roller, and dipping/immersion, film formation or within a fluidized bed system, sampling and analysis, storage and cleaning and maintenance operations.
PPE:	Protective clothing, gloves and RPE

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Cleaning
Worker Activity:	Activities arising from the use of cleaning products containing NMP that could give rise to exposure include transfer from storage, pouring/ unloading from drums or containers, mixing/diluting prior to use, cleaning activities (spraying, brushing, dipping,) and associated cleaning and maintenance of equipment.
Number of Workers:	3,400,000 (prof cleaning), 43,000 (optical cleaning), 1,080,000 (furniture cleaning), 662,000 (paint and glaze removal?)
PPE:	LEV and gloves (with training; APF20 95 percent)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	$\times$ 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	$\times$ 1	3	Europe
	Metric 3: Applicability	High	$\times$ 2	2	in scope
	Metric 4: Temporal Representativeness	High	$\times$ 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	$\times$ 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	$\times$ 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.3	

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Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	any stage with closed-system transfers
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.04 to 12.39 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	closed-system transfers. Table B65
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing
Life Cycle Description (Subcategory of Use):	any stage with closed-system transfers
Physical Form:	liquid, 100 percent
Route of Exposure:	dermal
Exposure Concentration (Unit):	0.03 to 1.37 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	closed-system transfers. Table B65
Exposure Duration:	8 hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	Europe
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2013
	Metric 5:	Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	any stage with manual transfers
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	3.10 to 17.35 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	Charging and discharging, including scenarios with elevated temperature. Table B66
Exposure Duration:	1 to 8 hrs

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	any stage with manual transfers
Physical Form:	liquid, 100 percent
Route of Exposure:	dermal
Exposure Concentration (Unit):	0.34 to 2.74 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	Charging and discharging, including scenarios with elevated temperature. Table B66
Exposure Duration:	1 to 8 hrs

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	formulation
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.04 to 20.65 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	mixing and blending
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	formulation
Physical Form:	liquid, 100 percent
Route of Exposure:	dermal
Exposure Concentration (Unit):	0.69 to 2.74 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Worker Activity:	mixing and blending
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	adhesive formulation
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	same data as source 3539720
Type of Measurement or Method:	Measured

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	This use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2006
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks certain metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.6	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of substrate (coating, cleaner, etc.)
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	7.96 to 18.70 mg/m3
Type of Measurement or Method:	Modelled using Stoffenmanager and RISKOFDERM
Exposure Duration:	4 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.2	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of substrate (coating, cleaner, etc.)
Route of Exposure:	dermal
Exposure Concentration (Unit):	1.73 to 3.46 mg/kg bw/day
Type of Measurement or Method:	Modelled using Stoffenmanager and RISKOFDERM
Exposure Duration:	4 hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	Europe
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2013
	Metric 5:	Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	roll /brush application of substrate (coating, cleaner, etc.)
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	4.13 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	roll /brush application of substrate (coating, cleaner, etc.)
Route of Exposure:	dermal
Exposure Concentration (Unit):	5.49 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	dip application of substrate (coating, cleaner, etc.)
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	4.13 to 12.40 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	4 to 8 hr/day

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	dip application of substrate (coating, cleaner, etc.)
Route of Exposure:	dermal
Exposure Concentration (Unit):	1.64 to 2.74 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	4 to 8 hr/day

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	screen printing plant
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	7.1 to 22.2 mg/m"
Number of Samples:	unknown
Number of Sites:	1.0
Type of Measurement or Method:	unknown
Worker Activity:	unknown
Type of Sampling:	unknown
Exposure Duration:	unknown

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	1988 - so different as to make outdated information unacceptable
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.1.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 64 mg/m3
Number of Samples:	unknown
Type of Measurement or Method:	8-hr TWA
Worker Activity:	unknown
Type of Sampling:	personal?
Exposure Duration:	8 hr
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Medium	× 1	2	some statistics unknown
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.6	

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Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	280 mg/m3
Number of Samples:	unknown
Type of Measurement or Method:	1-hr peak
Worker Activity:	unknown
Type of Sampling:	personal?
Exposure Duration:	1 hr
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Medium	× 1	2	some statistics unknown
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.6	

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	10 mg/m3
Number of Samples:	unknown
Type of Measurement or Method:	8-hr TWA
Worker Activity:	unknown
Type of Sampling:	personal
Exposure Duration:	8 hr
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Medium	× 1	2	some statistics unknown
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]			High		1.6	

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.82 to 4.1 mg/m3
Number of Samples:	unknown
Type of Measurement or Method:	unknown
Worker Activity:	unknown
Type of Sampling:	unknown
Exposure Duration:	unknown
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2004
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			Medium		1.7	

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Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	all
Life Cycle Description (Subcategory of Use):	tank cleaning
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	4.1 to 12.4 mg/m3
Number of Samples:	unknown
Type of Measurement or Method:	unknown
Worker Activity:	unknown
Type of Sampling:	unknown
Exposure Duration:	unknown

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2011
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning of instruments
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	same data as 735269
Type of Measurement or Method:	Measured

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Japan
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2009
	Metric 5: Sample Size	Medium	× 1	2	some statistics unknown
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	polymer
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	air concentrations exceeding the DNEL of 5 mg/m3 by approximately 5-fold
Number of Samples:	unknown
Type of Measurement or Method:	Measured
Worker Activity:	during preparation and initiating of the production pr
Type of Sampling:	both
Exposure Duration:	unknown

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2005
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]			Medium		1.7	

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Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	lab
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	2.07 - 4.13 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	lab
Route of Exposure:	dermal
Exposure Concentration (Unit):	0.34 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	$\times$ 1	1	Information from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	$\times$ 1	3	Europe
Metric 3:	Applicability	High	$\times$ 2	2	in scope
Metric 4:	Temporal Representativeness	High	$\times$ 2	2	2013
Metric 5:	Sample Size	High	$\times$ 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	$\times$ 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	$\times$ 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	lubrication and grease application
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	8.26 - 15.49 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Europe
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2013
Metric 5:	Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	lubrication and grease application
Route of Exposure:	dermal
Exposure Concentration (Unit):	2.74 to 5.49 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Spray application of agrichemicals
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	2.97 to 5.27 mg/m3
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Europe
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2013
Metric 5:	Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Spray application of agrichemicals
Route of Exposure:	dermal
Exposure Concentration (Unit):	2.21 to 5.38 mg/kg bw/day
Type of Measurement or Method:	Modelled using EasyTRA
Exposure Duration:	8 hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Route of Exposure:	dermal
Exposure Concentration (Unit):	Input parameters are defaults as given in ECHA guidance (chapter R14 Occupational exposure estimation).
Type of Measurement or Method:	Modelled using EasyTRA

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	Multiple data points provided with necessary metadata
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]		High		1.2	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Who,. 2001. Concise International Chemical Assessment Document 35: N-Methyl-2-Pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3809476

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 10 mg/m3
Type of Measurement or Method:	8-hr TWA
Type of Sampling:	personal
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4: Temporal Representativeness	Low	× 2	6	1993-2000
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Who,. 2001. Concise International Chemical Assessment Document 35: N-Methyl-2-Pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3809476

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	microelectronic industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 6 mg/m3
Type of Measurement or Method:	8-hr TWA
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	Medium	× 2	4	Not fully specified; could be cleaning in electronics industry
	Metric 4:	Temporal Representativeness	Low	× 2	6	1991
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks worker activities
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†			Low		2.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Who,. 2001. Concise International Chemical Assessment Document 35: N-Methyl-2-Pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3809476

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	microelectronic industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 280 mg/m3 (temperature of 80"C)
Type of Measurement or Method:	full-shift
Type of Sampling:	area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could be cleaning in electronics industry
	Metric 4: Temporal Representativeness	Low	× 2	6	1991
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks worker activities
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		Low		2.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Who,. 2001. Concise International Chemical Assessment Document 35: N-Methyl-2-Pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3809476

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 64 mg/m3
Type of Measurement or Method:	8-hr TWA
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2000
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Lacks worker activities
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination[†]		Medium		2.2	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Who,. 2001. Concise International Chemical Assessment Document 35: N-Methyl-2-Pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3809476

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	280 mg/m3
Type of Measurement or Method:	1-hr peak

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks worker activities
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1998. Environmental profile for N-methylpyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	photoresist remover
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	typical: 0.02 to 1.5 ppm
Worker Activity:	Industrial hygiene evaluations were performed in the die-coat application areas, in the NMP cleaning rooms, and in rooftop stack exhausts.
Type of Sampling:	area

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1991
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Lacks sample duration, exposure duration, frequency, and worker activities
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	does not address variability or uncertainty.
Overall Quality Determination†			Low		2.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	liquid
Route of Exposure:	dermal
Type of Measurement or Method:	PBPK modelling
Worker Activity:	skin surface contact = 445 (low-end), 668 (mid), and 890 (high-end) cm2; body weight = 74 kg
Number of Workers:	Total <230,000 workers. There were no risks to nearby worker non-users.
Exposure Duration:	Assumed durations of 1-hr, 4-hrs, and 8-hrs
Exposure Frequency:	Acute scenarios assumed 1 day of exposure and chronic scenarios assumed 5 days of exposure per week
PPE:	EPA considered the impact of different combinations of PPE including: respirator and gloves, respirator only, gloves only, and neither respirator nor gloves.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2015
Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7:　Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
　High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	liquid
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	1.0 (low-end), 32.5 (mid), 64 (high-end) mg/m3
Type of Measurement or Method:	8-hr TWA
Worker Activity:	Miscellaneous stripping (assumed mostly indoor)
Number of Workers:	Total <230,000 workers. Professional contractors (likely to include bathtub refinishing): 5 workers/facility; Automotive refinishing: 6 workers/facility; Furniture refinishing: 3 workers/facility; Art restoration and conservation (not estimated); Aircraft paint stripping: 320 workers/facility (for aircraft manufacturing only); Ship paint stripping: 100 workers/facility. There were no risks to nearby worker non-users.
Exposure Duration:	Assumed durations of 1-hr, 4-hrs, and 8-hrs
Exposure Frequency:	Acute scenarios assumed 1 day of exposure and chronic scenarios assumed 5 days of exposure per week
PPE:	EPA considered the impact of different combinations of PPE including: respirator and gloves, respirator only, gloves only, and neither respirator nor gloves.

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2015

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).				
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;				
Hero ID	3827504				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 5: Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	liquid
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.03 (low-end), 1.01 (mid), 4.52 (high-end) mg/m3
Type of Measurement or Method:	8-hr TWA
Worker Activity:	Graffiti removal (assumed mostly outdoor but may include semi-confined spaces)
Number of Workers:	Total <230,000 workers. 8 workers/facility. There were no risks to nearby worker non-users.
Exposure Duration:	Assumed durations of 1-hr, 4-hrs, and 8-hrs
Exposure Frequency:	Acute scenarios assumed 1 day of exposure and chronic scenarios assumed 5 days of exposure per week
PPE:	EPA considered the impact of different combinations of PPE including: respirator and gloves, respirator only, gloves only, and neither respirator nor gloves.

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4:	Temporal Representativeness	High	× 2	2	2015
	Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.

Continued on next page

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	liquid
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.01 to 280 mg/m3
Type of Measurement or Method:	measured - see Table Apx D-9
Worker Activity:	during stripping - see Table Apx D-9
Type of Sampling:	personal
Exposure Duration:	43 to 167 mins

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	$\times$ 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	$\times$ 1	1	US
	Metric 3: Applicability	High	$\times$ 2	2	in scope
	Metric 4: Temporal Representativeness	High	$\times$ 2	2	2015
	Metric 5: Sample Size	High	$\times$ 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	$\times$ 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	$\times$ 1	1	well characterized
Overall Quality Determination†		High		1.0	

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Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	liquid
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	64 mg/m3
Type of Measurement or Method:	8-hr TWA
Worker Activity:	during stripping - see Table Apx D-9
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2015
Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

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* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	liquid
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.56 to 1.78 mg/m3
Type of Measurement or Method:	8-hr TWA
Worker Activity:	during graffiti removal - see Table Apx D-9
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4:	Temporal Representativeness	High	× 2	2	2015
	Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination[†]			High		1.0	

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Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range: 0.01 to 24.61Geometric mean: 1.97Mean: 4.71Standard deviation: 6.17
Type of Measurement or Method:	15-min short term sample
Worker Activity:	during graffiti removal - see Table Apx D-9
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4:	Temporal Representativeness	High	× 2	2	2015
	Metric 5:	Sample Size	High	× 1	1	Statistical distribution of samples is fully characterized. Sample size is sufficiently representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. PubChem: 1-Methyl-2-pyrrolidinone.	
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3860487	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Number of Workers:	85169 workers estimated to be exposed to NMP in US at workplaces where NMP is produced or used

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	From NIOSH
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could include out of scope stages
	Metric 4: Temporal Representativeness	Low	× 2	6	1983
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No metadata, but still can be applied
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		2.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Worker Activity:	all workers potentially exposed
Number of Workers:	85,169 workers

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	From NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Medium	× 2	4	Not fully specified; could include out of scope stages
Metric 4:	Temporal Representativeness	Low	× 2	6	1983
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No metadata, but still can be applied
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		2.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Wood preservative
Exposure Concentration (Unit):	142 ug/m3
Type of Sampling:	area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1997
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		Low		2.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;
Hero ID	3969286

EXTRACTION

Parameter	Data
Life Cycle Stage:	Consumer Use
Life Cycle Description (Subcategory of Use):	Coatings
Physical Form:	liquid
Route of Exposure:	dermal
Type of Measurement or Method:	Floor lacquer A = 108 cm2Writing A = 1 cm2

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	the model makes assumptions or uses parameter values that lead to significant uncertainties
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia
Metric 3:	Applicability	Low	× 2	6	non-occupational scenario that is similar to an occupational scenario
Metric 4:	Temporal Representativeness	High	× 2	2	2016
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Model approach, equations, and choice of parameter values are transparent. However, rationale not fully described.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.	
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;	
Hero ID	3969286	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Consumer Use
Life Cycle Description (Subcategory of Use):	Cleaning
Physical Form:	liquid
Route of Exposure:	dermal
Type of Measurement or Method:	Spot removal = 230 cm2Paint remover = 430 cm2Sealant /foam remover A = 5 cm2

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	the model makes assumptions or uses parameter values that lead to significant uncertainties
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	Low	× 2	6	non-occupational scenario that is similar to an occupational scenario
	Metric 4: Temporal Representativeness	High	× 2	2	2016
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Model approach, equations, and choice of parameter values are transparent. However, rationale not fully described.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		Medium		2.0	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;
Hero ID	3969286

EXTRACTION

Parameter	Data
Life Cycle Stage:	Consumer Use
Life Cycle Description (Subcategory of Use):	Ink
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Assumed negligible due to small volume of use

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	the model makes assumptions or uses parameter values that lead to significant uncertainties
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia
Metric 3:	Applicability	Low	× 2	6	non-occupational scenario that is similar to an occupational scenario
Metric 4:	Temporal Representativeness	High	× 2	2	2016
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Model approach, equations, and choice of parameter values are transparent. However, rationale not fully described.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		Medium		2.0	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;
Hero ID	3969286

EXTRACTION

Parameter	Data
Life Cycle Stage:	Consumer Use
Life Cycle Description (Subcategory of Use):	Coating and cleaning
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	mean concentration ranged 54.3 to 217 mg/m3 for products containing 50 and 25 percent of NMP; 10.4 to 113 mg/m3 for 5 percent NMP; and 0.623 to 12.9 for mg/m3 for 0.3 percent NMP
Type of Measurement or Method:	Modeled based on saturation and parameters in Table 5 (ventilation, time)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	the model makes assumptions or uses parameter values that lead to significant uncertainties
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	Low	× 2	6	non-occupational scenario that is similar to an occupational scenario
	Metric 4:	Temporal Representativeness	High	× 2	2	2016
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Model approach, equations, and choice of parameter values are transparent. However, rationale not fully described.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized

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Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;
Hero ID	3969286

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 2014. Health hazard evaluation report no. HHE-2011-0099-3211, evaluation of employee exposures during sea lamprey pesticide application.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974909

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Agricultural products
Worker Activity:	Mixing pesticides with water prior to application; application; lab analyses to measure concentration upon application
Number of Workers:	38 employees
Exposure Frequency:	10-day periods throughout the season (April to October)
PPE:	Eye protection (safety glasses, goggles, or face shield) and chemical resistant gloves when mixing and applying pesticide. NIOSH-approved full facepiece dual cartridge (particulate and organic vapor) respirator when using the Bayluscide wettable powder and Bayluscide granular.

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources (NIOSH HHE)
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Agricultural use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2014
	Metric 5:	Sample Size	High	× 1	1	Sample size is sufficiently representative. Results are from interviewing of 20 employees.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	The report addresses variability and uncertainty in the results.

Continued on next page

Source Citation:	Niosh,. 2014. Health hazard evaluation report no. HHE-2011-0099-3211, evaluation of employee exposures during sea lamprey pesticide application.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3974909				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		High		1.0	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha,. 2010. Input received through web forum for identifying hazardous chemicals for which OSHA should develop exposure reduction strategies.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3978176				

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	Source was listed for exposure data, but only contained exposure limits. No data extracted

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	No information relevant to assessed conditions of use
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha,. 2017. Sampling and analytical methods: N-methyl-2-pyrrolidinone.			
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;			
Hero ID	3978312			

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	Source was listed for exposure data, but only contained exposure limits. No data extracted

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	No information relevant to assessed conditions of use
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 1.9.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Formulation
Life Cycle Description (Subcategory of Use):	polymeric adhesive for leather coating application
Physical Form:	liquid, 5 percent
Route of Exposure:	dermal
Worker Activity:	Transferring and adding primal Binder U-51 and other components into the mixing vessel.
Number of Workers:	2-3 /site
Exposure Duration:	4-6 hours/day
Exposure Frequency:	100 days/year
Engineering Control & percent Exposure Reduction:	Exhaust ventilation systems are installed in the mixing room.
PPE:	Safety glasses, impervious gloves. Overalls and safety boots

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	Adhesive formulation is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
	Metric 5:	Sample Size	Low	× 1	3	Distribution of samples is qualitative
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of polymeric adhesive for leather coating application
Physical Form:	liquid, 5 percent
Route of Exposure:	dermal, inhalation
Worker Activity:	Transferring basecoat and operating spray machines. Placing substrates on conveyor line.
Number of Workers:	2-3 /site
Exposure Duration:	6-8 hours/day
Exposure Frequency:	100 days/year
Engineering Control & percent Exposure Reduction:	Enclosed rotary spray unit. An exhaust ventilation system is present above the spray machines and any overspray is filtered and caught in a water curtain filtering system.
PPE:	Safety glasses, impervious gloves. Overalls and safety boots

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	Adhesive use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
	Metric 5:	Sample Size	Low	× 1	3	Distribution of samples is qualitative
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty						

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3978357				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Distribution polymeric adhesive for leather coating application
Physical Form:	liquid, 5 percent
Route of Exposure:	dermal
Worker Activity:	Load/unload drums from trucks. No exposure anticipated except in the event of an accident.
Number of Workers:	5 Waterside, workers, 5-10 transport and warehouse workers

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	Distribution is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
	Metric 5:	Sample Size	Low	× 1	3	Distribution of samples is qualitative
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1990. Technical information: N-methylpyrrolidone handling and storage.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982070

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	recommended PPE
PPE:	Chemical splash goggles should be worn. Gloves of butyl rubber and FEP Teflon provide the best resistance to NMP. Gloves should be rinsed following use and discarded. Butyl rubber aprons may be used for splash protection, however, the PVC coatings' found on much protective clothing rapidly dissolve in NMP.

EVALUATION

Domain	Metric		Rating	MWF[*]	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	$\times$ 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	$\times$ 1	1	US
	Metric 3:	Applicability	Medium	$\times$ 2	4	Information is not related to a life cycle stage, but is broadly applicable
	Metric 4:	Temporal Representativeness	Low	$\times$ 2	6	1990
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	$\times$ 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]			Low		2.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3982074

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	immersion degreasing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	average = 0.31 ppm
Worker Activity:	collection tube was located 5.0 feet away from the front lip of the degreaser top (exhaust hood was located at back lip of degreaser top) and 3.0 feet off of the floor
Type of Sampling:	area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Cleaning is included in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	1993
Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	provides results, but the underlying methods, data sources, and assumptions are not fully transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination[†]		Low		2.3	

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3982074

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.			
Type of Data Source	Occupational Exposure; Monitoring Data;			
Hero ID	3982074			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	immersion degreasing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	average = 1.84 ppm
Worker Activity:	Collection tube was taped into place on the workers shirt
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Cleaning is included in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1993
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	provides results, but the underlying methods, data sources, and assumptions are not fully transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination†		Low		2.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oehha,. 2007. Occupational health hazard risk assessment project for California: Identification of chemicals of concern, possible risk assessment methods, and examples of health protective occupational air concentrations.	
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;	
Hero ID	3982225	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.4 to 5 ppm
Type of Measurement or Method:	modelled using interspecies uncertainty factors
Worker Activity:	Workers were assumed to breathe 10 m3 out of a daily breathing rate of 20 m3/day, and be exposed at the PEL for 5 days per week.
Exposure Duration:	8 hrs
Exposure Frequency:	5 days/wk

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Seems sound, but utilizes animal studies to derive human values
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	can be appropriately applied
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2007
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Model approach, equations, and choice of parameter values are transparent and clear and can be evaluated. Rationale for selection of approach, equations, and parameter values is provided.
Domain 4: Variability and Uncertainty						

Continued on next page

Source Citation:	Oehha,. 2007. Occupational health hazard risk assessment project for California: Identification of chemicals of concern, possible risk assessment methods, and examples of health protective occupational air concentrations.				
Type of Data Source	Occupational Exposure; Published Models for Exposures or Releases;				
Hero ID	3982225				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	The model characterizes variability and uncertainty in the results.
Overall Quality Determination†		High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Hesis,. 2014. N-methylpyrrolidone (nmp): Health hazard advisory: Fact sheet.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982238

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	all
Type of Measurement or Method:	This document lists health effects and suggested PPE.
PPE:	Half-face respirator with organic vapor cartridges. In spraying operations, this should be combined with a mist pre-filter. Wear chemical protective utility gloves such as butyl rubber or Silvershield" (laminated polyethylene/EVOH). NMP will go right through less durable gloves such as those made of natural rubber, nitrile, or polyethylene. Replace gloves often. Use chemical protective clothing such as aprons, sleeves, boots, and head and face protection if NMP can contact your skin at areas other than your hands.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	CalOSHA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	PPE suggestions applicable to in-scope uses
	Metric 4: Temporal Representativeness	High	× 2	2	2014
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	Hesis,. 2014. N-methylpyrrolidone (nmp): Health haazard advisory: Fact sheet.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982238

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		High		1.3	

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	3982353	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 10 mg/m3
Type of Sampling:	personal
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	High	× 2	2	in scope with paint stripping?
	Metric 4: Temporal Representativeness	Low	× 2	6	1993-2000
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.		
Type of Data Source	Occupational Exposure; Monitoring Data;		
Hero ID	3982353		

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	microelectronic industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 6 mg/m3 (reg temp); up to 280 mg/m3 (temperature of 80"C)
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could be cleaning in electronics industry
	Metric 4: Temporal Representativeness	Low	× 2	6	1991
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but no other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3982353

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 64 mg/m3; peak 280 mg/m3
Type of Sampling:	personal
Analytic Method:	note: in paint stripper RA

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	unknown
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but no other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†			Medium		2.2	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3982353				

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Physical Form:	vapor
Route of Exposure:	dermal
Exposure Concentration (Unit):	30 percent of the total inhalation dose
Type of Measurement or Method:	experimental study in human volunteers

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could be applied to in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2007
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No metadata, but still can be applied
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3982353

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Route of Exposure:	dermal
Exposure Concentration (Unit):	15 minutes exposure to 15 percent aqueous NMP is equivalent to inhalation of 10 mg/m3 NMP with respect to absorption

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could be applied to in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2002
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No metadata, but still can be applied
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec,. 2007. Recommendation from the scientific committee on occupational exposure limits for n-methyl-2-pyrrolidone.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3982353

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Route of Exposure:	dermal
Exposure Concentration (Unit):	permeability rate through human skin of $171 + 59$ g/m3 has been derived for NMP

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	unknown
	Metric 3: Applicability	Medium	× 2	4	Not fully specified; could be applied to in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1995
	Metric 5: Sample Size	Low	× 1	3	characterized by no statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No metadata, but still can be applied
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Low		2.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2013. OPPT N-Methylpyrrolidone (NMP) draft risk assessment final comments of nine member peer review panel December 31, 2013.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986611				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripping
Type of Measurement or Method:	This source is a review of EPA's Draft Paint Stripping RA. It lists modelling considerations.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	The assessment or report uses high quality data and/or techniques that are not from trusted sources; however, Associated information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion of the variability and uncertainty in the results
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Thomas, T. 2017. Comment submitted by Todd Thomas, ELANTAS PDG, Inc. (EPDG).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986789

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing /Use
Life Cycle Description (Subcategory of Use):	Polymers and Electronics (wires)
Number of Workers:	5 to 10
Engineering Control & percent Exposure Reduction:	NMP is used in the following process conditions: Enclosed process vessels with emissions sent to an RTO; includes manufacturing and cleaning operations; Small enclosed process vessel (<30 gallons); emissions are fugitive; Filling operations into drums, IBC"s and tank wagons; emissions are fugitive; Bulk and container storage operations; Regulated metal parts washers; emissions are fugitive

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†			High		1.1	

Source Citation:	Thomas, T. 2017. Comment submitted by Todd Thomas, ELANTAS PDG, Inc. (EPDG).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986789

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics - Photoresist Stripping
Engineering Control & percent Exposure Reduction:	Closed conveyorized equipment or tank with exhaust ventilation; Ventilation within the process enclosures are used to maintain proper workplace exposure levels.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†			High		1.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics - Soldermask Stripping
Engineering Control & percent Exposure Reduction:	open topped tankequipped with ventilation
PPE:	Worker exposure is controlled via ventilation and use of appropriate PPE.

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†		High		1.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Engineering Control & percent Exposure Reduction:	closed reaction system; local ventilation
PPE:	personnel are equipped with PPE

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Fertilizer application
Engineering Control & percent Exposure Reduction:	closed system tank mixer in a continuous process
PPE:	PPE, respirators

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination[†]		High		1.1	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986801

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - semiconductor manufacturing
Engineering Control & percent Exposure Reduction:	The wafer fabrication activities listed in this table would normally be conducted within robotically operated enclosed tools, where engineering controls (chamber containment) provide exposure control during normal operations. List of specific controls on page 10.
PPE:	Unspecified PPE

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Trade association poll of manufacturers. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination[†]			High		1.1	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	National Electrical Manufacturers Association. 2017. Comment submitted by National Electrical Manufacturers Association (NEMA).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986803

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - magnet wires
Engineering Control & percent Exposure Reduction:	the polymer applicator and curing oven are completely enclosed; process is completely enclosed and ventilated.
PPE:	gloves, aprons and goggles as well as engineering controls

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†		High		1.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours, Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMIT-TING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4214100	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.005 ppm (mean)0.2 ppm (max)
Number of Samples:	21.0
Number of Sites:	1.0
Worker Activity:	Organic polymer prep and solvent recovery
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	Medium	× 1	2	Characterized by a range
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.1	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 ppm, 1 ppm
Number of Samples:	2.0
Number of Sites:	1.0
Worker Activity:	Manufacture of composite prepreg
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	6 ppm, 1 ppm
Number of Samples:	2.0
Number of Sites:	1.0
Worker Activity:	Resin heating mill hood
Type of Sampling:	area

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints and Coatings application
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.13 ppm (mean)0.2 (max)
Number of Samples:	3.0
Number of Sites:	1.0
Worker Activity:	Equipment clean up in paint shop
Type of Sampling:	personal
Sampling Location:	paint shop

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Use in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	Medium	× 1	2	Characterized by a range
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination[†]		Medium		2.1	

⋆ MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints and Coatings application
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	2.0 ppm (mean)3.0 ppm (max)
Number of Samples:	2.0
Number of Sites:	1.0
Worker Activity:	Solvent for spray application of roll coating
Type of Sampling:	personal
Exposure Frequency:	25 min
PPE:	Respiratory and skin protection worn

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Use in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	Medium	× 1	2	Characterized by a range
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†			Medium		2.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Curing composite article at 800 F
Type of Sampling:	personal
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMIT-TING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACH-MENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

⋆ MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Curing composite article at 800 F
Type of Sampling:	area
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		Medium		2.0	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Devolatilizing composite article in laboratory hood
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†			Medium		2.0	

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Devolatilizing composite article in ventilated press
Type of Sampling:	personal
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4214100	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Devolatilizing composite article in ventilated press
Type of Sampling:	area
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Processing in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1989
	Metric 5: Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Impregnating fibers with resin in laboratory hood
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†			Medium		2.0	

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMIT-TING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACH-MENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	2.0
Worker Activity:	Cut patterns from prepreg and devolatilized for 2 hours
Type of Sampling:	personal
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Cut patterns from prepreg and devotalized for 2 hours
Type of Sampling:	area
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	<0.1 ppm
Number of Samples:	1.0
Worker Activity:	Operator cut patterns from prepreg
Type of Sampling:	personal
PPE:	skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	5.2 ppm
Number of Samples:	1.0
Worker Activity:	Clean up of 310 F heater plates
Type of Sampling:	personal
Exposure Frequency:	9 min
PPE:	Respiratory and skin protection worn

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	3.7 ppm, 10 ppm
Number of Samples:	2.0
Worker Activity:	Clean up of 310 F heater plates
Type of Sampling:	personal
Exposure Frequency:	13 min
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMIT-TING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACH-MENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (polymer manufacturing)
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	12 ppm
Number of Samples:	1.0
Worker Activity:	Clean up of 310 F heater plates
Type of Sampling:	personal
Exposure Frequency:	17 min
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	High	× 1	1	Discrete data point provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	Monitoring data lacks sample durations and/or measurement method
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		2.0	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing
Life Cycle Description (Subcategory of Use):	Manufacturing
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	5 mg/day, avg breathing rate of 1.25 m3/hr
Number of Sites:	3.0
Type of Measurement or Method:	CEB drumming model
Worker Activity:	sampling and packaging
Number of Workers:	6 to 10 per site
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing
Life Cycle Description (Subcategory of Use):	Manufacturing
Physical Form:	liquid
Route of Exposure:	Dermal contact
Exposure Concentration (Unit):	1300 - 3900 mg/day
Number of Sites:	3.0
Type of Measurement or Method:	CEB two hand immersion model
Worker Activity:	sampling and packaging
Number of Workers:	6 to 10 per site
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (lube oil extraction)
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	>0.1 mg/day
Type of Measurement or Method:	CEB sampling model
Worker Activity:	Lube oil extraction
Number of Workers:	5999 - 17000
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination[†]			Medium		1.8	

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

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Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing Non-Incorporative (lube oil extraction)
Physical Form:	liquid
Route of Exposure:	Dermal contact
Exposure Concentration (Unit):	1300 - 3900 mg/day
Type of Measurement or Method:	CEB two hand immersion model
Worker Activity:	Lube oil extraction
Number of Workers:	6000 - 17000
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability
Overall Quality Determination†			Medium		1.8	

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint and coating removers
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	up to 16 mg/day
Type of Measurement or Method:	Manipulating current methylene chloride data by vapor pressures
Worker Activity:	Stripper applied to surface by spraying or brushing or dipping. Time given to penetrate. Stripper removed, wiped or scraped.
Number of Workers:	2,500-10,700
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint and coating removers
Physical Form:	liquid
Route of Exposure:	Dermal contact
Exposure Concentration (Unit):	400-975 mg/day
Type of Measurement or Method:	CEB two hand immersion model
Worker Activity:	Stripper applied to surface by spraying or brushing or dipping. Time given to penetrate. Stripper removed, wiped or scraped.
Number of Workers:	2,500-10,701
PPE:	Respiratory and skin protection worn

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion on uncertainty and variability

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Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing /Processing
Life Cycle Description (Subcategory of Use):	Chemical industry and mineral oil processing - likely formulation of solutions
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.175 (50th; below LOQ), 13.41 (90th), 16.93 (95th) mg/m3
Number of Samples:	11.0
Number of Sites:	6.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Potentially contains some scenarios that are out of scope. Contains some that are in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Plastics and plastic foam processing/mfg
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 3 (90th), 3.5 (95th) mg/m3
Number of Samples:	40.0
Number of Sites:	28.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Polymer processing is in scope, but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	stones, earth, ceramics, glass industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 0.68 (90th), 0.74 (95th) mg/m3
Number of Samples:	12.0
Number of Sites:	8.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Unacceptable	× 2	8	Not in scope, doesn't seem applicable to those scenarios in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Continued on next page

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Unacceptable		4	Metric Mean Score: 2.3.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg and processing of metals - processing of liquid coating materials
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 13.41 (90th), 24.65 (95th) mg/m3
Number of Samples:	43.0
Number of Sites:	27.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	Formulation of coating materials for metals
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).			
Type of Data Source	Occupational Exposure; Monitoring Data;			
Hero ID	4271620			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Steel construction, mfg of machinery and vehicles
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 5.02 (90th), 7.36 (95th) mg/m3
Number of Samples:	16.0
Number of Sites:	9.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Electrical, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 3.54 (90th), 6.2 (95th) mg/m3
Number of Samples:	44.0
Number of Sites:	33.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 1 (90th), 1.7 (95th) mg/m3
Number of Samples:	40.0
Number of Sites:	23.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Painting cars
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 0.5 (90th), 2.5 (95th) mg/m3
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Painting is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing /Processing
Life Cycle Description (Subcategory of Use):	Chemical industry and mineral oil processing - likely formulation of solutions
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.45 (50th; below LOQ), 6 (90th), 9.5 (95th) mg/m3
Number of Samples:	30.0
Number of Sites:	11.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Potentially contains some scenarios that are out of scope. Contains some that are in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Plastics and plastic foam processinc/mfg
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.35 (50th; below LOQ), 2.93 (90th), 4.985 (95th) mg/m3
Number of Samples:	61.0
Number of Sites:	35.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Polymer processing is in scope, but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg and processing of metals - processing of liquid coating materials
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.5 (50th), 2.72 (90th), 3 (95th) mg/m3
Number of Samples:	44.0
Number of Sites:	20.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Formulation of coating materials for metals
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		1.7	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Steel construction, mfg of machinery and vehicles
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 1.75 (90th), 2.725 (95th) mg/m3
Number of Samples:	15.0
Number of Sites:	12.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Electrical, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 9.6 (90th), 11.9 (95th) mg/m3
Number of Samples:	21.0
Number of Sites:	15.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 3.2 (90th), 12.8 (95th) mg/m3
Number of Samples:	39.0
Number of Sites:	19.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination[†]		Medium		1.9	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Building industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	1.5 (50th), 6.6 (90th), 7.9 (95th) mg/m3
Number of Samples:	11.0
Number of Sites:	7.0
Type of Measurement or Method:	TWA?
Type of Sampling:	personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacturing /Processing
Life Cycle Description (Subcategory of Use):	Chemical industry and mineral oil processing - likely formulation of solutions
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.45 (50th; below LOQ), 12.5 (90th), 16.8 (95th) mg/m3
Number of Samples:	30.0
Number of Sites:	11.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Potentially contains some scenarios that are out of scope. Contains some that are in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).		
Type of Data Source	Occupational Exposure; Monitoring Data;		
Hero ID	4271620		

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Plastics and plastic foam processinc/mfg
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.5 (50th), 3.45 (90th), 4.775 (95th) mg/m3
Number of Samples:	65.0
Number of Sites:	31.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	Medium	× 2	4	Polymer processing is in scope, but due to unknown operations considered in this industry, this may include out of scope scenarios
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	stones, earth, ceramics, glass industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 0.78 (90th), 0.92 (95th) mg/m3
Number of Samples:	12.0
Number of Sites:	9.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	Unacceptable	× 2	8	Not in scope, doesn't seem applicable to those scenarios in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.3.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg and processing of metals - processing of liquid coating materials
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.55 (50th; below LOQ), 4 (90th), 6.5 (95th) mg/m3
Number of Samples:	55.0
Number of Sites:	26.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Formulation of coating materials for metals
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination[†]		Medium		1.7	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Steel construction, mfg of machinery and vehicles
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.55 (50th; below LOQ), 5.8 (90th), 7.45 (95th) mg/m3
Number of Samples:	15.0
Number of Sites:	10.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Electrical, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 3 (90th), 3.9 (95th) mg/m3
Number of Samples:	40.0
Number of Sites:	25.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 1 (90th), 3.855 (95th) mg/m3
Number of Samples:	33.0
Number of Sites:	23.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 2.35 (90th), 3 (95th) mg/m3
Number of Samples:	45.0
Number of Sites:	22.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Plastics and plastic foam processinc/mfg
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 1.92 (90th), 2.9 (95th) mg/m3
Number of Samples:	22.0
Number of Sites:	14.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Polymer processing is in scope, but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg and processing of metals - processing of liquid coating materials
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 13.45 (90th), 86.9 (95th) mg/m3
Number of Samples:	19.0
Number of Sites:	12.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Formulation of coating materials for metals
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Steel construction, mfg of machinery and vehicles
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD
Number of Samples:	15.0
Number of Sites:	10.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Likely related to degreasing, which is in scope. but due to unknown operations considered in this industry, this may include out of scope scenarios
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 1.7 (90th), 1.74 (95th) mg/m3
Number of Samples:	33.0
Number of Sites:	23.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.045 (50th; below LOQ), 28 (90th), 34 (95th) mg/m3
Number of Samples:	45.0
Number of Sites:	22.0
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.64 (90th), 1.155 (95th) mg/m3
Number of Samples:	13.0
Number of Sites:	7.0
Type of Measurement or Method:	TWA?
Worker Activity:	storing, conveying
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	due to unknown industries for this activity, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing and treatment of wood
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 49.8 (90th), 149.8 (95th) mg/m3
Number of Samples:	24.0
Number of Sites:	9.0
Type of Measurement or Method:	TWA?
Worker Activity:	processing, sanding, removal
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Medium	× 2	4	Application of finishing to wood is in scope, but sanding and removal may not be
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 3 (90th), 5.35 (95th) mg/m3
Number of Samples:	82.0
Number of Sites:	55.0
Type of Measurement or Method:	TWA?
Worker Activity:	surface coating and painting
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metals, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.7 (50th), 15 (90th), 90 (95th) mg/m3
Number of Samples:	30.0
Number of Sites:	15.0
Type of Measurement or Method:	TWA?
Worker Activity:	cleaning
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Mfg of shoes; Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 3.76 (90th), 5.52 (95th) mg/m3
Number of Samples:	18.0
Number of Sites:	10.0
Type of Measurement or Method:	TWA?
Worker Activity:	gluing
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Adhesive use is in scope, but this may also include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Foundries
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 15.8 (90th), 21.1 (95th) mg/m3
Number of Samples:	11.0
Number of Sites:	5.0
Type of Measurement or Method:	TWA?
Type of Sampling:	area
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	Unacceptable	× 2	8	the function in this industry is unknown
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.3.

⋆⋆ Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg of coatings, adhesives
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.35 (50th; below LOQ), 3.45 (90th), 5.875 (95th) mg/m3
Number of Samples:	21.0
Number of Sites:	11.0
Type of Measurement or Method:	TWA?
Worker Activity:	mixing, pressing (compacting)
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	processing plastics and plastic
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.38 (90th; below LOQ), 0.49 (95th) mg/m3
Number of Samples:	11.0
Number of Sites:	6.0
Type of Measurement or Method:	TWA?
Worker Activity:	foaming
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Potentially in scope; function of NMP for plastics not well known
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing and treatment of wood
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.5 (50th), 8.4 (90th), 13.9 (95th) mg/m3
Number of Samples:	13.0
Number of Sites:	8.0
Type of Measurement or Method:	TWA?
Worker Activity:	sanding
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Application of finishing to wood is in scope, but sanding and removal may not be
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.65 (50th), 3 (90th), 4.865 (95th) mg/m3
Number of Samples:	69.0
Number of Sites:	39.0
Type of Measurement or Method:	TWA?
Worker Activity:	surface coating and painting
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metals, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	2 (50th), 12.35 (90th), 18.875 (95th) mg/m3
Number of Samples:	23.0
Number of Sites:	17.0
Type of Measurement or Method:	TWA?
Worker Activity:	cleaning
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Mfg of shoes; Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 1.94 (90th), 2.095 (95th) mg/m3
Number of Samples:	21
Number of Sites:	14
Type of Measurement or Method:	TWA?
Worker Activity:	gluing
Type of Sampling:	Personal
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Adhesive use is in scope, but this may also include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing and treatment of wood
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 5.72 (90th), 7.8 (95th) mg/m3
Number of Samples:	12
Number of Sites:	5
Type of Measurement or Method:	TWA?
Worker Activity:	sanding
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Application of finishing to wood is in scope, but sanding and removal may not be
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 3.24 (90th), 4.055 (95th) mg/m3
Number of Samples:	17
Number of Sites:	11
Type of Measurement or Method:	TWA?
Worker Activity:	surface coating and painting
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metals, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.4 (50th; below LOQ), 79.6 (90th), 102.1 (95th) mg/m3
Number of Samples:	11
Number of Sites:	6
Type of Measurement or Method:	TWA?
Worker Activity:	cleaning
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Mfg of shoes; Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.2 (90th; below LOQ), 0.245 (95th; below LOQ) mg/m3
Number of Samples:	11
Number of Sites:	7
Type of Measurement or Method:	TWA?
Worker Activity:	gluing
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken WITHOUT LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	Medium	× 2	4	Adhesive use is in scope, but this may also include out of scope scenarios
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

Continued on next page

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 (50th; below LOQ), 0.7 (90th), 1.35 (95th) mg/m3
Number of Samples:	10
Number of Sites:	4
Type of Measurement or Method:	TWA?
Worker Activity:	storing, conveying
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	due to unknown industries for this activity, this may include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Mfg of coatings, adhesives
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 3.45 (90th), 5.875 (95th) mg/m3
Number of Samples:	21
Number of Sites:	9
Type of Measurement or Method:	TWA?
Worker Activity:	mixing, pressing (compacting)
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	processing plastics and plastic
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.88 (90th), 1.84 (95th) mg/m3
Number of Samples:	13
Number of Sites:	7
Type of Measurement or Method:	TWA?
Worker Activity:	foaming
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	Potentially in scope; function of NMP for plastics not well known
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing and treatment of wood
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 1 (90th), 1 (95th) mg/m3
Number of Samples:	14
Number of Sites:	7
Type of Measurement or Method:	TWA?
Worker Activity:	sanding
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Application of finishing to wood is in scope, but sanding and removal may not be
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 (50th; below LOQ), 3.76 (90th), 5.46 (95th) mg/m3
Number of Samples:	108
Number of Sites:	68
Type of Measurement or Method:	TWA?
Worker Activity:	surface coating and painting
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metals, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.9 (50th), 10.85 (90th), 13.125 (95th) mg/m3
Number of Samples:	35
Number of Sites:	19
Type of Measurement or Method:	TWA?
Worker Activity:	cleaning
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

| Overall Quality Determination† | | Medium | | 1.7 | |

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Mfg of shoes; Processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.45 (50th; below LOQ), 4.28 (90th), 6.96 (95th) mg/m3
Number of Samples:	24
Number of Sites:	13
Type of Measurement or Method:	TWA?
Worker Activity:	gluing
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Adhesive use is in scope, but this may also include out of scope scenarios
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Foundries
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.6 (90th), 0.75 (95th) mg/m3
Type of Measurement or Method:	TWA?
Type of Sampling:	unknown
Exposure Duration:	sample time >=1hr; exposure duration >= 6hr
Engineering Control & percent Exposure Reduction:	samples taken in the presence of LEV

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Unacceptable	× 2	8	Not in scope, doesn"t seem applicable to those scenarios in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Unacceptable		4	Metric Mean Score: 2.3.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Painting - manufacture and processing of metals
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.7 (50th),3.86 (90th), 5.415 (95th) mg/m3
Number of Samples:	37
Number of Sites:	19
Type of Measurement or Method:	TWA
Worker Activity:	Industry listed as "manufacture and processing of metals." Work group area listed as "surface coating, painting." Unknown application type. Unknown area of sampling. No additional details are provided.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Cleaning - manufacture and processing of metals
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	1.5 (50th),57 (90th), 96.4 (95th) mg/m3
Number of Samples:	14
Number of Sites:	7
Type of Measurement or Method:	TWA
Worker Activity:	Industry listed as "manufacture and processing of metals." Work group area listed as "cleaning." Unknown application type. Unknown area of sampling. No additional details are provided.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 0.46 (90th), 0.95 (95th) mg/m3
Number of Samples:	22
Number of Sites:	16
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "woodworking, paper, printing".
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Medium	× 2	4	Printing is in scope. Woodworking and paper may be out of scope.
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.9	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Steel construction, manufacture of machinery and vehicles
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.7 (50th), 5.56 (90th), 7.36 (95th) mg/m3
Number of Samples:	16
Number of Sites:	9
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "Steel construction, manufacture of machinery and vehicles." Workgroup listed as :surface coating, painting."
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electrical engineering, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	below LOD (50th), 1.22 (90th), 1.965 (95th) mg/m3
Number of Samples:	21
Number of Sites:	11
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "surface coating, painting" within electrical engineering, fine mechanics, and optics manufacturing. Additional details are not provided.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	4271620	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electrical engineering, fine mechanics, optics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.95 (50th), 11.9 (90th), 12 (95th) mg/m3
Number of Samples:	21
Number of Sites:	8
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "cleaning" within electrical engineering, fine mechanics, and optics manufacturing. Additional details are not provided.
Type of Sampling:	unknown

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty					

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation - manufacture /processing of coatings, glue, adhesives
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.4 below LOD (50th), 4.5 (90th), 6.2 (95th) mg/m3
Number of Samples:	14
Number of Sites:	8
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "chemical industry and mineral processing," including manufacture /processing of coatings, glue, adhesives. Work area group listed as "mixing, pressing." These data are likely a subset of the above data.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture /processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.2 below LOD (50th), 0.84 (90th), 1.72 (95th) mg/m3
Number of Samples:	14
Number of Sites:	8
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "plastics and plastic foam, processing and manufacture; manufacture and processing of rubber products." Work area group listed as "Foaming." These data are likely a subset of the above data.
Type of Sampling:	unknown

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination[†]		Medium		1.7	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture /processing of plastic and plastic foam
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.3 below LOD (50th), 2 (90th), 2.6 (95th) mg/m3
Number of Samples:	28
Number of Sites:	13
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "plastics and plastic foam, processing and manufacture; manufacture and processing of rubber products." Work area group listed as "Surface coating, painting, coating." These data are likely a subset of the above data.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Gluing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.85 (50th), 6.15 (90th), 8.625 (95th) mg/m3
Number of Samples:	15
Number of Sites:	8
Type of Measurement or Method:	TWA
Worker Activity:	Work group area is listed as "Gluing." No additional details are provided.
Type of Sampling:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	Low	× 2	6	unknown if in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		2.1	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	50th percentile: below analytical quantification limit of 0.4290th percentile: 6.7695th percentile: 26
Number of Samples:	28
Number of Sites:	17
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "woodworking, paper, printing"
Type of Sampling:	area

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

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Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	4271620				

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	woodworking, paper, printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	50th percentile: below analytical quantification limit of 0.4290th percentile: 12.5695th percentile: 120.6
Number of Samples:	14
Number of Sites:	9
Type of Measurement or Method:	TWA
Worker Activity:	Listed as "woodworking, paper, printing"
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology not specified as NIOSH or OSHA, but seems acceptable.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2010
	Metric 5:	Sample Size	Medium	× 1	2	Distribution of samples is characterized by a range with uncertain statistics.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Monitoring data include sample type (e.g., personal breathing zone) but lack other metadata.
Domain 4: Variability and Uncertainty						

Source Citation:	IFA. 2010. MEGA evaluations for the preparation of REACH exposure scenarios for N-methyl-2-pyrrolidone (vapour).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	4271620

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study does not address variability or uncertainty
Overall Quality Determination†			Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of coating
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.04-5.2 mg/m3
Number of Samples:	unknown
Number of Sites:	1
Type of Measurement or Method:	unknown
Worker Activity:	workers inside spray booth
Type of Sampling:	personal
Exposure Duration:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1996
	Metric 5:	Sample Size	Medium	× 1	2	characterized by a range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]			High		1.6	

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of coating
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.04-0.62 mg/m3
Number of Samples:	unknown
Number of Sites:	1
Type of Measurement or Method:	unknown
Worker Activity:	workers outside spray booth
Type of Sampling:	personal
Exposure Duration:	unknown

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1996
	Metric 5: Sample Size	Medium	× 1	2	characterized by a range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.6	

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Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of coating
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	18.6 101 mg/m3
Number of Samples:	unknown
Number of Sites:	1
Type of Measurement or Method:	unknown
Worker Activity:	inside spray booth
Type of Sampling:	area
Exposure Duration:	unknown

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1996
	Metric 5:	Sample Size	Medium	× 1	2	characterized by a range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†			High		1.6	

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	spray application of coating
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.04-0.81 mg/m3
Number of Samples:	unknown
Number of Sites:	1
Type of Measurement or Method:	unknown
Worker Activity:	outside spray booth
Type of Sampling:	area
Exposure Duration:	unknown

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1996
	Metric 5: Sample Size	Medium	× 1	2	characterized by a range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination†		High		1.6	

Source Citation:	NIOSH. 1998. Health Hazard Evaluation Report No. HETA 9602662702, Cooper Engineered Products, Bowling Green, Ohio.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	4287129

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.0057- <0.083 ppm TWA: <0.0057 - <0.006 ppm
Number of Samples:	5
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Container change out: various sizes
Type of Sampling:	Personal
Exposure Duration:	2-20 minutes
Exposure Frequency:	55- gallon drum change outs can occur once every other week to 16 times in a 12-hour shift
Engineering Control & percent Exposure Reduction:	Typical chemical delivery systems are enclosed units equipped with local exhaust ventilation, leak detection, and exhaust monitoring with alarm to a central control room or personnel.
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; OSHA PV2043, SOP-5, GC-FID; mod. NIOSH 1302

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5161295				

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.0023 - <3 ppm TWA: <0.08 - <0.762 ppm
Number of Samples:	15
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Container change out: various sizes
Type of Sampling:	Personal
Exposure Duration:	2-20 minutes
Exposure Frequency:	55- gallon drum change outs can occur once every other week to 16 times in a 12-hour shift
Engineering Control & percent Exposure Reduction:	Typical chemical delivery systems are enclosed units equipped with local exhaust ventilation, leak detection, and exhaust monitoring with alarm to a central control room or personnel.
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; OSHA PV2043, SOP-5, GC-FID; mod. NIOSH 1302

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.2 - <0.39 ppm TWA: <0.011 - <0.19 ppm
Number of Samples:	12
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Container change out: various sizes
Type of Sampling:	Personal
Exposure Duration:	2-20 minutes
Exposure Frequency:	55- gallon drum change outs can occur once every other week to 16 times in a 12-hour shift
Engineering Control & percent Exposure Reduction:	Typical chemical delivery systems are enclosed units equipped with local exhaust ventilation, leak detection, and exhaust monitoring with alarm to a central control room or personnel.
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; OSHA PV2043, SOP-5, GC-FID; mod. NIOSH 1302

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.9 ppmTWA: <0.1 ppm
Number of Samples:	1
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Container changeout and waste handling: NOWPAK bladder removal prior to disposal.
Type of Sampling:	Personal
Exposure Duration:	2-20 minutes
Exposure Frequency:	55- gallon drum changeouts can occur once every other week to 16 times in a 12-hour shift
Engineering Control & percent Exposure Reduction:	Typical chemical delivery systems are enclosed units equipped with local exhaust ventilation, leak detection, and exhaust monitoring with alarm to a central control room or personnel.
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; OSHA PV2043, SOP-5, GC-FID; mod. NIOSH 1302

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.49 ppm TWA: <0.013 ppm
Number of Samples:	1
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Container change out and waste handling: Waste drum Disconnect, Removal, Handling (55 gal)
Type of Sampling:	Personal
Exposure Duration:	2-20 minutes
Exposure Frequency:	55- gallon drum change outs can occur once every other week to 16 times in a 12-hour shift
Engineering Control & percent Exposure Reduction:	Typical chemical delivery systems are enclosed units equipped with local exhaust ventilation, leak detection, and exhaust monitoring with alarm to a central control room or personnel.
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; OSHA PV2043, SOP-5, GC-FID; mod. NIOSH 1302

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.006 - <0.20 ppm TWA: <0.0057-<0.20 ppm
Number of Samples:	18
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Maintenance activities: Plate cleans, filter changes, tool PMs, tool cleaning, o-ring change out
Type of Sampling:	Personal
Exposure Duration:	The task takes from less than 12 minutes to less than or equal to 2 hours
Exposure Frequency:	Performed fewer than 1 time per month per tool
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5161295				

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.024 - 0.29 ppm TWA: <0.001-<0.13 ppm
Number of Samples:	12
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Maintenance activities
Type of Sampling:	Personal
Exposure Duration:	The task takes from less than 12 minutes to less than or equal to 2 hours
Exposure Frequency:	Performed fewer than 1 time per month per tool
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 2018

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5161295				

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.18 - <1 ppm TWA: <0.003 - <0.18
Number of Samples:	ppm 9
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Maintenance activities: Tool PMs and dip tube change out on chem delivery system
Type of Sampling:	Personal
Exposure Duration:	The task takes from less than 12 minutes to less than or equal to 2 hours
Exposure Frequency:	Performed fewer than 1 time per month per tool
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination[†]			High		1.0	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.2 - <1 ppm TWA: <0.0095 - <0.37
Number of Samples:	6
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Maintenance activities: wet station clean and parts clean using 100 percent NMP
Type of Sampling:	Personal
Exposure Duration:	The task takes from less than 12 minutes to less than or equal to 2 hours
Exposure Frequency:	Performed fewert han 1 time per month per tool; 1-4 times/month
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination[†]			High		1.0	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.0038 - <0.20 ppm TWA: <0.0036 - <0.20
Number of Samples:	28
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Fab Worker: Production operators of tools using NMP and maintenance technicians
Type of Sampling:	Personal and area
Exposure Duration:	Fab operators and technicians typically work in the fab 10.5 hours of a 12-hour shift.
Exposure Frequency:	Daily
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID; OSHA 7

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.					
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	5161295					

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured Exposure Range: <0.013 - <0.14 ppm TWA: N/A
Number of Samples:	9
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Fab Area Monitoring (near tools that use NMP in process)
Type of Sampling:	Personal and area
Exposure Duration:	Fab operators and technicians typically work in the fab 10.5 hours of a 12-hour shift.
Exposure Frequency:	Daily
PPE:	Semiconductor fab workers wear long sleeved coveralls with hoods and boots as well as gloves and safety glasses that provide ?98 percent skin coverage. Personal protective equipment such as chemical resistant aprons and gloves, face shields, and respiratory protection are used when necessary to further reduce worker exposure.
Analytic Method:	NIOSH 1302; mod. NIOSH 1302 - GC/FID; PV2043; OSHA PV2043 - SOP-5, GC-FID; OSHA 7

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5161295				

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination[†]			High		1.0	

⋆ MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured: <0.4 ppm TWA: <0.35 ppm
Number of Samples:	1
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Waste truck loading: Transfer of approximately 5,000 gallons of NMP waste from a 10,000 gallon tank to a tanker truck.
Type of Sampling:	Personal
Exposure Duration:	2 to 4 hours
PPE:	Tasks are performed by one employee and the truck driver. The employee wears safety glasses and face shield, PVC apron with sleeves, long pants and work boots, and Trionic gloves.
Analytic Method:	mod. NIOSH 1302 - GC/FID BADGE

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5161295				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 6: Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Measured: 1.2 ppmTWA: 1.18 ppm
Number of Samples:	1
Number of Sites:	14 total sites sampled in study
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Virgin NMP truck off-loading: Pull 6 samples for purity analysis; transfer of virgin NMP from a 10,000 gallon tanker truck to a 10,000 gallon tank in the tank farm. Turn on pump; stay in enclosure upstairs during 2 hour transfer.
Type of Sampling:	Personal
Exposure Duration:	2 to 4 hours
PPE:	Tasks are performed by one employee and the truck driver. The employee wears safety glasses and face shield, PVC apron with sleeves, long pants and work boots, and Trionic gloves.
Analytic Method:	mod. NIOSH 1302 - GC/FID BADGE

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5161295

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Kemira. 2018. RE: N-Methylpyrrolidone (NMP) (CASRN 872-50-4). EPA-HQ-OPPT-2016-0743-0085.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176404

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
PPE:	chemical resistant jacket, gloves, goggles and a face shield

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	FUJIFILM Electronics Materials USA Inc.. 2017. NMP Use/Application Survey FFEM/FEUP. EPA-HQ-OPPT-2016-0743-0024.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176406

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - semiconductor manufacturing
Engineering Control & percent Exposure Reduction:	Enclosed process; In many cases, operations are conducted in class 100 or class 10 clean rooms.
PPE:	Safety Glasses, impervious gloves, protective clothing with respirators if required

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Saft American Inc.. 2017. Memorandum to EPA: N-methylpyrrolidone, docket ID number EPA-HQ-OPPT-2016-0743. EPA-HQ-OPPT-2016-0743-0005.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176407

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - batteries
Worker Activity:	Workers may also be potentially exposed during dilution, mixing, or sampling of solutions containing NMP,
Engineering Control & percent Exposure Reduction:	totally or partially enclosed and equipped with ventilation
PPE:	face shields, gloves, and chemical resistant clothing

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination[†]			High		1.1	

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176408

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range: less than the detection limit to 0.202 mg/m3
Number of Samples:	unknown
Number of Sites:	unknown
Type of Measurement or Method:	full-shift TWA
Worker Activity:	Wafer stripping ("cleaning") removing photoresist. Wafer cleaning for organics removal. Operations are in a closed processing system.
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Methodology is stated and seems legitimate
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	EU
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2003 - 2011
	Metric 5:	Sample Size	Medium	× 1	2	range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	lacks exposure duration and frequency
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

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Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5176408				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		Medium		1.8	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176408

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range: 0.0247 to 0.857 mg/m3
Number of Samples:	unknown
Number of Sites:	unknown
Type of Measurement or Method:	full-shift TWA
Worker Activity:	Photolithography layer spin-on. Polyimide deposition. Operations are in a closed processing system.
Type of Sampling:	personal

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Methodology is stated and seems legitimate
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	EU
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2003 - 2011
	Metric 5:	Sample Size	Medium	× 1	2	range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	lacks exposure duration and frequency
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

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Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176408

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	5176408	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range: less than the detection limit to 0.770 mg/m3
Number of Samples:	unknown
Number of Sites:	unknown
Type of Measurement or Method:	full-shift TWA
Worker Activity:	Preventive maintenance at process equipment tools in the cleanroom. Invasive maintenance.
Type of Sampling:	personal

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Methodology is stated and seems legitimate
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	EU
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2003 - 2011
	Metric 5:	Sample Size	Medium	× 1	2	range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	lacks exposure duration and frequency
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176408

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176408

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Range: less than the detection limit to 4.054 mg/m3
Number of Samples:	unknown
Number of Sites:	unknown
Type of Measurement or Method:	full-shift TWA
Worker Activity:	Chemicals storage and delivery areas open to ambient air. Canister, bottle and container change at tools and chemfill stations not in the cleanroom.
Type of Sampling:	personal

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Methodology is stated and seems legitimate
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	EU
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2003 - 2011
	Metric 5:	Sample Size	Medium	× 1	2	range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	lacks exposure duration and frequency
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5176408				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		Medium		1.8	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Celanese Engineered Materials. 2017. N-methylpyrrolidone (NMP) CASRN: 872-50-4, use, disposal and exposure scenarios. EPA-HQ-OPPT-2016-0743-0015.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176410

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Worker Activity:	Exposure scenarios include: 1. Exposure to vapors when the NMP bottoms waste stream is dumped into a hopper to cool or when the hoppers are being dumped into roll off boxes.; 2. Line breaking activities for maintenance personnel. PPE is defined.; 3. Other fugitive emission exposure during sampling, lab analysis or in the event of a leak.
Engineering Control & percent Exposure Reduction:	NMP is used in a contained system in which all vapors are collected in vent systems and burned in a thermal oxidizer. Destruction efficiency of the thermal oxidizer is >99.9 percent .

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.

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Source Citation:	Celanese Engineered Materials. 2017. N-methylpyrrolidone (NMP) CASRN: 872-50-4, use, disposal and exposure scenarios. EPA-HQ-OPPT-2016-0743-0015.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176410

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Akin Gump Strauss Hauer & Feld LLP. 2018. Re: EPA docket EPA-HQ-OPPT-2016-0743: N-Methyl-2-pyrrolidone ("NMP"), CAS# 872-50-4 comments regarding the NMP problem formulation document. EPA-HQ-OPPT-2016-0743-0102.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176411

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	dip cleaning of plastic films
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Occupational exposure levels to NMP through inhalation range from negligible to approximately 4 ppm
Type of Measurement or Method:	8-hour TWA
Engineering Control & percent Exposure Reduction:	scrubbers or a Regenerative Thermal Oxidizer (RTO)
PPE:	Neoprene gloves, long sleeve cotton uniforms with pants and/or coveralls, safety shoes, and safety glasses. Face shields and safety goggles along with chemical resistant aprons are utilized for tasks with liquid splash potential

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2018
Metric 5:	Sample Size	Low	× 1	3	qualitative or characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	Monitoring data do not include any needed metadata to understand what the data represent - i.e., PBZ or Area, Num. of samples, worker activities

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Source Citation:	Akin Gump Strauss Hauer & Feld LLP. 2018. Re: EPA docket EPA-HQ-OPPT-2016-0743: N-Methyl-2-pyrrolidone ("NMP"), CAS# 872-50-4 comments regarding the NMP problem formulation document. EPA-HQ-OPPT-2016-0743-0102.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176411

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	$\times$ 1	3	does not address variability or uncertainty
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.0.

[**] Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	American Chemistry Council. 2017. American Chemistry Council comments on the U.S. Environmental Protection Agency's initial 10 chemicals identified for risk evaluation. EPA-HQ-OPPT-2016-0743-0011.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176412

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints, coatings, adhesives
Engineering Control & percent Exposure Reduction:	The products are batch manufactured in an enclosed process. The process vents to a carbon absorber. During the compounding process, the blend vessel is closed.
PPE:	Full face respirators

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	ACC poll of trade association members. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination[†]			High		1.1	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND - 7.745 ppm
Number of Samples:	174
Number of Sites:	16
Type of Measurement or Method:	short-term measurements and full-shift
Worker Activity:	All Other Converted Paper Product Mfg.; All Other Misc. Wood Product Mfg.; All Other Plastics Product Mfg.; All Other Rubber Product Mfg.; Fabric Coating Mills; Iron Foundries; Landscaping Services; Metal Coating, Engraving (Except Jewelry and Silverware), and Allied Services to Manufacturers; Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (Except Precious) Mfg.; Photographic and Photocopying Equipment Mfg.
Type of Sampling:	personal and area

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3:	Applicability	Medium	× 2	4	These conditions of use are unknown but likely fall within the scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	Samples collected in 1984 to 1999. Data are more than 20 years old.

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Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†			Medium		2.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND - 1.54 ppm
Number of Samples:	53
Number of Sites:	10
Type of Measurement or Method:	short-term measurements and full-shift
Worker Activity:	Administration of Education Programs; Institutional Furniture Manufacturing; Nonferrous Metal (Except Copper and Aluminum) Rolling, Drawing, and Extruding; Other Industrial Machinery Mfg.; Printing Machinery and Equipment Mfg.
Type of Sampling:	personal and area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3: Applicability	Medium	× 2	4	These conditions of use are unknown but likely fall within the scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	Samples collected in 2000 to 2001. Data are more than 10 years old but not more than 20 years old.
	Metric 5: Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity					

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
	Metric 6:	Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†			Medium		1.8	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND - 2.52 ppm
Number of Samples:	19
Number of Sites:	6
Type of Measurement or Method:	short-term measurements and full-shift
Worker Activity:	All Other Miscellaneous Fabricated Metal Product Manufacturing; Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers; Regulation, Licensing, and Inspection of Miscellaneous Commercial Sectors; Reupholstery and Furniture Repair; Sign Manufacturing
Type of Sampling:	personal and area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
Metric 3:	Applicability	Medium	× 2	4	These conditions of use are unknown but likely fall within the scope
Metric 4:	Temporal Representativeness	High	× 2	2	Samples collected in 2011 to 2019. Data are less than 10 years old.
Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Printing
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND (5 samples); 0.2637 ppm
Number of Samples:	6
Number of Sites:	2
Type of Measurement or Method:	short-term
Worker Activity:	Commercial Printing (Except Screen and Books)
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3: Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	Samples collected in 2000 to 2001. Data are more than 10 years old but not more than 20 years old.
	Metric 5: Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	3827305	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.37 - 13.84 ppm
Number of Samples:	4
Number of Sites:	1
Type of Measurement or Method:	Full-shift
Worker Activity:	Capacitor, Resistor, Coil, Transformer, and Other Inductor Mfg.
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Samples collected in 2007. Data are not more than 10 years old (measured from start of project, 2016).
	Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.

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Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND
Number of Samples:	1
Number of Sites:	1
Type of Measurement or Method:	short-term measurements
Worker Activity:	Bare Printed Circuit Board Mfg
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	Samples collected in 2000. Data are more than 10 years old but not more than 20 years old.
	Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND
Number of Samples:	3
Number of Sites:	1
Type of Measurement or Method:	short-term measurements and full-shift
Worker Activity:	Semiconductor and Related Device Mfg.
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3: Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	Samples collected in 1998. Data are more than 10 years old but not more than 20 years old (measured from start of project, 2016).
	Metric 5: Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3827305

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Cleaning
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	0.153, 0.203, 0.59 ppm
Number of Samples:	3
Number of Sites:	1
Type of Measurement or Method:	short-term measurements
Worker Activity:	Janitorial Services
Type of Sampling:	personal

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	Samples collected in 1992. Data are more than 20 years old.
	Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty						

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Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.	
Type of Data Source	Occupational Exposure; Monitoring Data;	
Hero ID	3827305	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Pesticides
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND
Number of Samples:	2
Number of Sites:	1
Type of Measurement or Method:	short-term measurements
Worker Activity:	Exterminating and Pest Control Services
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA and state inspectors are expected to use OSHA or NIOSH sampling methods. Samples sent to the OSHA SLTC are expected to be analyzed using OSHA or NIOSH analytical methods.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3: Applicability	Unacceptable	× 2	8	This is a non-TSCA use
	Metric 4: Temporal Representativeness	Low	× 2	6	Samples collected in 1988. Data are more than 20 years old.
	Metric 5: Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	OSHA data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty					

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Source Citation:	OSHA. 2017. Chemical Exposure Health Data (CEHD) provided by OSHA to EPA.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3827305				

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	Low	× 1	3	OSHA data do not address variability or uncertainty
Overall Quality Determination†			Unacceptable		4	Metric Mean Score: 2.4.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	FUJIFILM Holdings America Corporation. 2020. FUJIFILM comments for docket ID # EPA-HQ-OPPT-2019-0236 for CASRN 872-50-4, n-methylpyrrolidone (NMP).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592030

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation into solutions for electronics industry
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND (14 samples), 0.23 ppm, 0.86 ppm
Number of Samples:	16
Number of Sites:	1
Type of Measurement or Method:	full-shift measurements
Worker Activity:	Lab technician (analytical work) and tote filling
Type of Sampling:	personal
Engineering Control & percent Exposure Reduction:	Enclosed processes. Hood. LEV.
PPE:	PPE required - the gloves in use are Showa brand #3416: neoprene-coated, 15-mil thickness, and 14-inch gauntlet cuff with interlock knit lining. Safety glasses. Chemical hygiene training on a scheduled basis and use of PPE are a requisite condition of employment and prior to first use of NMP and all other chemicals in the facility.

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Samples collected in 2019. Data are less than 10 years old.
	Metric 5:	Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.

Source Citation:	FUJIFILM Holdings America Corporation. 2020. FUJIFILM comments for docket ID # EPA-HQ-OPPT-2019-0236 for CASRN 872-50-4, n-methylpyrrolidone (NMP).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592030

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	These data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	These data do not address variability or uncertainty
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592033

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Physical Form:	vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	ND - 9.8 ppm
Number of Samples:	22
Number of Sites:	2
Type of Measurement or Method:	full-shift measurements (8-hour TWA)
Worker Activity:	cathode coating; cathode mixing; cleaning; fill room; maintenance; mix room; research and development
Type of Sampling:	personal
Exposure Duration:	Total exposure would be on the order of minutes rather than hours
Engineering Control & percent Exposure Reduction:	Lithium ion cells are produced in a tightly controlled manufacturing environment and closed pipe systems are used for NMP transfer. Dry room design to prevent absorption of water. All NMP tanks with the exception of the slurry tanks, are equipped with a nitrogen blanketing system as a measure to protect the quality of the NMP.
PPE:	Full coverage PPE. NMP-resistant butyl rubber gloves. Personnel working in mixing and coating areas receive extensive training regarding the processes and proper PPE. Additional PPE is provided for work that will involve contact or potential contact with NMP and includes chemical resistant suits, respirators, and chemical resistant gloves, depending on the task performed. These workers are required to wear full body chemical resistant suit with booties/shoe covers. The equipment includes a PAPR and hood with organic/acid gas + HEPA cartridge coverage. Gloves are required, typically double latex for limited contact with NMP. Butyl gloves are required when contact with NMP is expected. (pg. 15-16)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592033

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Sampling or analytical methodology is not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	Data collected in the United States
	Metric 3: Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4: Temporal Representativeness	High	× 2	2	Samples collected in 2011 to 2019. Data are less than 10 years old.
	Metric 5: Sample Size	High	× 1	1	Individual measurements are provided so the sample sets can be fully statistically characterized.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	These data include sample type and exposure type. Sample times also provided.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	These data do not address variability or uncertainty
Overall Quality Determination[†]		High		1.6	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	EaglePicher Technologies, LLC. 2020. Comments of EaglePicher Technologies, LLC on the draft TSCA risk evaluation of n-methylpyrrolidone (NMP): EPA"HQ"OPPT-2019-0236.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592029

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Worker Activity:	At no time do any EaglePicher employees come into direct dermal contact with NMP. Employees infrequently work with NMP, as our batch manufacturing process only occurs periodically. Activities with NMP include mixing, transfer the blended binder mix and clean a small tank.
Exposure Duration:	total time for all activities combined is less than 2.5 hours
Engineering Control & percent Exposure Reduction:	Blending and application of coating (containing NMP) occurs in a closed system. After coating, the parts are dried in an oven (NMP evaporates) with a capture system that vents all the emissions outside.
PPE:	Protective clothing, gloves specifically designed to protect against NMP exposure, respirators, and goggles/face-shields. employees wear PPE with an assigned protection factor (APF) of 1,000 that precludes in-halation or dermal contact.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information from manufacturer of lithium ion batteries. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					

Source Citation:	EaglePicher Technologies, LLC. 2020. Comments of EaglePicher Technologies, LLC on the draft TSCA risk evaluation of n-methylpyrrolidone (NMP): EPA"HQ"OPPT-2019-0236.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592029				

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†			High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592024

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Exposure Concentration (Unit):	Direct hand/skin contact does not occur.
Worker Activity:	Cathode slurry mixing. Maintenance - equipment cleaning and repair. Small container unloading: 1-gallon containers (only applicable to small sites). NMP unloading at large sites is done by the vendor. Drum handling - for some small scale operations, waste disposal includes pouring small quantities of residual into closed 50-gallon drum
Exposure Duration:	30 mins (mixing); 4 hours (Maintenance); 30 mins (small container unloading); 1 hour (drum handling)
Exposure Frequency:	250 day/yr (mixing); infrequent - few times/year (maintenance); infrequent - couple weeks per year (drum handling)
Engineering Control & percent Exposure Reduction:	Small sites: NMP containers are opened and mixed under an engineering hood. Large sites: enclosed process. Fume hoods, fume extractors, jigs.
PPE:	Mixing: Light Tyvek, Safety glasses, Nitrile gloves, Safety shoes, Surgical mask, Hairnet and bump cap. Donning procedures and rooms with training. //Maintenance: Heavy Tyvek /or aprons, PAPR or respirator /goggles, Heavy butyl gloves over lighter gloves, Safety shoes. Donning procedures and rooms with training. //Small container: Goggles /face shield, Butyl gloves over nitrile, Aprons. Donning procedures and rooms with training.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
		Continued on next page			

Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592024				

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Exposure duration provided as single value. Uncertain statistics and uncertain if representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†			High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592024

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Exposure Concentration (Unit):	No potential for dermal contact due to PPE usage.
Worker Activity:	Small sealed containers. Drums.
Exposure Frequency:	intermittent
PPE:	For slurry materials: Tyvek Suit, Protective Gloves, Shoe Covers, Safety glasses, Hair net, beard net and face mask. When powders involved: PAPR (Powered Air Purifying Respirator) with a HEPA filter instead of hair net, beard net and face mask. Are trained on proper glove use.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination[†]		High		1.4	

Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592024

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Supplemental NMP information to document PPE protection for submission to docket from Lithium Ion Cell Manufacturers. EPA-HQ-OPPT-2016-0743-0116.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592044

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Exposure Concentration (Unit):	There is no actual exposure to NMP during any of these tasks due to engineering controls and PPE.
Worker Activity:	Container Handling, Small Containers - including manual transfers and mixing preparation //Container Handling, Drums - loading waste material into drums //Batch mixing; Batch coating and drying // Maintenance activities //occupational non-user exposures - NMP used in secured area. Process and safety checks and walk-throughs occur.
Exposure Duration:	30 - 60 mins/day (small containers) //30 - 60 mins/month (drums) //2-6 hours/day (small operations); 12-hr shifts (large operations) (mixing) //60 mins/month (maintenance; ONUs)
Exposure Frequency:	daily (small containers, mixing); monthly (drums, maintenance, ONUs)
Engineering Control & percent Exposure Reduction:	Small operations: Closed systems, some process piping, ventilation controls. //Large operations: Fully automated systems - closed reactors, process piping, ventilation controls, manufacturing one or few types of cells. Semi-automated systems - same as above but greater operational flexibility needed, manufacturing different cell types. //Additional controls provided for each activity.
PPE:	Small operations: Latex (no expected exposure; PPE to prevent product contamination). Safety glasses, lab coat, and surgical mask. //Large operations: Fully automated systems - nitrile (no expected exposure; PPE to prevent product contamination). Light Tyvek, safety glasses, safety shoes, surgical mask, hairnet, and bump cap. Semi-automated systems - butyl over latex or nitrile (no expected exposure; PPE to prevent product contamination). PAPR with hood and organic vapor/ acid gas/HEPA combination cartridge. //Additional PPE provided for each activity.

EVALUATION

Continued on next page

Source Citation:	LICM. 2020. Supplemental NMP information to document PPE protection for submission to docket from Lithium Ion Cell Manufacturers. EPA-HQ-OPPT-2016-0743-0116.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592044

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	Medium	× 1	2	Exposure duration provided as single value or range. Uncertain statistics and uncertain if representative.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3986801

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Same monitoring data as 5161295
Number of Samples:	118.0
Number of Sites:	14.0
Type of Measurement or Method:	Full shift TWA (8 or 12 hours)
Worker Activity:	Same activities as 5161295 (described further on page 6).
Type of Sampling:	Personal
Exposure Duration:	Same as 5161295; Fab operators and technicians typically work in the fab 10.5 hours of a 12-hour shift.
Exposure Frequency:	Same as 5161295; Waste truck loading (follow-up on 5161295): 1/yr
Engineering Control & percent Exposure Reduction:	The fabrication of semiconductors is conducted in specialized buildings known as "fabs" that involve the use of cleanrooms, and a hierarchy of design features that isolate workers and the product wafers from chemicals and contaminants. Exhaust ventilation. Modern high-volume manufacturing fabs use enclosed, interlocked, ventilated, and automated manufacturing equipment (tools) which separate employees from the product wafer and process chemicals.
PPE:	Fab workers wear cleanroom garments (cleanroom suit with hood and boots), gloves, and safety glasses (see Figure 2) which provide ?98 percent skin coverage. Activity-specific PPE same as 5161295. Workers have appropriate training, including on donning and doffing gloves.

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3986801

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
	Metric 5:	Sample Size	High	× 1	1	Discrete data points provided
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†			High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Intel Corporation. 2019. Intel comments to: Science Advisory Committee on Chemicals (SACC) on the draft Toxic Substances Control Act (TSCA) risk evaluation for N-Methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0037.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592026

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Worker Activity:	container change out, maintenance, routine operations
PPE:	Chemical resistant PPE is always required for any tasks where there is potential for skin contact. PPE includes Chemical Resistant Gloves, Chemical Resistant Gown, Chemical Goggles, Face Shield. Source describes PPE training received by employees, including when PPE is required, what PPE is required, and proper donning and doffing.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2019
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty

Source Citation:	Intel Corporation. 2019. Intel comments to: Science Advisory Committee on Chemicals (SACC) on the draft Toxic Substances Control Act (TSCA) risk evaluation for N-Methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0037.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592026

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.4	

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[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Intel Corporation. 2020. Comments of Intel to the United States Environmental Protection Agency on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone. EPA-HQ-OPPT-2019-0236-0064.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592034

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	Vapor
Route of Exposure:	Inhalation
Exposure Concentration (Unit):	Same monitoring data as 5161295
Engineering Control & percent Exposure Reduction:	Engineering controls include the use of bulk chemical delivery to reduce manual handling of chemical containers, lockout/tagout to turn off bulk chemical supplies prior to equipment maintenance, flushing of filters and housing prior to work, integrated local ventilation exhaust on manufacturing equipment, liquid leak detection systems, use of ventilated parts clean sinks or hoods for parts cleaning, and emergency machine off systems.
PPE:	The current PPE required is: MAPA8 Trionic 514+ (or equivalent) chemical resistant gloves3, chemical resistant gowns, and eye and face protection. Employees receive training on proper PPE usage.
Analytic Method:	NIOSH 1302; OSHA PV2043

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Sampling or analytical methodology is an approved OSHA or NIOSH method
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from 2018
Metric 5:	Sample Size	High	× 1	1	Discrete data points provided

Source Citation:	Intel Corporation. 2020. Comments of Intel to the United States Environmental Protection Agency on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone. EPA-HQ-OPPT-2019-0236-0064.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592034

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Raw data provided and is well-described by metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.511 mg/m3 (central tendency); 0.613 mg/m3 (High-end) Dermal surface area: 24.08 cm2 (male) and 20.03 cm2 (female) (central tendency); 80.25 cm2 (male) and 66.75 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	container handling, small containers
Exposure Duration:	Dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end) Task durations as low as 5 to 10 minutes
Exposure Frequency:	3 days/week over 50 weeks/yr (central tendency); 4 days/week over 50 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020

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Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.				
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;				
Hero ID	6592032				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 5: Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.013 mg/m3 (central tendency); 1.557 mg/m3 (High-end)Dermal surface area: 24.08 cm2 (male) and 20.03 cm2 (female) (central tendency); 80.25 cm2 (male) and 66.75 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	container handling, drums
Exposure Duration:	dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end)
Exposure Frequency:	3 days/week over 50 weeks/yr (central tendency); 4 days/week over 50 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.

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Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination[†]		High		1.2	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.139 mg/m3 (central tendency); 0.409 mg/m3 (High-end)Dermal surface area: 0 cm2 (male and femal, central tendency and high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	typical fab worker
Exposure Duration:	0 hrs of dermal exposure
Exposure Frequency:	3 days/week over 50 weeks/yr (central tendency); 4 days/week over 50 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.
Domain 3: Accessibility/Clarity						

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Source Citation:		Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.			
Type of Data Source		Occupational Exposure; Completed Exposure or Risk Assessments;			
Hero ID		6592032			

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination†			High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.139 mg/m3 (central tendency); 0.409 mg/m3 (High-end)Dermal surface area: 24.08 cm2 (male) and 20.03 cm2 (female) (central tendency); 80.25 cm2 (male) and 66.75 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	fab worker with NMP container changeout
Exposure Duration:	dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end)
Exposure Frequency:	3 days/week over 50 weeks/yr (central tendency); 4 days/week over 50 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.

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Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination[†]		High		1.2	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.020 mg/m3 (central tendency); 0.696 mg/m3 (High-end)Dermal surface area: 267.50 cm2 (male) and 222.50 cm2 (female) (central tendency); 374.50 cm2 (male) and 311.50 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	maintenance
Exposure Duration:	dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end)
Exposure Frequency:	3 days/week over 50 weeks/yr (central tendency); 4 days/week over 50 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.

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Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination[†]		High		1.2	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 4.822 mg/m3 (central tendency); 4.822 mg/m3 (High-end)Dermal surface area: 80.25 cm2 (male) and 66.75 cm2 (female) (central tendency); 267.50 cm2 (male) and 22.50 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	virgin NMP truck unloading
Exposure Duration:	dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end)
Exposure Frequency:	1 day/week over 1 week/yr (central tendency and high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination[†]		High		1.2	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics semiconductors
Physical Form:	vapor, liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	Air concentration: 0.715 mg/m3 (central tendency); 0.715 mg/m3 (High-end)Dermal surface area: 80.25 cm2 (male) and 66.75 cm2 (female) (central tendency); 267.50 cm2 (male) and 22.50 cm2 (female) (high-end)Daily dermal loading: 0.7 mg/cm2 (central tendency) and 2.1 mg/cm2 (high-end)
Type of Measurement or Method:	PBPK model inputs
Worker Activity:	waste truck loading
Exposure Duration:	dermal exposure duration: 0.33 hrs (central tendency); 1 hour (high-end)
Exposure Frequency:	1 day/week over 12 weeks/yr (central tendency); 1 day/week over 17.3 weeks/yr (high-end)
PPE:	Gloves with Protection Factor of 20. Additional information on type of PPE used and employee training.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Assessment uses data from member companies of trade association. Information does not indicate flaws or quality issues.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	Medium	× 1	2	Inputs characterized as central tendency and high-end. Unclear if these inputs are representative of all semiconductor manufacturing sites.

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Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	6592032

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The assessment addresses variability and uncertainty in the results. Uncertainty is well characterized.
Overall Quality Determination[†]		High		1.2	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Hach Company. 2020. Hach's comments regarding the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP), EPA docket EPA-HQ-OPPT-2019-0236.	
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	6592027	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation
Worker Activity:	In small-scale incorporation of NMP into a mixture, NMP is transferred from hand-held containers, such as a 1-gallon container, to the mixing vessel. Fewer than 10 gallons per day of NMP are handled.
PPE:	Workers are required to wear the following personal protective equipment: gloves (laminate film, latex at least 20 mil thickness, or butyl at least 20 mil thickness); safety glasses for operations in fume hood, or splash goggles; fume hood or half-face or full-face respirator.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†			High		1.4	

Source Citation:	Hach Company. 2020. Hach's comments regarding the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP), EPA docket EPA-HQ-OPPT-2019-0236.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592027

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	National Electrical Manufacturers Association. 2020. NMP use in magnet wire. EPA-HQ-OPPT-2019-0236-0047.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - magnet wires
Worker Activity:	Magnet wire coating. Equipment cleaning.
Engineering Control & percent Exposure Reduction:	The polymer applicator and curing oven are completely enclosed and there is no human exposure to NMP during this process. This process is also completely enclosed while equipment is cleaned.
PPE:	Human exposure to NMP is controlled through the use of personal protection equipment such as gloves, aprons and goggles.

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination[†]		High		1.4	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	ACA. 2020. American Coatings Association submittal to NMP docket: EPA-HQ-2016-0743.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6592043

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation of paint
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	<0.091 ppm
Number of Samples:	1.0
Number of Sites:	1.0
Type of Measurement or Method:	TWA
Worker Activity:	Paint formulation - Employee working in WB small batch loading to 504. Worked at solvent bath SR1 for < 10 min washing a wand.
Number of Workers:	1.0
Type of Sampling:	personal
Exposure Duration:	sample time: 375 mins (6.25 hours)
Engineering Control & percent Exposure Reduction:	Local Exhaust and General Exhaust
PPE:	Nitrile and Hyflex Gloves, Safety Glasses, Goggles, Nomex protective clothing
Analytic Method:	Sample method: SO-3, GC-FID NIOSH 1550

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Sampling methodology is an approved NIOSH method
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2018
	Metric 5:	Sample Size	Low	× 1	3	One sample result provided. Distribution of samples is unknown.

Source Citation:	ACA. 2020. American Coatings Association submittal to NMP docket: EPA-HQ-2016-0743.				
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	6592043				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Monitoring data include same type, exposure type, and duration. Data do not include exposure duration, exposure frequency, or detailed worker activities.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Supplemental NMP information to document PPE protection for submission to docket from Lithium Ion Cell Manufacturers. EPA-HQ-OPPT-2016-0743-0116.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592044

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - lithium ion battery
Worker Activity:	For small operations, NMP is received in one-gallon containers that are securely stored until they are carefully transferred to the mixing room. In some circumstances, small operators perform a controlled transfer from a small bottle of waste containing NMP into a 55-gallon drum, using an industrial-grade funnel with a sealable lid and spill containment. In other circumstances, small operators place sealed small bottles into a 55-gallon drum. The drums are then torqued to seal them and taken on a drum dolly to a secure storage location until a third-party vendor loads the drums onto a truck for disposal.
Engineering Control & percent Exposure Reduction:	Extensive engineering controls exist within large operations to prevent worker contact with NMP and NMP-containing slurry.
PPE:	The selection of protective glove materials is based on the recommendations of leading glove manufacturers. Workers are trained in PPE usage. Instruction in PPE is augmented by signage in the workplace, dedicated stations to don PPE, and the use of mixing air showers before entry into secured production areas. Information on NMP breakthrough times for various gloves and PPE training materials are provided.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	This occupational condition of use is in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020

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Source Citation:	LICM. 2020. Supplemental NMP information to document PPE protection for submission to docket from Lithium Ion Cell Manufacturers. EPA-HQ-OPPT-2016-0743-0116.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592044				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Facility

Source Citation:	Cory, N. J.. 2002. An update on environmental constraints. American Leather Chemists Association. Journal.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	2874538

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Polymer solvent; leather finishing
Process Description:	NMP is used as a solvent for urethane polymerization. It is found in residual concentrations in polyurethane coatings used for leather finishing. NMP has been found in auto leather at concentrations up to averaging 3,000 mg/kg. Studies on boot leather have demonstrated significantly-lower NMP concentrations ranging from 200 to 600 mg/kg.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2002
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	Assessment or report does not document its data sources, assessment methods, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.2.

Source Citation:	Cory, N. J.. 2002. An update on environmental constraints. American Leather Chemists Association. Journal.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	2874538

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Solomon, G. M.,Morse, E. P.,Garbo, M. J.,Milton, D. K.. 1996. Stillbirth after occupational exposure to N-methyl-2-pyrrolidone: A case report and review of the literature. Journal of Occupational and Environmental Medicine.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3043623

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Laboratory
Process Description:	NMP used to dissolve solid samples (negative photoresist), which is analyzed in atomic absorption spectrophotometers, and discarded as Haz waste. NMP first poured from 5 gallon containers through an ion exchange column for filtering before use. Custom chemical manufacturer.
Batch Size:	1 L/day

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From an industry contact
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Use is in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1996 - more than 20 years old
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty of results
Overall Quality Determination[†]			Medium		1.8	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3539720

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Adhesive formulation facility
Process Description:	NMP was applied for the manual cleaning of mixing and stirring vessels (500 l volume) and of smaller parts such as drain valves and tools. After the mixing of the basic compounds (2 h), the vessels are emptied and the stirrers and upper parts of the mixers are cleaned manually with brushes and wiping cloths. The vessels are then disassembled and cleaned for about 30 min with brushes and cloths together with inlets, drain valves and other fittings.
Possible Physical Form:	liquid
Chemical Concentration:	65 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From an industry contact
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Germany
Metric 3:	Applicability	High	× 2	2	Use is in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty.

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Source Citation:	Bader, M.,Rosenberger, W.,Rebe, T.,Keener, S. A.,Brock, T. H.,Hemmerling, H. J.,Wrbitzky, R.. 2006. Ambient monitoring and biomonitoring of workers exposed to N-methyl-2-pyrrolidone in an industrial facility. International Archives of Occupational and Environmental Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3539720

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3562767

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Degreasing optical lenses
Process Description:	The lenses were washed in a room with a large washing chamber (1 m x I m x 2.5 m). Four workers were engaged in the washing process. Fifty lenses were put in a special container basket. Workers opened a door of the chamber to dip the basket into a pool containing NMP inside the chamber. After closing the door, sonication was started to wash the lens surfaces. This washing process lasted for 5 min. After washing, the baskets were lifted from the pool and then dried outside the chamber for a couple of minutes.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From an industry contact
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Japan
	Metric 3:	Applicability	High	× 2	2	Degreasing is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty.

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Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3562767

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		Medium		1.8	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3562767

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Degreasing metal parts
Process Description:	They put more than 100 parts in a basket, opened the cover of a tank containing NMP and dumped the basket into the tank. The lid of the container was then closed. After 30 min of soaking in NMP, the basket was lifted out and immediately transferred to a tank containing water. Some drops adhering to the parts and baskets were scattered over the floor. Other drops were carried into the water tank. NMP evaporated into the washing room air from the contaminated floor and water tank. Eight workers were engaged in this process.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From an industry contact
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Japan
	Metric 3:	Applicability	High	× 2	2	Degreasing is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty.

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Source Citation:	Xiaofei, E.,Wada, Y.,Nozaki, J.,Miyauchi, H.,Tanaka, S.,Seki, Y.,Koizumi, A.. 2000. A linear pharmacokinetic model predicts usefulness of N-methyl-2-pyrrolidone (NMP) in plasma or urine as a biomarker for biological monitoring for NMP exposure. Journal of Occupational Health.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3562767

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Overall Quality Determination†		Medium		1.8	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Muenter, J., Blach, R.. 2010. ECOLOGICAL TECHNOLOGY: NMP-FREE LEATHER FINISHING. American Leather Chemists Association. Journal.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3577026

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coating - polymeric for leather finishing
Process Description:	NMP eased the production of binders and the application on lemher. NMP influences the viscosity and even the rheology. When NMP is used in leather finishing almost 90 percent remains in the leather after drying, but is gradually released over a long period of time.
Chemical Concentration:	0-7.1 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	The assessment or report uses high quality data and/or techniques that are not from trusted sources; however, Associated information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Germany
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Assessment or report clearly documents results, methods, and assumptions. Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	The report addresses variability and uncertainty in the results. Uncertainty is well characterized

Source Citation:	Muenter, J.,Blach, R.. 2010. ECOLOGICAL TECHNOLOGY: NMP-FREE LEATHER FINISHING. American Leather Chemists Association. Journal.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3577026

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Lammens, T. M., Potting, J., Sanders, J. P. M., De Boer, I. J. M.. 2012. Environmental comparison of biobased chemicals from glutamic acid with their petrochemical equivalents. International Sugar Journal.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3578330

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Total Annual U.S. Volume (and percent of PV):	100-150 kton

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from journal articles
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Manufacturing is in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2010
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty for this data element
Overall Quality Determination[†]		High		1.4	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Eu,. 2007. Impact assessment of potential restrictions on the marketing and use of dichloromethane in paint strippers. Revised final report-Annexes.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3808951				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	Paint strippers are used to remove various coats of paints especially blistered or cracked coats on wood both indoors and outdoors. NMP cannot be used for polyester or baked on coatings.
Chemical Concentration:	2.5-63 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	OECD member states
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2007
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	The report addresses variability and uncertainty in the results. Uncertainty is well characterized
Overall Quality Determination[†]			High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	ECHA. 2011. Annex XV dossier. Proposal for Identification of a Substance as a CMR Cat 1A or 1B, PBT, vPvB or a Substance of an Equivalent Level of Concern.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3809417

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (petrochemical extraction)
Process Description:	NMP is used in the large-scale recovery of hydrocarbons by extractive distillation. Hydrocarbons are highly soluble in NMP and differences in volatility are sometimes considerably increased in the presence of NMP (BASF, 2010). NMP is used particularly because, unlike other commercial solvents and extraction media, its use does not lead to the formation of azeotropes10 and because NMP has high resistance to heat and chemicals.
Total Annual U.S. Volume (and percent of PV):	Based on data from OECD (2007), historical use in this application was estimated as 10 percent of global use. If the same is true for current use in the EU, the total use in this application could be around 1,000 -5,000 t/y.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECHA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2011
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty					

Source Citation:	ECHA. 2011. Annex XV dossier. Proposal for Identification of a Substance as a CMR Cat 1A or 1B, PBT, vPvB or a Substance of an Equivalent Level of Concern.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3809417				

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		High		1.1	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	ECHA. 2011. Annex XV dossier. Proposal for Identification of a Substance as a CMR Cat 1A or 1B, PBT, vPvB or a Substance of an Equivalent Level of Concern.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3809417

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (pharmaceutical extraction medium)
Process Description:	According to the OECD (2009) SIDS dossier, NMP is used as a penetration enhancer for a more rapid transfer of substances through the skin. Use as a solvent and extraction medium is reported by industry (Taminco, 2010). There is limited information that suggests NMP could be used as a solvent during the preparation of pharmaceuticals as well as being present in some pharmaceutical products (Jouyban et al, 2010). These authors state that NMP is one of the main pharmaceutical co-solvents and that it is an important solvent used in the extraction, purification and crystallisation of drugs. It is not known whether NMP is used in this way within the EU.
Total Annual U.S. Volume (and percent of PV):	No comprehensive information is available on quantities of NMP currently used in the EU in pharmaceuticals. However, based on the global-level percentage split of uses from several years ago (15 percent) and the assumed quantity used in the EU (10,000 -50,000 t/y), it can be estimated that perhaps 1,500 to 7,500 tonnes of NMP are used in this application each year.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECHA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2011

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Source Citation:	ECHA. 2011. Annex XV dossier. Proposal for Identification of a Substance as a CMR Cat 1A or 1B, PBT, vPvB or a Substance of an Equivalent Level of Concern.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3809417				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	$\times$ 1	1	Data sources included
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	A. L. Harreus, R. Backes, J. O. Eichloer, R. Feuerhake, C. Jakel, U. Mahn, R. Pinkos, R. Vogelsang. 2011. 2-Pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3809424

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture
Process Description:	Large-scale production of NMP is predominantly carried out by reacting ?-butyrolactone with an excess of pure or aqueous methylamine in a high-pressure tube reactor (612 MPa). The reaction is exothermic and often run under adiabatic conditions with reactor temperatures in the range of 250400 ”C. The resulting product mixture is decompressed and distilled. The NMP yield is normally more than 97 percent [27]. Other processes, e.g., analogous to those used for pyrrolidone synthesis can also be used, in particular hydrogenation of N-methylsuccinimide or mixtures of maleic or succinic anhydride and methylamine [28]. NMP can also be produced by hydrogenation of N-hydroxymethyl- 2-pyrrolidone (see Chap. 2) [29] or by reaction of acrylonitrile with methylamine in the presence of a peroxide radical initiator [30].
Possible Physical Form:	liquid
Chemical Concentration:	NMP content, min.99.5 wt percent ; methylamine, max. 0.02 wt percent ; water, max. 0.1 wt percent

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Ullmann's Encyclopedia of Industrial Chemistry
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Germany
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2011
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						

Source Citation:	A. L. Harreus, R. Backes, J. O. Eichloer, R. Feuerhake, C. Jakel, U. Mahn, R. Pinkos, R. Vogelsang. 2011. 2-Pyrrolidone.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3809424				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 6: Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2013. Human health Tier II assessment for 2-pyrrolidinone, 1-methyl, CAS Number 872-50-4.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3809432				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Domestic paint and varnish remover
Chemical Concentration:	up to 100 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	$\times$ 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	$\times$ 1	1	US
	Metric 3:	Applicability	Low	$\times$ 2	6	a non-occupational scenario that is similar to an occupational scenario
	Metric 4:	Temporal Representativeness	High	$\times$ 2	2	2011-2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	$\times$ 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	$\times$ 1	3	Does not address variability or uncertainty for this data element
Overall Quality Determination†			Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2013. Human health Tier II assessment for 2-pyrrolidinone, 1-methyl, CAS Number 872-50-4.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3809432

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Domestic cleaning products
Chemical Concentration:	5 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	a non-occupational scenario that is similar to an occupational scenario
Metric 4:	Temporal Representativeness	High	× 2	2	2011-2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty for this data element
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Facility; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Process Description:	The production of NMP and associated bulk transfers and storage is contained within closed systems. Processes involved are the use in closed systems (PROC1-2-3), the transfer of NMP after production (charging and discharging, see below under generic use), sampling and maintenance and cleaning.
Total Annual U.S. Volume (and percent of PV):	60,000 80,000 tonnes/yr
Number of Sites:	3 US Sites (2007)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination†		High		1.4	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Facility; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation
Process Description:	mixing in batch or continuous processes and further processing steps such as transfers, storage and packing. Such processes might occur in closed systems. In the industrial setting elevated temperatures can be used.

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Petrochemical
Process Description:	NMP is used in the large-scale recovery of hydrocarbons by extractive distillation. Hydrocarbons are highly soluble in NMP. NMP is used in the desulfurization of oil products, the removal of CO_2, COS and H_2S from gas streams and in butadiene production.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coatings, Paints, adhesive, varnish, etc.
Process Description:	NMP is used as a solvent in a wide range of different coating products. NMP is often used in polymer based coatings, such as wire coatings. The characteristics are favorable for baked coatings that are cured at relatively high temperatures (BASF, 2010). The use in coatings may be under elevated temperatures up to 120 ”C. The processes involved in the use of non-wire coatings are in general open processes involving dipping, rolling, spraying and curing/drying of the coatings.
Total Annual U.S. Volume (and percent of PV):	2,220-4,280 tonnes/yr (Europe)
Chemical Concentration:	0.06 13 (paint); 13 68 (paint remover); 0.06 2 (polish); 1-10 (adhesive)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	Europe
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2013
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty

Continued on next page

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Cleaning
Process Description:	NMP is used as an ingredient in paint removers, cleaners and as or in degreasers. It can be used in pure form or in mixtures. Industrially, it can be used under elevated temperatures.
Total Annual U.S. Volume (and percent of PV):	60-95 tonnes/yr
Chemical Concentration:	30-60 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	Europe
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2013
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]			High		1.4	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.	
Type of Data Source	Facility; Completed Exposure or Risk Assessments;	
Hero ID	3809440	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Cleaning and coating in the Electronics industry
Process Description:	Wafer cleaning and stripping to remove organic contamination and organic layers. And, as a solvent in dedicated formulations (i.e., precursor solutions for wafer coatings such as polyimides and anti-reflective coatings).
	<5 tonnes/yr
Total Annual U.S. Volume (and percent of PV):	

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Process Description:	A photoresist carrier solvent. A photoresist stripper.
Total Annual U.S. Volume (and percent of PV):	10-100 tonnes/yr per site

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Europe
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2013
Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.				
Type of Data Source	Facility; Completed Exposure or Risk Assessments;				
Hero ID	3809440				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Battery
Process Description:	In lithium battery production it is applied as a solvent for the binder resins for both the carbon anode and the lithium cobalt oxide cathode, it may be used in gel-polymer lithium ion battery separators/electrolytes, and it may be used in coatings on the outside of the batteries.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Polymers
Process Description:	NMP is used as a processing aid in the production of polymers. Immersion precipitation in a solvent. Up to and including polymerization, this use can be considered as a controlled process, though not fully closed, but after polymerization, the resultant polymer still contains traces of NMP that may evaporate during the production process and may cause worker exposure. The high performance polymer end product is assumed not to contain any remaining NMP.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Agricultural products
Process Description:	NMP is both used in the synthesis of active ingredients and as a co-solvent in the formulation of various agrochemicals. In case NMP is used in the synthesis of active ingredients, the use is fully industrial and NMP is assumed not end up in the final product. If NMP is used as a co-solvent, NMP will obviously be contained in the final products. The concentration of NMP in herbicides, fungicides and pesticides is < 7 percent .
Chemical Concentration:	1-15 (pesticide)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]		High		1.3	

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3809440

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rivm,. 2013. Annex XV Restriction Report: Proposal for a Restriction.			
Type of Data Source	Facility; Completed Exposure or Risk Assessments;			
Hero ID	3809440			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Pharmaceutical
Process Description:	In the production of pharmaceuticals, NMP is an important solvent used in the extraction, purification, and crystallization of pharmaceuticals (Jouyban et al 2010). BASF (2011a) further reports that it produces high grade NMP. A number of topical formulations that may contain NMP as a transdermal enhancer. Also the use as a solvent and as extraction medium

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Information from trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Discussion on variability and uncertainty
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec/Hc,. 2017. Chemicals at a glance: NMP and NEP.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3827463

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Process Description:	NMP is used in industrial applications, as well as in products available to consumers, including paint strippers, cosmetics, and certain food packaging materials. Canadians may be exposed to these substances primarily through products used by consumers, such as paint strippers, nail polish remover and body lotion.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Canada
	Metric 3: Applicability	Unacceptable	× 2	8	Not enough information to assess applicability
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	data sources are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.6.

Source Citation:	Ec/Hc,. 2017. Chemicals at a glance: NMP and NEP.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3827463

EVALUATION

Domain	Metric	Rating	MWF* Score	Comments

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1998. Environmental profile for N-methylpyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3827493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture
Process Description:	See Section 2.1. N-methylpyrrolidone is manufactured by combining y-butyrolactone with methylamine. NMP production is accomplished by condensing y-butyrolactone with methylamine at 200 to 350"C and 10 MPa.
Number of Sites:	3

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	The assessment or report uses data or techniques that are high quality (from trusted sources (e.g., journal articles)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	1998
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	The report provides only limited discussion of the variability and uncertainty in the results.
Overall Quality Determination[†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1998. Environmental profile for N-methylpyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3827493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Chemical Concentration:	12-80 percent

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	The assessment or report uses data or techniques that are high quality (from trusted sources (e.g., journal articles)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	1998
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	The report provides only limited discussion of the variability and uncertainty in the results.
Overall Quality Determination†		High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1998. Environmental profile for N-methylpyrrolidone.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3827493	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	photoresist remover
Process Description:	N-methylpyrrolidone is used in the microelectronics industry to strip phenolic residue from packages and photoresist resins on wafer surfaces and as a vehicle for "die-coat" application.

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	The assessment or report uses data or techniques that are high quality (from trusted sources (e.g., journal articles)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	1998
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	The report provides only limited discussion of the variability and uncertainty in the results.
Overall Quality Determination†		High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).				
Type of Data Source	Facility; Completed Exposure or Risk Assessments;				
Hero ID	3827504				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture or import
Total Annual U.S. Volume (and percent of PV):	184.7 million pounds

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2012-2015
Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	Larger facilities typically purchase in quantities ranging in size from five- to 55-gallon drums. Smaller facilities purchase small quantities of stripper from hardware or paint supply stores. Techniques for paint stripping typically include manual coating, tank dipping and spray application. Pouring, wiping and rolling are also possible application techniques and application can be manual or automated. After application, the stripper is allowed to set and soften the old coating. Once the stripper has finished setting, the old coating is removed from the surface by scraping and brushing. After the old coating is removed, the surface is wiped clean before moving to the next stages of the job.
Total Annual U.S. Volume (and percent of PV):	9 percent
Number of Sites:	In California, approximately 80 facilities that have stripping equipment. 500 additional facilities in the state, which would include small facilities like antique shops
Possible Physical Form:	liquid
Chemical Concentration:	0.25 (low-end), 0.625 (mid), 1 (high-end)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2012-2015
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics

Continued on next page

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3827504

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.2	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. TSCA work plan chemical risk assessment. N-Methylpyrrolidone: Paint stripper use (CASRN: 872-50-4).
Type of Data Source	Facility; Completed Exposure or Risk Assessments;
Hero ID	3827504

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	graffiti removal
Process Description:	Solvents are either spray or brush applied. Sprayed solvents can be swabbed or wiped with a cloth or tissue. After spraying and wiping or brushing the solvent on the surface, the surface is then washed with heated (70oC) wash water using a high-pressure spray.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Data and techniques are high quality; Information from trusted sources.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope with paint stripping
	Metric 4: Temporal Representativeness	High	× 2	2	2012-2015
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3828838

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture of dyes and pigment
Process Description:	see pages 73-79 for basic, not NMP-specific process description

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2011
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3828838				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	pesticides, fertilizers and nitrogen compounds
Process Description:	see pages 73-79 for basic, not NMP-specific process description

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2011
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3828838

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture of paints, varnishes and similar coatings, printing ink
Process Description:	see pages 73-79 for basic, not NMP-specific process description

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2011
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
    High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3828838

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture of pharmaceuticals, medicinal chemicals and botanical product
Process Description:	see pages 73-79 for basic, not NMP-specific process description

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2011
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd,. 2017. Emission Scenario Document (ESD) on the use of textile dyes.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3828838

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (cosmetics)
Process Description:	see pages 73-79 for basic, not NMP-specific process description

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2011
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	White, D. L., Bardole, J. A.. 2004. Paint and finish removers.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3859417

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	>104 industries use finish removers. Finish removers are applied by brushing, spraying, troweling, flowing, or soaking. Cleaning the substrate may be by water rinse, wipe and let dry, or solvent rinse. Re-movers may be neutral, basic, or acidic. The viscosity may be water thin, thick enough to spray-on and cling, or a paste to be troweled on. liquid;
Possible Physical Form:	semipaste, water rinse finish remover
Chemical Concentration:	optimal = 40 to 50 mole percent ; Typical solution = 15 to 27.5wt percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	From trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	addresses variability and uncertainty
Overall Quality Determination[†]			High		1.3	

Continued on next page

Source Citation:	White, D. L.,Bardole, J. A.. 2004. Paint and finish removers.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3859417

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	White, D. L.,Bardole, J. A.. 2004. Paint and finish removers.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3859417

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	formulation of paint strippers
Process Description:	Finish removers may be manufactured in open or closed kettles. Closed kettles are preferred because they prevent solvent loss and exposure to personnel. To reduce emissions, condenser are often employed on vent stacks. Mild steel or black iron kettles are used for neutral or basic removers; stainless steel or reinforced polyethylene kettles are used for acidic removers. The kettles are heated to aid dispersion of paraffin waxes and mixing of other ingredients. Steel and polypropylene drums are used for industrial removers.
Number of Sites:	There are about 51 paint remover manufacturers in the United States.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	From trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	addresses variability and uncertainty

Continued on next page

Source Citation:	White, D. L.,Bardole, J. A.. 2004. Paint and finish removers.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3859417

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ashford, R. D.. 2001. Ashford's Dictionary of Industrial Chemicals N-methylpyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860437

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture
Process Description:	N-methylpyrrolidone is manufactured by combining ?-butyrolactone with methylamine. NMP is used in chemical synthesis, petrochemical extractions (aromatics, acetylene, butadiene), lubricating oil dearomatization, paint removers, and coatings.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	UK
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	Assessment or report does not document its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		Unacceptable		4	Metric Mean Score: 2.1.

Source Citation:	Ashford, R. D.. 2001. Ashford's Dictionary of Industrial ChemicalsN-methylpyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860437

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. PubChem: 1-Methyl-2-pyrrolidinone.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3860487	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Process Description:	Large-scale production of NMP is predominantly carried out by reacting gamma-butyrolacetone with an excess of pure or aqueous methyamine in a high-pressure tube reactor (6-12 Mpa). The reaction is exothermic and often run under adiabatic conditions with reactor temperatures in the range of 250-400 deg C. The resulting product mixture is decompressed and distilled. The NMP yield is normally more than 97 percent .
Total Annual U.S. Volume (and percent of PV):	100 million to 500 million pounds/yr (2002)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	From trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2002
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2016. Agent name: N-methyl-2-pyrrolidone.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3860491				

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	Used as resin in microelectronics industrial paint stripping; lube oil extraction; pesticides; coatings; **adhesives** dyes; pigments; polymers; polyurethane foam cleanup
Process Description:	Lists the life cycle stages and chemical - physical properties.

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIH information
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2016
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	underlying methods, data sources, and assumptions are not fully transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Petrochemical
Process Description:	Acetylene recovery from cracked gas, extraction of aromatics and buta-diene, gas purification (removal of CO2 and H2S)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	oldest source listed from 1999
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		High		1.5	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	plastics
Process Description:	Reaction medium for the production of high-temperature polymers such as polyethersulfones, polyamideimides, and polyaramids

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	oldest source listed from 1999
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		High		1.5	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics
Process Description:	Cleaning agent for silicon wafers, photoresist stripper, auxiliary in printed circuit board technology

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	oldest source listed from 1999
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		High		1.5	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture
Process Description:	Large-scale production of NMP is predominantly carried out by reacting gamma-butyrolacetone with an excess of pure or aqueous methyamine in a high-pressure tube reactor (6-12 Mpa). The reaction is exothermic and often run under adiabatic conditions with reactor temperatures in the range of 250-400 deg C. The resulting product mixture is decompressed and distilled. The NMP yield is normally more than 97 percent . It can also be produced by hydrogenation of N-hydroxymethyl-2-pyrrolidone or reaction of acrylonitrile with methylamine in the presence of a peroxide radical initiator.
Number of Sites:	12

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	oldest source listed from 1999
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion

Source Citation:	2017. Hazardous substances data bank: 1-Methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3860493

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.5	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3969286	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	coating (paints, writing inks); cleaning products (paint strippers, glue and grease removers, sealant removers); cosmetic and personal care products
Process Description:	Source is a high-level risk assessment for potential consumer exposure to NMP in consumer products.
Total Annual U.S. Volume (and percent of PV):	100 to 1000 tonnes (Australia)
Chemical Concentration:	5 percent (consumer prod limit in Europe); 0.3 percent (proposed new consumer prod limit)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	$\times$ 1	1	High quality - journal articles, etc
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	$\times$ 1	2	Australia
	Metric 3: Applicability	Low	$\times$ 2	6	non-occupational scenario that is similar to an occupational scenario
	Metric 4: Temporal Representativeness	High	$\times$ 2	2	2016
	Metric 5: Sample Size	Medium	$\times$ 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	$\times$ 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	$\times$ 1	1	well characterized
Overall Quality Determination†		Medium		1.8	

Source Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3969286

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2017. Inert details: N-methyl-2-pyrrolidinone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970073

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	pesticides
Process Description:	40 CFR 180.920 - indicates NMP is used in pesticides as a Solvent, cosolvent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	CFR
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2004
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Echa,. 2017. Substance information: 1-Methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970774

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	pH regulators and water treatment products and laboratory chemicals.
Process Description:	Substance information, including physical-chemical properties
Total Annual U.S. Volume (and percent of PV):	This substance is manufactured and/or imported in the European Economic Area in 10,000 to 100, 000 tonnes per year.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	ECHA substance database
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Europe
	Metric 3: Applicability	Medium	× 2	4	some of these uses were not identified by EPA
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Echa,. 2017. Uses as industrial sites: 1-Methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970775

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	Processing as intermediate; Formulation; Spray Application; Roll application; Brush application; Dip /pour; Lab; tableting, compression, extrusion, pelletization; Functional fluid; Lubrication at high energy conditions; cleaning
Process Description:	List of life cycle stages and worker activities (high-level, such as transfer or spraying)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	ECHA substance database
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Europe
	Metric 3: Applicability	High	× 2	2	all in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Echa,. 2017. Uses by professional workers: 1-Methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970776

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All (see above row)
Process Description:	Same information as 3970775

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	ECHA substance database
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Europe
	Metric 3: Applicability	High	× 2	2	all in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Echa,. 2017. Consumer uses: 1-Methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970777

EXTRACTION

Parameter	Data
Life Cycle Stage:	Consumer Use
Life Cycle Description (Subcategory of Use):	Printing
Process Description:	Indicates NMP is used in inks and toners by consumers

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECHA substance database
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.4	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 2014. Health hazard evaluation report no. HHE-2011-0099-3211, evaluation of employee exposures during sea lamprey pesticide application.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3974909	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Agricultural products
Process Description:	Employees manually applied pesticides into rivers to control sea lamprey larvae. Bayluscide wettable powder and emulsifiable concentrate are used. Technicians prepare equipment, then transport, mix, and apply pesticides into the river. Technicians also analyze river water samples in portable laboratories to measure pesticide concentrations throughout a treatment period. Mix Bayluscide wettable powder into water before pumping it into a maintenance application site
Operating Days per Year and Batches per Day:	38 employees
Possible Physical Form:	wettable powder and emulsifiable concentrate
Chemical Concentration:	The liquid Bayluscide concentrate contains N-methyl-2-pyrrolidone

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources (NIOSH HHE)
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Agriculutral use is in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2014
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty						

Source Citation:	Niosh,. 2014. Health hazard evaluation report no. HHE-2011-0099-3211, evaluation of employee exposures during sea lamprey pesticide application.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3974909				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	The report addresses variability and uncertainty in the results.
Overall Quality Determination†		High		1.0	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Argonne National, Laboratory. 2015. Lithium-ion battery production and recycling materials issues.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974981

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Batteries
Process Description:	NMP is used as a binder solvent in the assembly of lithium-ion batteries. (I think binders are used to adhere the electrolytic cells to the battery).

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	not from trusted sources, but do not seem flawed
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2015
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Assessment or report provides results, but the underlying methods, data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1997. Full public report: Polymer in byk-410.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3978356	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	polymer
Process Description:	NMP is the solvent in which the polymer is dispersed. The NMP-polymer solution is added to coatings and serves to affect the rheological properties of the coating
Total Annual U.S. Volume (and percent of PV):	2,750 kg of NMP-polymer soln imported to Australia for use
Chemical Concentration:	45 percent NMP; 55 percent polymer

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information from industry contact. Not standard trusted source but no flaws identified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1997
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	sources are not fully transparent, due to confidentiality of industry contact
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Medium		2.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1997. Full public report: Polymer in byk-410.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3978356	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	coating /paint formulation
Process Description:	The mentioned NMP-polymer soln is added to coatings such that it (NMP is 45 percent in NMP-polymer disp) is added to coatings at a concentration of 0.1-3wt percent (corresponds to 0.45 to 1.35 percent NMP)
Total Annual U.S. Volume (and percent of PV):	2,750 kg of NMP-polymer soln imported to Australia for use
Chemical Concentration:	0.45 to 1.35 percent NMP in coating/paint

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information from industry contact. Not standard trusted source but no flaws identified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1997
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Medium	× 1	2	sources are not fully transparent, due to confidentiality of industry contact
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination[†]			Medium		2.2	

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Source Citation:	Nicnas,. 1997. Full public report: Polymer in byk-410.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978356

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EXTRACTION

Parameter	Data
Life Cycle Stage:	Formulation
Life Cycle Description (Subcategory of Use):	polymeric adhesive for leather coating application
Process Description:	Adhesive will be decanted or pumped into a stainless steel mixing vessel, mixed with other components such as pigment, defoamer, thickener and water. Formulation is gravity fed or pumped into 200 litre drums or 20 litre pails and transported to the spray line (or customers).
Total Annual U.S. Volume (and percent of PV):	Up to 40 tonnes/yr of polymer in formulation (polymer is 35 percent; NMP is 5 percent)
Chemical Concentration:	5 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Information is from trusted sources
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia
Metric 3:	Applicability	High	× 2	2	Adhesive formulation is in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†		Medium		1.7	

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3978357	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	polymeric adhesive for leather coating application
Process Description:	Formulation is pumped directly from drums or pails to spray unit. The formulation will be applied by rotary spray application to untreated leather on a conveyor line, and the treated leather will then be dried in ovens through a drying tunnel prior to further treatment. Any overspray is filtered and caught in a water curtain filtering system during the spray application.
Total Annual U.S. Volume (and percent of PV):	Up to 40 tonnes/yr of polymer in formulation (polymer is 35 percent ; NMP os 5 percent)

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Information is from trusted sources
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	Australia
	Metric 3:	Applicability	High	× 2	2	Adhesive use is in scope
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†			Medium		1.7	

Source Citation:	Nicnas,. 2001. Full public report: Polymer in primal binder u-51.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978357

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3978358	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coating /additive in Papermaking
Process Description:	Polymer in NMP is imported to Australia in 50 kg to 1 tonne containers for use in the paper and building industries. Polymer may be used as a surface or internal treatment for paper and paper type products. The product containing the notified polymer is transferred to a mixing tank, which may have a holding capacity of up to 1,000 L. Product will then be diluted significantly with water and applied to paper using rollers and spray equipment. As internal paper treatment, the notifier states that the product containing the notified polymer will be added to the paper pulp following the washing and bleaching process, but before rolling and cutting of the final paper product.
Total Annual U.S. Volume (and percent of PV):	2500 kg polymer-NMP soln imported to Australia for use; assumed 2,000 kg/yr for paper
Number of Sites:	1 (assumed)
Operating Days per Year and Batches per Day:	300 days/yr (assumed)
Chemical Concentration:	30 percent polymer & 10 to < 30 percent NMP in soln that is diluted prior to use at paper mill

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information from industry contact. Not standard trusted source but no flaws identified.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	High	× 2	2	This was not identified as a use by EPA, but no uses are excluded from scope. May be applicable to coating OES?
	Metric 4: Temporal Representativeness	Low	× 2	6	1998

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Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3978358				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	sources are not fully transparent, due to confidentiality of industry contact
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Medium		2.2	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978358

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	architectural (concrete) coating
Process Description:	product containing the notified polymer usually will be applied by brush hence dermal and accidental ocular exposure may occur. The polymer is used at 2.5 g.m-2.
Total Annual U.S. Volume (and percent of PV):	2500 kg polymer-NMP soln imported to Australia for use; Assumed 500 kg/yr for coating
Chemical Concentration:	5 to 10 percent solution containing polymer & NMP in coating

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information from industry contact. Not standard trusted source but no flaws identified.
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	1998
Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	sources are not fully transparent, due to confidentiality of industry contact
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion
Overall Quality Determination†		Medium		2.2	

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Source Citation:	Nicnas,. 1998. Full public report: Copolymer in foraperle 321.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978358

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha,. 2006. OSHA permissible exposure limit and general information: n-methyl-2-pyrrolidinone.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3981001	

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Process Description:	Physical chemical properties; health effects; lab sampling method

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	OSHA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Information is not related to a life cycle stage, but is broadly applicable
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	N-Methylpyrrolidone Procedures Group, Inc. 2006. N-methyl 2-pyrrolidone (NMP) considerations against use in cosmetics, toiletries, and personal care products.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981020

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Pharmaceutical
Process Description:	NMP was used in cosmetics, toiletries, and personal care products. The EU banned this use and prohibited the general public from using non-cosmetic products containing >=5 percent NMP.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	× 2	8	Pharmaceutical use is a non-TSCA use. Reported use is cosmetics; therefore, out of scope.
	Metric 4:	Temporal Representativeness	Medium	× 2	4	2006
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination[†]			Unacceptable		4	Metric Mean Score: 2.8.

Source Citation:	N-Methylpyrrolidone Procedures Group, Inc. 2006. N-methyl 2-pyrrolidone (NMP) considerations against use in cosmetics, toiletries, and personal care products.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981020

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacturing
Process Description:	produces high-purity, high-grade NMP from maleic anhydride in an integrated production process.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metal finishing; Electronics
Process Description:	Electronics: Wax, flux removal. Burr removal. Electronic parts cleaning. Semiconductor parts cleaning. Solvent for lithium battery manufacturing. Semiconductor photo-resist thinner. Color filter photo-resist thinner

EVALUATION

Domain		Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			High		1.6	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3981028				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Automotive care
Process Description:	Mold cleaning. Metal (parts) cleaning.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Petrochemical
Process Description:	Extract agent (acetylene, BTX, butadiene).

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	intermediate
Process Description:	Reaction solvents (PPS, polyimide, etc.)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Mitsubishi, Chemical. 2017. NMP/N-methyl-2-pyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning
Process Description:	Plastic lens manufacturing equipment cleaning. Equipment washing.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	NMP MFG site is in Japan
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Johnson Matthey Process, Technologies. 2017. N-methyl-2-pyrrolidone (NMP).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981029

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Process Description:	Contains PFD and reaction sequences. Our technology generates high-quality NMP by reacting gamma-butyrolactone (GBL) and monomethylamine (MMA), which are products of our butanediol and methylamines processes, respectively. Additional process description available.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	Low	× 1	3	Unknown - could be US based or other countries
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	Data sources not transparent
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			Medium		1.7	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bpi,. 2017. NMP free water borne polyurethane dispersions.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981030

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Coatings
Process Description:	N-Methyl-2-Pyrrolidone (NMP) is the most common co-solvent used in the manufacture of waterborne polyurethane dispersions. The unique properties of NMP aid in both the processing of the polyurethane dispersions as well as the flim formation of the applied polyurethane coating. In addition, the NMP can help with substrate wetting, freeze/thaw stability, and adhesion to some substrates.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Unknown - could be US based or other countries
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		Medium		1.7	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Spin,. 2017. SPIN substances in preparations in nordic countries1-methyl-2-pyrrolidon.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981132

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Process Description:	Lists applicable Nordic NAICS equivalents. List of uses in nordic countries, in generic terms (i.e., degreasers, paints, laquers and varnishes, etc.).
Total Annual U.S. Volume (and percent of PV):	lists nordic PV for each use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Nordic substance database
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Norway, Finland, other OECD member countries
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	European Chemicals, Agency. 2016. 1-methyl-2-pyrrolidone brief profile.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981148

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture or import
Total Annual U.S. Volume (and percent of PV):	10,000-100,000 tonnes/yr (EU)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	not from trusted sources, but do not seem flawed
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Europe
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2016
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Assessment or report provides results, but the underlying methods, data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		Medium		2.0	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1990. Technical information: N-methylpyrrolidone handling and storage.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982070

EXTRACTION

Parameter	Data
Life Cycle Stage:	All
Life Cycle Description (Subcategory of Use):	All
Process Description:	Physical chemical properties; lab analysis methods; biodegradability and aquatic toxicity; lists proper storage and equipment that should be used for NMP. NMP can be handled in carbon steel, stainless steel or nickel equipment. Aluminum is suitable for NMP service at ambient temperatures, only. Storage at ambient temperatures will not affect NMP. Cool storage conditions and light paint on aboveground tanks decrease evaporative losses.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Information is not related to a life cycle stage, but is broadly applicable
	Metric 4: Temporal Representativeness	Low	× 2	6	1990
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		Low		2.3	

Source Citation:	Basf,. 1990. Technical information: N-methylpyrrolidone handling and storage.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982070

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Turi,. 1996. N-methyl pyrrolidone: Chemical profile.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3982071	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Process Description:	NMP is manufactured mainly by condensing butyrolactone with methylamine. It may also be made by high pressure synthesis from acety-lene and formaldehyde. Separation of the water and NMP is generally achieved by distillation.
Chemical Concentration:	at least 99.8

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	data or techniques that are high quality
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	1996
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination[†]		High		1.6	

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Turi,. 1996. N-methyl pyrrolidone: Chemical profile.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982071

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	paint stripping accounts for only 10-15 percent
Total Annual U.S. Volume (and percent of PV):	10-15 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	data or techniques that are high quality
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1996
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion
Overall Quality Determination†			Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1998. Cleaner technologies substitutes assessment for professional fabricare processes: Appendix F: Chemical volume estimates: Screen printing CTSA.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982072

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	screen printing - cleaning of screens
Total Annual U.S. Volume (and percent of PV):	38,000 gal NMP used in screen cleaning/yr
Number of Sites:	20,000 screen printing facilities
Batch Size:	screen size and additional parameters to determine chemical cleaning throughput in Table F-1
Operating Days per Year and Batches per Day:	assumed 252 days/yr
Site Daily Throughput:	57 percent of facilities clean one to ten screens, or an average of 5.5 a day.
Possible Physical Form:	liquid
Chemical Concentration:	35 percent NMP in solution used to clean screens

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	USEPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	1998
Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion

Source Citation:	U.S, E. P. A.. 1998. Cleaner technologies substitutes assessment for professional fabricare processes: Appendix F: Chemical volume estimates: Screen printing CTSA.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982072

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	University of, Minnesota. 2007. Safter stripping and cleaning chemicals for coatings & polymers.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3982073				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	alternative stripping methods include: abrasive blasting, water blasting, scraping, sanding, tumbling, burn off and cold shock

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	not from trusted sources; however, associated information does not indicate flaws or quality issues
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	in scope
Metric 4:	Temporal Representativeness	Medium	× 2	4	2007
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	3982074	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	immersion degreasing
Process Description:	Degreasing with NMP entails the immersing of an oil coated metal part into a heated bath of NMP, where the oil is solubilized. Upon removal from the cleaning bath, the part is immersed into a second heated bath, to remove the oil contaminated NMP from the metal surface. The second, or rinse bath, can be filled with either NMP or water. Drying the rinse liquid from the metal part is required.
Batch Size:	10 complete cleaning cycles/hr; 5.0 lbs of parts cleaned per cycle
Possible Physical Form:	liquid

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	not from trusted sources, but do not seem flawed
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Cleaning is included in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1993
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Assessment or report provides results, but the underlying methods, data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion

Source Citation:	Basf,. 1993. Modification of a vapor degreasing machine for immersion cleaning use N-methylpyrrolidone.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982074

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination[†]		Medium		2.2	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Erg,. 2000. Preferred and alternative methods for estimating air emissions from paint and ink manufacturing facilities.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982076

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Paint and ink formulation
Process Description:	Paint and ink manufacturing can be classified as a batch process and generally involves the blending/mixing of resins, pigments, solvents, and additives. Traditional paint and ink manufacturing consists of four major steps: Preassembly and premix; Pigment grinding /milling /dispersing; Product finishing/blending; and Product filling/packaging (Fisher et al., 1993).

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	From trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2000
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Larranaga, M. D., Lewis, R. J., Lewis, R. A.. 2016. Hawley's Condensed Chemical DictionaryN-methyl-2-pyrrolidone.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3982124				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Solvent for resins, acetylene, etc., pigment dispersant, petroleum processing, spinning agent for polyvinyl chloride, microelectronics industry plastic solvent applications, intermediate.
Process Description:	lists physical chemical properties and uses of NMP

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	Hawley's Condensed Chemical Dictionary
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	all uses are in scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2016
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Low	× 1	3	underlying data source are not fully transparent.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Technikon, L. L. C.. 2001. Core box cleaner study: Evaporative emission study of specialty systems' solvent FC-47-G1.			
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;			
Hero ID	3982183			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning of casts /molds and hoppers in foundry applications
Process Description:	Cleaning to remove sand from casting and molding equipment. Solvent is sprayed onto casts /molds at 80-90 psi, rate of 0.08-0.27 gal/min. Solvent allowed to soak for 20 mins, then removed when the next part is molded and removed. Solvent sprayed on hoppers, soaked for 2-13 hours, chipped off.
Batch Size:	Molds = 0.5-1.2 gal of solvent /mold /day; Hoppers = 4.0-5.4 gal/ hopper/day
Chemical Concentration:	NMP at unknown concentration

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	High quality techniques
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2001
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.3	

Source Citation:	Technikon, L. L. C.. 2001. Core box cleaner study: Evaporative emission study of specialty systems' solvent FC-47-G1.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982183

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oehha,. 2007. Occupational health hazard risk assessment project for California: Identification of chemicals of concern, possible risk assessment methods, and examples of health protective occupational air concentrations.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3982225				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing
Total Annual U.S. Volume (and percent of PV):	>100M-500M

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	data or techniques that are high quality
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2002
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	clearly documents its data sources
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	addresses variability and uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Parameter	Data

Source Citation: Ec,. 2004. Effectiveness of vapour retardants in reducing risks to human health from paint strippers containing dichloromethane.

Type of Data Source Facility; Reports for Data or Information Other than Exposure or Release Data;

Hero ID 3982358

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Chemical Concentration:	5-20 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	trusted sources
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Belgium
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	2004
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Data sources are generally described but not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion
Overall Quality Determination†		Medium		1.8	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Erm,. 2017. Life cycle assessment of used oil management.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3982372				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Petrochemical
Process Description:	NMP can be used for re-refining of used oil to produce lube base oil. Some process information on pg 70, but confidentiality claims make it difficult to know the process used.
Batch Size:	0.06 kg NMP/1 kg of processed used oil

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	The assessment or report uses high quality data and/or techniques that are not from trusted sources; however, Associated information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	in scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Assessment or report provides results, but the underlying methods, data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	well characterized
Overall Quality Determination†		High		1.6	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2013. Fact sheet: N-Methylpyrrolidone (NMP).				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986610				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint and Coating Removal
Process Description:	Indicates that Gloves made of butyl rubber or laminated polyethylene/ EVOH are resistant to NMP. Does not list customary PPE.
Total Annual U.S. Volume (and percent of PV):	9 percent of 184 million lbs/yr

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	The data, data sources, and/or techniques used in the assessment or report are not specified.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	No date
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	Assessment or report does not document its data sources, assessment methods, and assumptions.
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination[†]			Unacceptable		4	Metric Mean Score: 2.4.

Source Citation:	U.S, E. P. A.. 2013. Fact sheet: N-Methylpyrrolidone (NMP).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986610

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	McCormick, L. 2017. Comment submitted by Lindsay McCormick, Chemicals and Health Project Manager on behalf of Environmental Defense Fund (EDF). EDF.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986675				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	coating
Chemical Concentration:	<5 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	McCormick, L. 2017. Comment submitted by Lindsay McCormick, Chemicals and Health Project Manager on behalf of Environmental Defense Fund (EDF). EDF.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986675

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripper /removers
Chemical Concentration:	25-50 percent ; 10-15 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Holmes, L. 2017. Comment submitted by Laurie Holmes, Senior Director, Environmental Policy, Motor & Equipment Manufacturers Association (MEMA). Motor & Equipment Manufacturers Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986676

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Adhesive
Process Description:	NMP is used during the motor vehicle component manufacturing process as an adhesive (added as a viscosity aid). It may also be used in inks, varnishes, paint thinners, paint primers, paint removers, paste, lacquer, and solvents. When NMP is used as a viscosity aid in an adhesive in automotive applications, the chemical is cured and there is no solvent remaining.

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]			High		1.1	

Source Citation:	Holmes, L. 2017. Comment submitted by Laurie Holmes, Senior Director, Environmental Policy, Motor & Equipment Manufacturers Association (MEMA). Motor & Equipment Manufacturers Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986676

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Thomas, T. 2017. Comment submitted by Todd Thomas, ELANTAS PDG, Inc. (EPDG).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986789

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing /Use
Life Cycle Description (Subcategory of Use):	Polymers and Electronics (wires)
Process Description:	Functional Uses: Reaction medium for the manufacture of high temperature polymers; Solvent and/or diluent for synthesis of wire enamels and related intermediates; Dye solutions for use in wire coatings; Process vessel cleaning solvent; Limited use as an industrial cleaning solvent strictly in the wire coating industry; Limited use as a cleaning solvent in regulated metal parts washer applications; Limited use as a flexibilizer for B-Stage coatings (i.e., dried but not cured)
Total Annual U.S. Volume (and percent of PV):	EPDG used the following weights (in pounds) by year going back to 2014:- 2014 1,606,040- 2015 1,481,993- 2016 1,253,048

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type

Source Citation:	Thomas, T. 2017. Comment submitted by Todd Thomas, ELANTAS PDG, Inc. (EPDG).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986789

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Brown, T; Bennett, S. 2017. Comment submitted by Timothy Brown, Regulatory Counsel and Steven Bennett, Vice President of Scientific Affairs, Consumer Specialty Products Association (CSPA). Consumer Specialty Products Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986792

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	metal finishing
Process Description:	CSPA notes industrial/commercial use of N-methylpyrrilidone as penetrant used for determination of metal fatigue for turbines, bridges, and other critical uses, for inspections of metal fatigue, welding cracks, etc.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.1	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986795

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacture/import
Total Annual U.S. Volume (and percent of PV):	The CDR submissions data for 2011 through 2015, inclusive, report an average annual U.S. production (domestic manufacture plus imports) of 170 million pounds per year, with a range from 160 to 187 million pounds. During this same time period, imports from China rose sharply to four million pounds, more than 2 percent of total U.S. production.
Number of Sites:	four companies producing NMP in the United States according to CDR and other data: Ashland (in Texas City, TX), BASF (Geismar, LA), Eastman (Fieldale, VA), Lyondell (Channelview, TX)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986795

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.1	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986795

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paints, coatings, adhesives
Chemical Concentration:	5-7 percent ; 0.25-0.5 percent ; <4 percent ; 8-12 percent ; 1-2.5 percent ; 0.3-1 percent ; 5-10 percent ; 1.6 percent ; 2.5-10 percent ; 1-2.5 percent ; 1-2.5 percent ; 0.1-1 percent ; 0.1-1 percent ; 0.1-1 percent ; 0.1-1 percent ; 1-3 percent ; 1-2.5 percent ; 2.5-10 percent ; 1-3 percent

EVALUATION

Domain		Metric	Rating	MWF★	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†			High		1.3	

★ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986795				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Pesticides
Process Description:	Dog flea and tick remover
Chemical Concentration:	30-47 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	$\times$ 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	$\times$ 1	1	US
	Metric 3: Applicability	Medium	$\times$ 2	4	Pesticide not in scope of TSCA; however, information is applicable to formulation
	Metric 4: Temporal Representativeness	High	$\times$ 2	2	2017
	Metric 5: Sample Size	Medium	$\times$ 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	$\times$ 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	$\times$ 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986795

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaners
Chemical Concentration:	100 percent ; 100 percent ; 5-10 percent ; <1 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	MacRoy, P. 2017. Comment submitted by Patrick MacRoy on behalf of Environmental Health Strategy Center et al.. Environmental Health Strategy Center.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986795				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripper /removers
Chemical Concentration:	50 percent ; 10-20 percent

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From environmental organization. No bias /errors evident with respect to this information.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics - Photoresist Stripping
Process Description:	NMP is used as a solvent in circuit board manufacturing in photoresist stripping. Some facilities report that photoresist stripping occurs in batches; others report continuous processing. The NMP used in the process is up to 100 percent concentration, is in liquid or liquid spray form, and is heated up to 85 "F. Facilities report that storage can be in 55-gallon drums, totes, or one to five gallon bottles.
Chemical Concentration:	up to 100 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics - Soldermask Stripping
Process Description:	Liquid NMP (up to 99.9 percent concentration) is used to remove solder mask in circuit boards. Solder mask stripping typically occurs as a batched process in an open topped tank equipped with ventilation. The NMP used is reportedly at ambient temperature or heated up to 180"F. The NMP used in the process is typically stored in 55-gallon drums or one to five gallon containers.
Chemical Concentration:	up to 99.9 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]			High		1.3	

Continued on next page

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Process Description:	NMP is a carrier solvent used to uniformly apply a polymer to manufacture an industrial membrane. The polymer and NMP are mixed as batches in a steel tank with controlled releases and local ventilation, followed by application of the polymer solution and extraction of the NMP in a water bath. The NMP used in the process is greater than 50 percent concentration in liquid form and is heated. NMP can be stored in tanks, bulk containers, totes, or drums.
Chemical Concentration:	greater than 50 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Fertilizer application
Process Description:	NMP is a solvent used in the production of a fertilizer additive that prevents the volatilization of urea (as ammonia). As further detailed below, fertilizer additive products that may contain NMP are controlled and finished fertilizers that have such small amounts of NMP, it would be an unnecessary expenditure of EPA"s time to evaluate them for further regulatory restriction.
Chemical Concentration:	15-45 percent in additive; 0.1 percent in final product

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation and distribution
Process Description:	NMP is often handled by distributors that blend and package products containing NMP, such as industrial paint stripper formulations or industrial surface cleaning blends. On site, NMP is stored in tanks, totes, drums, or tank trucks. Within the distribution facility, NMP is processed in mixers and tanks within closed and controlled release systems. Processing is typically batched. The NMP is in the liquid form at ambient or increased temperature.
Chemical Concentration:	5-100 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability

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Source Citation:	Roberts, KM. 2017. Comment submitted by Kathleen M. Roberts, N-Methylpyrrolidone (NMP) Producers Group Manager, NMP Producers Group, Inc.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986796

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Gerber, JM. 2017. Comment submitted by Jonathan M. Gerber, Advanced Regulatory Specialist, 3M Medical Department, Toxicology & Compliance Solutions 3M Center, Part 2. 3M Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986797

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints, coatings, adhesives
Chemical Concentration:	0.5 percent ; 5-15 percent ; <5 percent ; <1.5 percent ; <0.5 percent ; <14 percent ; <1 percent ; 1-5 percent ; <0.5 percent

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Gerber, JM. 2017. Comment submitted by Jonathan M. Gerber, Advanced Regulatory Specialist, 3M Medical Department, Toxicology & Compliance Solutions 3M Center, Part 2. 3M Center.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986797

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Printing Inks
Chemical Concentration:	5-10 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]		High		1.3	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Riegle, L. 2017. Comment submitted by Leslie Riegle, Director of Environmental Policy Aerospace Industries Association (AIA), Part 3. Aerospace Industries Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986798

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	Specific aerospace industrial uses include but may not be limited to: solvents for both cleaning and removal of coatings (in electronics as well as for use with specific coatings and applications); as a constituent in adhesives, release agents, inks, coatings (including topcoats, primers and specialty coatings) surface pretreatments; as well as a sealant for sensitive military aircraft applications.
Chemical Concentration:	15-35 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†			High		1.3	

Source Citation:	Riegle, L. 2017. Comment submitted by Leslie Riegle, Director of Environmental Policy Aerospace Industries Association (AIA), Part 3. Aerospace Industries Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986798

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Anonymous. 2017. Anonymous public comment, Part 7.		
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;		
Hero ID	3986799		

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Process Description:	NMP is imported as a dispersant liquid for polymer particles. NMP solution is applied by gravure to form a polymer film. NMP is dried and captured for recycle/reuse.
Total Annual U.S. Volume (and percent of PV):	<1 metric ton; max. of <20 metric ton/yr
Number of Sites:	6 companies in the US that use NMP this way

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	Anonymous comment - data, data sources, and/or techniques used in the assessment or report are not specified
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Davis, R. 2017. Comment submitted by Raleigh Davis, Assistant Director, Environmental Health and Safety, American Coatings Association (ACA), Part 2. American Coatings Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986800

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints, coatings, adhesives
Process Description:	NMP is used as a coalescing aid in antistatic applications. NMP is used in wax dispersions technology, allowing coatings systems to im-prove the dispersions of pigments. NMP is used as a rheology additive to control the viscosity of urethane coatings in the process of making aque-ous dispersions. NMP is capable of dissolving polymers that are difficult to process.
Chemical Concentration:	0.5 percent ; <1 percent ; 5-15 percent ; 1-5 percent ; 0.1-1 percent ; <0.1 percent ; 1-5 percent ; 45-60 percent ; 5-10 percent ; 1-5 percent ; 0.1-1 percent ; <2 percent ; <1.5 percent ; <0.2 percent ; 10-50 percent ; 1-5 percent ; 0.1-1 percent ; 1-5 percent ; <5 percent ; <1.5 percent ; <0.5 percent ; <14 percent ; 1-2 percent ; 0.8-2.1 percent ; 2-3 percent ; 0.2-2 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Trade association poll of manufacturers. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source

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Source Citation:	Davis, R. 2017. Comment submitted by Raleigh Davis, Assistant Director, Environmental Health and Safety, American Coatings Association (ACA), Part 2. American Coatings Association.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986800

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Isaacs, D. 2017. Comment submitted by David Isaacs, Semiconductor Industry Association (SIA).				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986801				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - semiconductor manufacturing
Process Description:	The semiconductor industry uses NMP in manufacturing for three main purposes:1. Dedicated solvent in certain photolithography formulations, including photoresists, Bottom Anti-Reflective Coatings (BARC) and polyimides2. Solvent pre-wet of wafers prior to application of spin on polymer3. Component of photoresist stripper formulations.
Chemical Concentration:	No NMP is present in the final polyimide film.

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Trade association poll of manufacturers. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.1	

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Rudnick, M. 2017. Comment submitted by Michelle Rudnick, Senior Manager Regulatory Affairs, CRC Industries, Inc., Part 2. CRC.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986802

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	paint stripper /removers
Process Description:	CRC uses NMP in two gasket remover aerosol products and one graffiti remover aerosol product. To use the product, we recommend that the surface be coated with the graffiti remover product and allowed to sit for 5 minutes. The paint can then be wiped or scraped off.
Batch Size:	3 oz (1/4 of a can) for the average gasket
Chemical Concentration:	<=20 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†			High		1.3	

Source Citation:	Rudnick, M. 2017. Comment submitted by Michelle Rudnick, Senior Manager Regulatory Affairs, CRC Industries, Inc., Part 2. CRC.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986802

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	National Electrical Manufacturers Association. 2017. Comment submitted by National Electrical Manufacturers Association (NEMA).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986803

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - magnet wires
Process Description:	The magnet wire industry has long utilized NMP as a solvent/diluent in high-performance magnet wire enamels, thinners, and cleaners. Specifically, magnet wire plays a critical role in three areas of energy transformation through its use today in transformers, motors and generators. In the magnet wire industrial process a copper or aluminum wire is routed through an applicator of solvent-based enamel coating. NMP does not react with the other ingredients in this coating, but is simply mixed in to facilitate the smooth application of the enamel.
Chemical Concentration:	80-85 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability

Source Citation:	National Electrical Manufacturers Association. 2017. Comment submitted by National Electrical Manufacturers Association (NEMA).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986803

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Haas, G. 2017. Comment submitted by Gerhard Haas, Vice President, Research & Development, Technical Service, Purchasing, Jowat Corporation, Part 2. Jowat Corporation.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986804

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	coating
Process Description:	Primer which promotes adhesion. The NMP containing primer is applied with a slot die and then dried in a heat tunnel.
Total Annual U.S. Volume (and percent of PV):	imported 85000lbs of the primer last year which contained a total of 4250 lbs of NMP
Chemical Concentration:	<5 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Turner, S. L., McCrillis, R. C.. 2017. Evaluation of alternative chemical strippers on wood furniture coatings.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986887				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint stripper
Process Description:	Solvent strippers work solely by dissolving the coating film. Their dissolving mechanism causes them to become rapidly saturated with dissolved coating.
Batch Size:	1.74 to 3.23E-04 m3 of stripper per m2 of substrate surface
Chemical Concentration:	50-75 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	The assessment or report uses high quality data and/or techniques that are not from trusted sources; however, Associated information does not indicate flaws or quality issues.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	Low	× 2	6	No date
	Metric 5: Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Assessment or report provides results, but the underlying methods, data sources, and assumptions are not fully transparent.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The report does not address variability or uncertainty.
Overall Quality Determination[†]		Medium		2.2	

Source Citation:	Turner, S. L.,McCrillis, R. C.. 2017. Evaluation of alternative chemical strippers on wood furniture coatings.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986887

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1988. PRODUCTION EXPOSURE PROFILE N-METHYLPYRROLIDONE.			
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;			
Hero ID	4214097			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacturing
Total Annual U.S. Volume (and percent of PV):	BASF production in 1987 estimate of 15-25 million lbs/yr, no known volume for second producer, no imports
Number of Sites:	2

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Manufacturing in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	1988
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Data sources are included
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1988. PRODUCTION EXPOSURE PROFILE N-METHYLPYRROLIDONE.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214097

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation
Process Description:	Processing NMP into paint stripper formulations.
Number of Sites:	6
Chemical Concentration:	<=49

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Manufacturing in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1988
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources are included
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMITTING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACHMENT.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214100

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Processing as a reactant
Process Description:	Several industrial applications including dissolving organic polymers and monomers for manufacture of synthetic fibers, resins, composite materials and film coatings.
Total Annual U.S. Volume (and percent of PV):	55 million lbs/yr in 1989
Number of Sites:	1
Site Daily Throughput:	Daily use unknown. Annual use of 1.6 million lbs/yr in 1989

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Processing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data is from source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			Medium		1.7	

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Source Citation:	E. I. Dupont De Nemours,Co,. 1990. LETTER FROM E I DUPONT DE NEMOURS & COMPANY TO USEPA SUBMIT-TING COMMENTS CONCERNING THE PROPOSED TEST RULE ON N-METHYLPYRROLIDONE WITH ATTACH-MENT.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.			
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;			
Hero ID	4214135			

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacturing
Process Description:	Continuous reaction process forms NMP by the condensation of gamma-butyrolactone with methylamine followed by distillation to remove water.
Total Annual U.S. Volume (and percent of PV):	56 million lbs/yr manufactured in 1989 New facility expected to produce 20 million lb/yr starting in 1990. 3 million lbs/yr imported in 1986 and 1987
Number of Sites:	2 in 1989, 3 in 1990

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	Manufacturing in scope
	Metric 4:	Temporal Representativeness	Low	× 2	6	1989
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]			High		1.6	

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	4214135

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1989. SUMMARY ENGINEERING REPORT TEST RULES EXPOSURE ANALYSIS N-METHYLPYRROLIDONE WITH COVER LETTER DATED 110189.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	4214135				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paint and coatings use and removers
Process Description:	Stripper applied to surface by spraying or brushing or dipping. Time given to penetrate. Stripper removed, wiped or scraped.
Total Annual U.S. Volume (and percent of PV):	5.5 - 8.3 million lbs/yr in 1989
Number of Sites:	200-500 facilities

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Manufacturing in scope
	Metric 4: Temporal Representativeness	Low	× 2	6	1989
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data sources included
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Midwest Research Institute (MRI). 1998. Emission Factor Documentation for AP-42. Section 9.2.1: Fertilizer Application. Draft Report.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	5097883				

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Fertilizer application
Process Description:	Methods of application are detailed in Section 2.2. Although many types of fertilizers are manufactured, the basic application methods depend on whether the fertilizer is in gaseous, fluid, or solid form. Methods for application of each of these three forms of fertilizer are discussed.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Prepared for EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	1998
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Assessment or report clearly documents its data sources, assessment methods, results, and assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Includes discussion of limitations to these estimates/information
Overall Quality Determination†		High		1.3	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nondestructive Testing (NDT) Resource Center. 2017. What is NDT?.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5097890

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Metal finishing
Process Description:	A nondestructive evaluation (NDE) method would not only locate a defect, but it would also be used to measure something about that defect such as its size, shape, and orientation. NDE may be used to determine material properties, such as fracture toughness, formability, and other physical characteristics

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Data sources not specified
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	not fully transparent
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
   High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Kemira. 2018. RE: N-Methylpyrrolidone (NMP) (CASRN 872-50-4). EPA-HQ-OPPT-2016-0743-0085.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176404

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing) n-Methylpyrrolidone (NMP) is an industrial solvent that is used in a very narrow application. Specifically, it is the preferred solvent for phenothaizine (PTZ), the short-stop chemical for glacial acrylic acid (GAA) and glacial methamlic acid (GMA). In case of an uncontrolled polymerization within the storage tank, the PTZ can be injected in an attempt to stop this reaction and prevent a tank rupture.
Process Description:	
Chemical Concentration:	65 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Variability and uncertainty in concentration not addressed.
Overall Quality Determination[†]		High		1.4	

Source Citation:	Kemira. 2018. RE: N-Methylpyrrolidone (NMP) (CASRN 872-50-4). EPA-HQ-OPPT-2016-0743-0085.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176404

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	JSR and JSR Micro Inc.. 2017. Comments on the preliminary information on manufacturing, processing, use, and disposal: N-Methylpyrrolidone (NMP). EPA-HQ-OPPT-2016-0743-0064.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176405

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	electronics
Process Description:	NMP is essential as a solvent in alignment film coatings because polyimide is soluble in very few other solvents. Used for LCD screen manufacturing. Alignment film coating is printed on the glass and baked to remove various solvents. The volatile NMP during pre-bake and post-bake process are removed by air emission abatement devices.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]			High		1.1	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	FUJIFILM Electronics Materials USA Inc.. 2017. NMP Use/Application Survey FFEM/FEUP. EPA-HQ-OPPT-2016-0743-0024.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176406

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - semiconductor manufacturing
Process Description:	Processing aid that is not intended to become part of the final product; Reactant (i.e., used by itself or with other monomers to synthesize another substance); Formulant/additive; Cleaner/degreaser/surface prep agent. Bulk containers, totes, drums, and bottles.
Number of Sites:	2 - Texas and California
Batch Size:	batch process
Chemical Concentration:	10-100 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†		High		1.3	

Continued on next page

Source Citation:	FUJIFILM Electronics Materials USA Inc.. 2017. NMP Use/Application Survey FFEM/FEUP. EPA-HQ-OPPT-2016-0743-0024.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176406

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments

⋆ MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Saft American Inc.. 2017. Memorandum to EPA: N-methylpyrrolidone, docket ID number EPA-HQ-OPPT-2016-0743. EPA-HQ-OPPT-2016-0743-0005.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	5176407	

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - batteries
Process Description:	NMP is used in the Saft "mixing" process whereas raw powder chemicals, solvent (NMP), binder and substrates are combined to form a positive mix.
Total Annual U.S. Volume (and percent of PV):	In 2016 the Cockeysville plant used 46,022.69 kg. While the Jacksonville plant used 296,651 kg

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			High		1.1	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	North America's Building Trades Unions (NABTU). 2017. Re: TSCA scoping and review: Ten priority chemicals. EPA-HQ-OPPT-2016-0743-0023.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176408

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	all - list of uses in the construction industry
Process Description:	adhesives and sealants; cleaners; coatings; strippers; Soldering flux, which cleans oxidation from metals; wood preservatives

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Trade association poll of manufacturers. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		High		1.1	

[*] MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Celanese Engineered Materials. 2017. N-methylpyrrolidone (NMP) CASRN: 872-50-4, use, disposal and exposure scenarios. EPA-HQ-OPPT-2016-0743-0015.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176410

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Process Description:	NMP is a solvent critical to manufacturing high-temperature polymer Polyphenylene sulfide (PPS). NMP is a solvent used to dissolve monomers allowing for a polymerization reaction. After use as a reaction solvent, NMP is recovered in multiple distillation columns and recycled back to storage tanks for reuse.
Total Annual U.S. Volume (and percent of PV):	26.2 million lbs of PPS; 2,425,000 lbs of NMP in 2016
Chemical Concentration:	Residual NMP measured is below 17 ppm

EVALUATION

Domain	Metric		Rating	MWF⋆	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	From chemical manufacturing company. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination†			High		1.3	

Source Citation:	Celanese Engineered Materials. 2017. N-methylpyrrolidone (NMP) CASRN: 872-50-4, use, disposal and exposure scenarios. EPA-HQ-OPPT-2016-0743-0015.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176410

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Akin Gump Strauss Hauer & Feld LLP. 2018. Re: EPA docket EPA-HQ-OPPT-2016-0743: N-Methyl-2-pyrrolidone ("NMP"), CAS# 872-50-4 comments regarding the NMP problem formulation document. EPA-HQ-OPPT-2016-0743-0102.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176411

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	dip cleaning of plastic films
Process Description:	NMP is used to remove residual colorants from the surface of plastic films following a coloring process. The plastic film, which is initially colored by moving the material through a solvent" colorant solution, is cleaned of excess colorant by processing the material through a wash basin containing NMP. The NMP wash basins are open to allow film to move to other units for further processing. The NMP in the basin is cooled to minimize evaporation. After the NMP wash basins, the product is further washed with water which is collected and routed to an on-site biological treatment plant.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Low	× 1	3	Anonymous comment - data, data sources, and/or techniques used in the assessment or report are not specified
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type

Continued on next page

Source Citation:	Akin Gump Strauss Hauer & Feld LLP. 2018. Re: EPA docket EPA-HQ-OPPT-2016-0743: N-Methyl-2-pyrrolidone ("NMP"), CAS# 872-50-4 comments regarding the NMP problem formulation document. EPA-HQ-OPPT-2016-0743-0102.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176411

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
Overall Quality Determination[†]		High		1.3	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	American Chemistry Council. 2017. American Chemistry Council comments on the U.S. Environmental Protection Agency's initial 10 chemicals identified for risk evaluation. EPA-HQ-OPPT-2016-0743-0011.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176412

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints, coatings, adhesives
Process Description:	NMP is used as a coalescing aid in antistatic applications. By allowing particles to coalesce into a more continuous film, NMP enhances antistatic performance by a factor of ten or more compared to solutions without NMP. NMP is used to control the viscosity of urethane coatings in the process of making aqueous dispersions.
Chemical Concentration:	0.5 percent ; 5-15 percent ; <5 percent ; <1.5 percent ; <0.5 percent ; <14 percent ; 30-50 percent ; <0.1 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	ACC poll of trade association members. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	Medium	× 1	2	Range with uncertain statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited information on concentration variability
Overall Quality Determination[†]			High		1.3	

Source Citation:	American Chemistry Council. 2017. American Chemistry Council comments on the U.S. Environmental Protection Agency's initial 10 chemicals identified for risk evaluation. EPA-HQ-OPPT-2016-0743-0011.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176412

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	American Chemistry Council. 2017. American Chemistry Council comments on the U.S. Environmental Protection Agency's initial 10 chemicals identified for risk evaluation. EPA-HQ-OPPT-2016-0743-0011.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176412

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Chemical processing, excluding formulation (polymer manufacturing)
Process Description:	NMP is capable of dissolving difficult polymers. This makes it ideal for applications such as dissolving polyester oligomers at an elevated temperature and then precipitating them to form polyester beads.
Chemical Concentration:	High concentrations of NMP may be necessary

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	ACC poll of trade association members. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2017
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination†			High		1.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Alliance of Automobile Manufacturers. 2017. Re: Scope of risk evaluations for ten chemicals designated on December 19, 2016. EPA-HQ-OPPT-2016-0743-0035.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5176413

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	all - list of uses in the auto industry
Process Description:	According to a blinded analysis involving our members, this chemical is used in the auto manufacturing process in painting, stripping, and cleaning. The chemical is used in certain polymers, leather, adhesives, coatings, bonding agents, inks, and paints in certain components.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Trade association poll of manufacturers. No bias /errors evident.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information is from the source
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	This metric is not applicable to this data type
Overall Quality Determination[†]		High		1.1	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	EaglePicher Technologies, LLC. 2020. Comments of EaglePicher Technologies, LLC on the draft TSCA risk evaluation of n-methylpyrrolidone (NMP): EPA"HQ"OPPT-2019-0236.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592029

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Process Description:	See process description starting on the bottom of page 1. In summary, NMP is used in cathode and anode coatings as a carrier solvent. The facility only receives sealed containers of virgin NMP and pre-mixed binder-NMP solution. Coating is applied in enclosed system by a slot die or reverse comma coating head. Once applied, NMP evaporates in a negative pressure drying oven (emissions captured). NMP is not used in cleaning.
Total Annual U.S. Volume (and percent of PV):	One facility: 1,100 kg NMP/yr. Another facility: 800 kg NMP/yr
Number of Sites:	2
Operating Days per Year and Batches per Day:	One facility: 1-2 bt/day, 3-4 days per week. Another facility: 1 bt/day, 3 days per week

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information from manufacturer of lithium ion batteries. No bias /errors evident.
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Low	× 1	3	Characterized by no statistics
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP

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Source Citation:	EaglePicher Technologies, LLC. 2020. Comments of EaglePicher Technologies, LLC on the draft TSCA risk evaluation of n-methylpyrrolidone (NMP): EPA"HQ"OPPT-2019-0236.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592029

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.6	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592033

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Process Description:	In the manufacturing of lithium ion cells, NMP is used only as a carrier for the binder resin used to form the cathode (and to a lesser extent, the anode) component of the cell. NMP is mixed with powder chemicals and binders, and then the solution is coated onto thin metal foils with a precise automated roll coating process /pumped to a coating die-head and deposited onto a foil current collector. The wet coated foil is passed through a drying oven to drive off the liquid. NMP is not a final component in lithium ion cells. (description pg 5-15). The handling of NMP in small containers in cell manufacturing facilities is limited to infrequent use in the laboratory or small-scale operations where they are opened only in ventilated hood areas with personnel equipped with extensive PPE for no more than 30 minutes a shift. NMP is not typically handled in drums. NMP is delivered to most lithium ion cell manufacturing facilities by rail car and/or semi-trailer truck.
Possible Physical Form:	NMP used for lithium ion cell making has substantially lower moisture content

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a trade association of manufacturers. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020

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Source Citation:	LICM. 2020. Comment on docket no. EPA-HQ-OPPT-2019-0236, Toxic Substances Control Act (TSCA) draft risk evaluation for n-methylpyrrolidone (NMP).				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592033				

EVALUATION

Domain	Metric	Rating	MWF[*]	Score	Comments
	Metric 5: Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination[†]		High		1.4	

[*] MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM . 2020. Conference call with Lithium Ion Cell Manufacturers" Coalition (LICM) on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0114.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592025

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Process Description:	Large sites: NMP distillation –> cathode slurry mixing –> cathode slurry coating –> cathode drying –> NMP collection and recycle to distillation process so that it can be reused. Small sites: NMP truck delivery of small containers (1-gal). Small volume of NMP waste is produced and packaged into drums and hauled off-site for hazardous waste disposal.
Chemical Concentration:	99.8 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	NMP concentration data provided as single data point. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty

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Source Citation:	LICM . 2020. Conference call with Lithium Ion Cell Manufacturers" Coalition (LICM) on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0114.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592025

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM . 2020. Conference call with Lithium Ion Cell Manufacturers" Coalition (LICM) on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0114.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592025

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Process Description:	Virgin NMP truck unloading occurs only at large sites. Third party vendor transfers from tanker trucks to large, exterior tanks. Employees may set up safety perimeter, ensure safety during unloading process, and assist the driver at the beginning and end of the process. //Small container unloading occurs at small sites. DOT-compliant boxes of 1-gallon containers of NMP, securely stored. Small containers used to prep mixture components for mixer or any small container use. //Waste loading into drums occurs only at small sites. Drums torqued to seal and moved on drum dolly to storage location until third-party vendor loads truck for disposal. //Slurry mixing occurs in semi-automated process at small sites and fully automated process at large sites. NMP added to slurry as a carrier. Slurry mixture containing NMP mixed for consistency prior to application to metal foil. //Coating and drying occurs as fully automated process at both small and large sites. //Maintenance occurs at both small and large sites and includes parts washing, equipment adjustments and repairs, and other non-routine tasks.
Chemical Concentration:	>99 percent (virgin NMP - unloading from various containers), <=60 percent (waste NMP loading, slurry mixing, cathode coating)

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope

Source Citation:	LICM . 2020. Conference call with Lithium Ion Cell Manufacturers" Coalition (LICM) on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0114.			
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;			
Hero ID	6592025			

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	NMP concentration data provided as single data points. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†			High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592024

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - Lithium Ion Battery
Process Description:	Made in small batches production is not continuous. Cathodes and anodes are made from metal powders that are dissolved in NMP, which serves as a "binder" solution. At the Joplin site, NMP arrives in small premixed metal containers (4 gal) or pure NMP (1 gal); at the Greenwich site, NMP arrives in 55-gal drums, which are connected to a valve –> added to mixer –> blending –> transferred to tank, then coater/dryer –> NMP driven off during coating/drying process
Total Annual U.S. Volume (and percent of PV):	Joplin MO site: 1,100 kg/yr Greenwich, RI: 800 kg/
Number of Sites:	yr 2 that use NMP: Joplin, MO and Greenwich, RI

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2020
	Metric 5: Sample Size	Medium	× 1	2	PV data provided as single data point for each site. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					

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Source Citation:	EaglePicher Technologies, LLC. 2020. Conference call with EaglePicher Technologies on n-methylpyrrolidone. EPA-HQ-OPPT-2016-0743-0113.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592024				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	FUJIFILM Holdings America Corporation. 2020. FUJIFILM comments for docket ID # EPA-HQ-OPPT-2019-0236 for CASRN 872-50-4, n-methylpyrrolidone (NMP).
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592030

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation into solutions for electronics industry
Process Description:	NMP is used as a formulant /additive in industrial products- variety of inks, adhesives, coating and other products. Water base adhesives, water base laminating clears, screen printing inks, and screen reclamation chemicals. NMP is received in rail cars (28,000 gal), tanks (5,000 gal), totes (330 gal), drums (55 gal), and bottles (1 gal). Formulations leave in the same types of containers. //At MO site: A mixture of several chemicals including NMP are added to an open mixing vessel and blended using a high speed disperser. The blending conditions are at ambient temperature and pressure. The finished product is gravity dispensed or with use of a pneumatic pump into 1 gallon, 5 gallon, and 55 gallon containers.
Total Annual U.S. Volume (and percent of PV):	At MO site: Annual usage is approximately 21,000 lbs
Number of Sites:	4 - North Kingstown RI, Carrollton TX, Greenwood SC and North Kansas City MO
Batch Size:	At MO site: Maximum batch size of 300 gallons
Possible Physical Form:	liquid
Chemical Concentration:	In all products: 10 to 100 percent In printing ink at MO site: 10 to 25 percent

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope

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Source Citation:	FUJIFILM Holdings America Corporation. 2020. FUJIFILM comments for docket ID # EPA-HQ-OPPT-2019-0236 for CASRN 872-50-4, n-methylpyrrolidone (NMP).				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592030				

EVALUATION

Domain		Metric	Rating	MWF*	Score	Comments
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	PV and concentration data provided as single data point or range. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†			High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5161295

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - semiconductor manufacturing
Process Description:	Drums used for waste. Waste drum Disconnect, Removal, Handling (55 gal). //Small containers include 1 gal containers, 4L and 10L NOWPAKs, 20L containers, and 5-gal plastic totes. //Maintenance includes parts cleaning, filter change out, preventative maintenance. // Virgin NMP truck off-loading: Pull 6 samples for purity analysis; transfer of virgin NMP from a 10,000 gallon tanker truck to a 10,000 gallon tank in the tank farm. Turn on pump; stay in enclosure upstairs during 2 hour transfer. //Waste truck loading: Transfer of approximately 5,000 gallons of NMP waste from a 10,000 gallon tank to a tanker truck.
Chemical Concentration:	20-75 percent (drum handling); 40-75 percent (small container handling); 1-100 percent (maintenance); 100 percent (virgin NMP truck unloading); 92 percent (waste truck loading)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2018
Metric 5:	Sample Size	Medium	× 1	2	Data provided as single data point or range. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP

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Source Citation:	Semiconductor Industry Association (SIA). 2019. NMP Supplemental Data: Container Handling.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	5161295

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	3986801".
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3986801

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - semiconductor manufacturing
Process Description:	NMP is used in semiconductor manufacturing for three main purposes: 1. Solvent (<5 wt. percent NMP) in certain semiconductor chemical formulations which are deposited on the wafer via spin processes in photolithography including photoresists, bottom anti-reflective coatings (BARC), and in spin-coated polyimides (?60 wt. percent NMP); 2. Solvent pre-wet (>90 wt. percent NMP) of wafers prior to application of spin on coatings in photolithography; 3. Solvent (between 30-60 or >90 wt. percent NMP) in wafer cleaning and stripping formulations in wet area. NMP (? 100 wt. percent) is used in some maintenance activities to clean equipment parts. Small quantities of 100 percent NMP also are used in semiconductor analytical laboratories.
Number of Sites:	51 large semiconductor manufacturing facilities were operated in 2017 (NMP is not used in all fabs); in 21 states
Operating Days per Year and Batches per Day:	24 hrs/day; 365 days/yr; 8-12 hr shifts
Chemical Concentration:	Same data as 516295; Photolithography formulations contain <5 percent NMP; Wet cleans/stripper solutions contain between 30-60 or >90 wt. percent NMP; 100 percent NMP Pre-wet layer; 30-60 percent NMP in the polyimide coating layer

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2019

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Source Citation:	3986801".				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3986801				

EVALUATION

Domain	Metric	Rating	MWF⋆	Score	Comments
	Metric 5: Sample Size	Medium	× 1	2	Data provided as single data point or range. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

⋆ MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592032

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics manufacturing - semiconductor manufacturing
Process Description:	Small container handling involved container change out from chemical delivery systems. Drum handling involves inserting and removing dip tubes from drums. Fab workers include photolithography operators who may change out small containers of photoresist that contain NMP. Maintenance includes tool cleaning, filter change outs, and other activities. Virgin NMP truck unloading requires sampling and line connection/ disconnection. Waste truck loading involves sampling, transfer hose operation, and removal of residual with pressurized air.
Chemical Concentration:	50 (central tendency) 75 percent (high-end) (drum handling); 60 (CT) 75 percent (HE) (small container handling); 0.025 (CT) 0.05 (HE) (fab worker with container change out); 0.5 (CT) 100 percent (HE) (main-tenance); 100 percent (CT and HE)(virgin NMP truck unloading); 92 percent (CT and HE) (waste truck loading)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	In scope
Metric 4:	Temporal Representativeness	High	× 2	2	2020
Metric 5:	Sample Size	Medium	× 1	2	Data provided as single data point or range. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity					

Source Citation:	Semiconductor Industry Association (SIA). 2020. Comments of the Semiconductor Industry Association (SIA) on the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP). EPA-HQ-OPPT-2019-0236-0052.	
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;	
Hero ID	6592032	

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Hach Company. 2020. Hach's comments regarding the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP), EPA docket EPA-HQ-OPPT-2019-0236.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592027

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Laboratory
Process Description:	NMP is an ingredient in the Hach product, Silver 2 Reagent Solution Pillows. This laboratory reagent is sold only in unit-dose packaging containing < 5 mL solution per test. One package is opened and poured into a 50-mL mixing cylinder containing powdered Silver 1 Reagent, and the mixing cylinder swirled to dissolve the powder. Once the powder has dissolved, a 50-mL water sample is poured from a graduated cylinder into the mixing cylinder, which is stoppered and inverted to mix.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination[†]			High		1.4	

Source Citation:	Hach Company. 2020. Hach"s comments regarding the draft Toxic Substances Control Act (TSCA) risk evaluation for n-methylpyrrolidone (NMP), EPA docket EPA-HQ-OPPT-2019-0236.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592027

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	National Electrical Manufacturers Association. 2020. NMP use in magnet wire. EPA-HQ-OPPT-2019-0236-0047.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592028

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - magnet wires
Process Description:	NMP is used as a solvent/diluent in high-performance magnet wire enamels, thinners, and cleaners. In the magnet wire industrial process, a copper or aluminum wire is routed through an applicator of solvent-based enamel coating. The size of applicator may vary throughout the industry, but most contain ” 1 gallon of coating, which contains at most 80-85 percent concentration of NMP. After the wire exits the curing oven on its final pass, the newly-enameled wire is given a lubricant coating to aid in coil winding by the customer. The finished product contains only trace amounts of NMP due to the curing process previously described. In addition to the application and curing process, another facet to magnet wire manufacturing is maintenance cleaning. Enameling equipment is bathed in agitated tanks of NMP.
Chemical Concentration:	80-85 percent

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	Medium	× 1	2	Concentration provided as a range. Uncertain statistics and unclear if representative.
Domain 3: Accessibility/Clarity						

Source Citation:	National Electrical Manufacturers Association. 2020. NMP use in magnet wire. EPA-HQ-OPPT-2019-0236-0047.				
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	6592028				

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	ACA. 2020. American Coatings Association submittal to NMP docket: EPA-HQ-2016-0743.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592043

EXTRACTION

Parameter	Data
Life Cycle Stage:	Processing
Life Cycle Description (Subcategory of Use):	Formulation of paint
Process Description:	Mixing occurred in a closed system with NMP being pumped in, as is common for mixing of paints. Mixed in a closed, "small batch" system, with 6 ports on the lid that remain closed throughout loading, mixing and unloading. These ports consist of four 2" ports, one 3" port, and one 6" port.
Batch Size:	500 gallon batch
Site Daily Throughput:	163 lbs. (19.1 gallons)/batch
Chemical Concentration:	100.00 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	In scope
	Metric 4: Temporal Representativeness	High	× 2	2	2018
	Metric 5: Sample Size	Medium	× 1	2	Concentration and throughput provided as single values for one batch. Uncertain if this is representative of the site's operations or operations at other sites.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty

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Source Citation:	ACA. 2020. American Coatings Association submittal to NMP docket: EPA-HQ-2016-0743.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592043

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination†		High		1.4	

* MWF = Metric Weighting Factor
† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	LICM. 2020. Supplemental NMP information to document PPE protection for submission to docket from Lithium Ion Cell Manufacturers. EPA-HQ-OPPT-2016-0743-0116.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	6592044

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Electronics - lithium ion battery
Process Description:	The NMP serves as a carrier for the binder resin in the slurry. The coated foil passes through dryers where the NMP is recovered. NMP does not remain in or on the lithium ion electrode or the final cell after the drying stage of the electrode manufacturing process.

EVALUATION

Domain	Metric		Rating	MWF*	Score	Comments
Domain 1: Reliability						
	Metric 1:	Methodology	Medium	× 1	2	Information is from a manufacturer. No bias /errors evident
Domain 2: Representative						
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	× 2	2	In scope
	Metric 4:	Temporal Representativeness	High	× 2	2	2020
	Metric 5:	Sample Size	N/A		N/A	This metric is not applicable to this data type
Domain 3: Accessibility/Clarity						
	Metric 6:	Metadata Completeness	High	× 1	1	Information provided is firsthand information from industrial user(s) of NMP
Domain 4: Variability and Uncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Does not address variability or uncertainty
Overall Quality Determination[†]			High		1.4	

* MWF = Metric Weighting Factor
[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
  High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.