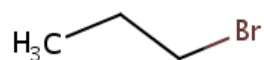


Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal:

1-Bromopropane

CASRN: 106-94-5



February 2017

Support document
for Docket EPA-HQ-OPPT-2016-0741

This document provides a preliminary public summary of available information collected by EPA's Office of Pollution Prevention and Toxics (OPPT) in the Office of Chemical Safety and Pollution Prevention (OCSPP) on the manufacturing (including importing), processing, distribution in commerce, use, and disposal of this chemical. This is based on existing data available to EPA, including information collected under the Chemical Data Reporting rule, information from other Agency databases, other U.S. Government agencies, publicly available information from states, and a review of published literature. In addition, the document includes information reported to EPA by producers and users of the chemical in the United States and in other countries.

This preliminary use information and any additional use information received in the docket by March 15, 2017 will inform efforts to develop the scope of the chemical risk evaluation required under section 6(b)(4) of the Toxic Substances Control Act, and will inform any risk management efforts following risk evaluation.

Mention of trade names in this document does not constitute endorsement by EPA. To verify products or articles containing this chemical currently in commerce, EPA has identified several examples. Any lists are provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

This document does not contain confidential business information (CBI).

TABLE OF CONTENTS

TABLE OF CONTENTS	3
CONTACT	3
MANUFACTURING, PROCESSING, DISTRIBUTION, USE AND DISPOSAL	4
1. MANUFACTURING (INCLUDING IMPORTING)	4
<i>Manufacturing Process</i>	4
2. PROCESSING	5
3. PRODUCTS AND ARTICLES	6
4. DISTRIBUTION (INCLUDES RETAILERS)	14
5. USE	16
<i>Use at Industrial Sites</i>	16
<i>Commercial Uses</i>	17
<i>Consumer Uses</i>	19
<i>Past and Potential Other Uses</i>	19
6. DISPOSAL OF WASTE AND RECYCLING/RECOVERY	20
USEFUL TYPES OF INFORMATION	20
APPENDIX: SOURCES CONSULTED	21

LIST OF TABLES

Table 1. List of Products and Articles.....	7
Table 2. Examples of Products Containing 1-Bromopropane Available for Purchase on the Internet	15

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Docket: EPA-HQ-OPPT-2016-0741

MANUFACTURING, PROCESSING, DISTRIBUTION, USE AND DISPOSAL

1. Manufacturing (Including Importing)

For the 2016 Chemical Data Reporting (CDR) period, data reported indicate that there are two manufacturers and six importers of 1-bromopropane in the United States^{1,2}. Additional companies manufacturing or importing 1-bromopropane are claimed as confidential business information (CBI). The total volume (in lbs.) of 1-bromopropane manufactured (including imported) to the United States in 2012 was 18,770,090; in 2013: 24,039,932; in 2014: 18,503,022; in 2015: 25,887,235.

While 1-bromopropane has recently been listed as a chemical required to be reported to the Toxics Release Inventory (TRI), reports have not yet been submitted and data are not available.

In 2007, there were two domestic producers of 1-bromopropane for solvent use: Albemarle Corporation and Chemtura. This information is from the Analysis of Economic Impacts of Final nPB [1-bromopropane] rulemaking for Cleaning Solvent Sector of the Significant New Alternatives Program under the Clean Air Act.

Source: <https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0297>.

Manufacturing Process

Two references available to EPA describe the manufacturing process for 1-bromopropane:

1. The NTP Report on Carcinogens monograph for 1-bromopropane describes the manufacturing process as the reaction of n-propyl alcohol with hydrogen bromide and then removing the water that forms in the process. Another process to produce 1-bromopropane is by dehydrating propanol with bromine or hydrogen bromide in the presence of sulfur catalyst. The NTP document also mentions that Patent Number 5,773,672 (June 30, 1998), was assigned to a U.S. manufacturer of 1-bromopropane. Some of the information in the NTP document comes from the 2003 monograph that NTP did regarding the reproductive and developmental effects of 1-bromopropane.
Source: <https://www.regulations.gov/document?D=EPA-HQ-TRI-2015-0011-0039>.
2. Description from the *Kirk-Othmer Encyclopedia of Chemical Technology*. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. V4: 257 (1978): "Treatment of the parent hydroxyl compound with a bromide and sulfuric acid, as in the preparation of methyl bromide.

¹ Manufacturers (including importers) are required to report under CDR if they meet certain production volume thresholds, generally 25,000 lb or more of a chemical substance at any single site. Reporting is triggered if the annual reporting threshold is met during any of the calendar years since the last principal reporting year. In general, the reporting threshold remains 25,000 lb per site. However, a reduced reporting threshold (2,500 lb) now applies to chemical substances subject to certain TSCA actions. <https://www.epa.gov/chemical-data-reporting/how-report-under-chemical-data-reporting>

² Manufacture means to manufacture, produce, or import for commercial purposes. Manufacture includes the extraction, for commercial purposes, of a component chemical substance from a previously existing chemical substance or complex combination of chemical substances. (40 CFR 711.3)

https://www.epa.gov/sites/production/files/2015-12/documents/cdr_fact_sheet_importers_final_dec2015_0.pdf

If the parent compound is unstable toward sulfuric acid, hydrobromic acid is passed in and alkyl bromide is flashed over from the hot mixture. The product is condensed, neutralized, and fractionated. In modifications of these procedures, bromine may be used along with a reducing agent such as sulfur, sulfur dioxide, phosphorus, or sodium borohydride.”

Source: <https://pubchem.ncbi.nlm.nih.gov/compound/7840#section=Methods-of-Manufacturing>.

One reference indicates that 2-bromopropane (75-26-3) is present as a contaminant (0.1% to 0.2%) of 1-bromopropane.

Source: <https://pubchem.ncbi.nlm.nih.gov/compound/7840#section=Methods-of-Manufacturing>.

2. Processing

For the 2016 CDR period, data reported indicate that 1-bromopropane is processed³ for the following:

- As a reactant or intermediate in the following sectors:
 - Basic inorganic chemical manufacturing
 - Basic organic chemical manufacturing
 - Pesticide, fertilizer, and other agricultural chemical manufacturing
- Incorporated into formulation, mixture, or reaction product, as a solvent for cleaning or degreasing, in the following sectors:
 - Soap, cleaning compound, and toilet preparation manufacturing
 - All other chemical product and preparation manufacturing
 - Computer and electronic product manufacturing
 - Electrical equipment, appliance, and component manufacturing services
- Incorporated into formulation, mixture, or reaction product, as a solvent which becomes part of product formulation or mixture in the adhesive manufacturing sector
- Incorporated into formulation, mixture, or reaction product, as a non-pesticidal agricultural chemical
- Incorporated into an article, as a solvent which becomes part of product formulation or mixture in the construction sector
- Repackaging as a solvent for cleaning or degreasing, in the chemical product and preparation manufacturing sector.
- Repackaging for uses not known or reasonable ascertainable
- Used as non-incorporative activity (e.g. as a chemical processing or manufacturing aid) as a solvent for cleaning or degreasing, in the fabricated metal product manufacturing sector.

³ The term "process" means the preparation of a chemical substance or mixture, after its manufacture, for distribution in commerce—

(A) in the same form or physical state as, or in a different form or physical state from, that in which it was received by the person so preparing such substance or mixture, or

(B) as part of an article containing the chemical substance or mixture.

<http://uscode.house.gov/view.xhtml?path=/prelim@title15/chapter53&edition=prelim>

In the mid to late-1990s, 1-bromopropane was introduced as:

- a replacement for methylene chloride in vapor and immersion degreasing operations and critical cleaning of electronics and metals.
- as nonflammable, nontoxic, fast-drying and inexpensive solvent for adhesive resins, and has been marketed as replacement for ozone depleting substances.

Source: NTP; NTP technical report on the toxicology and carcinogenesis studies of 1-bromopropane (CAS No. 106-94-5) in F344/N rats and B6C3F1 mice (inhalation studies), National Toxicology Program P.O. Box 12233 Research Triangle Park, NC 27709, August 2011, NTP TR 564, NIH Publication No. 11-5906. Available from as of July 17, 2013 http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/TR564.pdf (From HSDB database).

1-Bromopropane is also mentioned in 3,628 patents.

Source: <https://pubchem.ncbi.nlm.nih.gov/compound/7840#section=Patents>.

3. Products and Articles

Data reported to CDR for the 2016 submission period indicate that 1-bromopropane is present in the following products:

- Adhesives and sealants (commercial and consumer)
- Agricultural products (non pesticidal) (not known or reasonable ascertainable if commercial and consumer)
- Cleaning and Furniture Care Products (commercial)
- Electrical and electronic products (commercial)
- Metal products not covered elsewhere (commercial)
- Other (commercial)

According to the *Analysis of Economic Impacts of Final nPB [1-bromopropane] rulemaking for Cleaning Solvent Sector* of the SNAP program, in 2007 there were seven major 1-bromopropane-based solvent manufacturers and three major 1-bromopropane-based adhesive manufactures. In addition, there were approximately 60 small providers of specialty products that contained 1-bromopropane, and approximately 20 or 25 companies that prepared aerosol formulations with 1-bromopropane.

Source: <https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0297>.

Results of a search of products and articles containing 1-bromopropane are in the table below. EPA has identified the following types of products currently in commerce. This list is provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

Table 1. List of Products and Articles

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Adhesives			
Normac 900R-NPB	Rubber Adhesive	60-85	http://www.blairrubber.com/msds/Normac%20N-PrBr.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
751 G	A non-chlorinated, canisterized contact adhesive	NA	http://choicebrandsadhesives.com/?s=751G Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
STA'-PUT SP4H Contact Adhesive		55 - 75	http://itwstaput.com/wp-content/uploads/bsk-pdf-manager/145_SP4H_STA-PUT_SP4H_CONTACT_ADHESIVE.PDF Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
EverStrong ES38 Contact Adhesive – Aerosol & Canister	Designed for decorative laminates and veneers, fiberglass, glass, upholstery, fabrics, foam, auto headliners, cork and particle board	60 - 70	http://www.newstaradhesivesusa.com/wp-content/themes/bizniz/pdfs/SDS/ES38_SDS.pdf
EverStrong ES138 Contact Adhesive – Air Assist Canister	Designed for air assist spray. For bonding decorative laminates and veneers, fiberglass, glass, upholstery, fabrics, foam, auto headliners, cork and particle board	60 - 80	http://www.newstaradhesivesusa.com/wp-content/themes/bizniz/pdfs/SDS/ES138_SDS_v1.pdf
K-Grip 503 Premium Adhesive and K-Grip 503 Red Premium Adhesive	Adhesive	35 - 60	http://www.k-gripadhesives.com/pdfs/K-GRIP%20503%20MSDS.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
NCF Accelerator	A product to make adhesives dry more quickly	98 - 99	http://www.caglu.com/assets/msds/NCF_Hot_and_Mild.pdf
Degreaser/Cleaner			
VDS-3000-Stabilized N-Propyl Bromide	Cleaner-degreaser, printed circuit boards cleaning, precision cleaning, metal cleaning, carbon removal, automotive parts cleaning, drying agent	> 94	http://albatross-usa.com/pdf/elecchemmsds/AlbatrossVDS3000MSDS.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
ABZOL®VG cleaner	Decreasing, vapor cleaning, cold cleaning metal parts	NA	https://www.albemarle.com/filelib/FileCabine/Products/Performance_Chemicals/ABZOL_TD/S/SOL-0001_ABZOL_Cleaners_TDS_08.2013.pdf https://www.albemarle.com/products---markets/bromine-specialties/specialty-chemicals/cleaning-solvents/abzol%AE-regulatory-2177.html Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
VaporEdge 1000			http://www.cdph.ca.gov/programs/hesis/Documents/bpropane.pdf www.turi.org/content/download/8923/159880/file/Fact_Sheet_n-Propylbromide

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Leksol	Vapor Degreasing, ultrasonic cleaning and cold cleaning of: pressed parts, metal components, marine and automotive parts, aerospace components, oxygen equipment, instruments, optical lenses, medical parts	>94	http://objects.eanixter.com/PD364732.PDF http://www.amityinternational.com/product/leksol/ Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0016 https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Glisten	Glass cleaner	< 1	http://www.atcointernational.com/DSN/wwwatco-intlcom/Content/Documents/SDS%20Sheets/Glisten%20-%203782.pdf
Super Degreaser™	General purpose degreaser (20 ounce aerosol). Air tools, mechanical brakes, clutches, chains, wire ropes, motors, dies, molds, parts, bearings, generators & compressors	40 - 50	http://www.crcindustries.com/faxdocs/msds/3110.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Hypersolve™ or Hypersolve™ NPB	Metal cleaner, degreaser and flux remover (1, 5 and 55 Gallons)	>95 Or >93	http://www.ecolink.com/wp-content/uploads/hypersolve_msds.pdf http://www.ecolink.com/wp-content/uploads/2015/06/Hypersolve-EN-sds.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Triagen	Industrial metal cleaner	95	http://www.ecolink.com/wp-content/uploads/triagen-a_msds Reference http://www.cdph.ca.gov/programs/hesis/Documents/bpropane.pdf
EnvSolv	Patented stabilized n-propyl bromide mixture. Precision vapor degreasing, ultrasonic cleaning, cold wipe cleaning	>90	http://www.cleansolutions.org/downloads/msds/592/EnvSolv%20MSDS.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
EnSolv 5408 (Aerospace) EnSolv/EnSolv-GCS (Vapor Degreasing) EnSolv EX (Asphalt Extraction) EnSolv SC (Aerosol) EnSolv-Ionic (Electronics)			http://www.envirotechint.com/industrial-solvents/npb-solvents/ensolv/ Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Tech Kleen ® AER	AER is available in drums or in bulk, designed for being packaged into aerosol cans for various uses, as carriers for other products like silicones or lubricants, or as a degreaser or electrical contact cleaner/defluxer		http://www.envirotechint.com/industrial-solvents/npb-solvents/tech-kleen/
Tech Kleen ® AZE	Precision vapor degreasing, ultrasonic cleaning, cold wipe cleaning	>93	http://www.envirotechint.com/pdf/TechKleen%20AZE%20SDS.pdf
Tech Kleen ® BOOSTER	A proprietary blend that can be mixed directly into any Tech Kleen formula to replenish stabilizers for prolonged use		http://www.envirotechint.com/industrial-solvents/npb-solvents/tech-kleen/

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Tech Kleen ® RECLAIM	Recycled n-propyl bromide		http://www.envirotechint.com/industrial-solvents/npb-solvents/tech-kleen/
Tech Kleen ® STNPB AG	Used in the aerospace industry to clean a variety of metallic parts, including engine blades and landing gear		http://www.envirotechint.com/industrial-solvents/npb-solvents/tech-kleen/
LPS® Instant Super Degreaser	A nonflammable, heavy-duty solvent designed to remove oil, grease, wax, dirt, moisture, tar and other contaminants	60 - 70	http://www.lpslabs.com/site_files/tech_downloads/10720.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Bromothane™ R		60 - 100	http://www.microcareprecisioncleaners.com/products/product/bromothane-r-defluxer/ Reference http://www.cdph.ca.gov/programs/hesis/Documents/bpropane.pdf
Techtride DG			http://www.partscleaningtech.com/uploads/docs/Techtride_DG_TDS.pdf Reference http://www.cdph.ca.gov/programs/hesis/Documents/bpropane.pdf
Lenium®*ES	For vapor degreasing. Designed to remove flux residues as well as ionic contamination from circuit assemblies and microelectronics. Also removes metalworking fluids and MIM debinding agents. Aerospace (electronics, precision manufacturing)	80 - 90	http://www.cleansolutions.org/downloads/msds/609/Lenium%20ES%20MSDS.pdf http://www.petroferm.com/products/lenium-es Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Lenium®*GS	Designed to remove adhesives, greases, hydraulic fluids, metalworking fluids, oils, sealants, waxes. Extend solvent life with additive. Aerospace (precision manufacturing, aerospace, automotive, defense, medical)	>90	http://www.petroferm.com/products/lenium-gs http://www.cleansolutions.org/downloads/msds/610/Lenium%20GS%20MSDS.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Solvon® PB	Specialized vapor degreaser solvent. For industrial use only	>94	https://www.laddresearch.com/index.php/lano/attachments/download/file/id/113/store/1/20420sds.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
5020 Quick Solv Solvent Degreaser	Replaces chlorinated solvent degreasers. Cleans most metals including aluminum, magnesium, copper, brass, tin plate, and more without dulling, corroding, oxidizing or staining	60 - 100	http://questspecialty.com/sds/5030_SDS_QS.pdf
En Tron	For precision cleaning. For precision vapor degreasing, flush, immersion, and ultrasonic cleaning	NA	http://www.relspec.com/products/entron/entron-overview.htm
En Troan - AE	For asphalt extraction	> 90	http://www.relspec.com/applications/asphalt-extraction-solvent.html http://www.relspec.com/products/entron/EnT ron-AE_SDS.pdf

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
En Tron - Aero	For use as a direct replacement for chlorinated solvents: TCE and PERC. Formulated for metal, plastic and elastomer compatibility in aerospace cleaning and can be used to clean titanium	NA	http://www.relspec.com/products/entron-aero/entron-aero-overview.html
Gen Tech	For metal cleaning, metal fabricating and metal finishing. For vapor degreasing and ultrasonic cleaning in high-volume, high production vapor degreasing applications	NA	http://www.relspec.com/products/gentech/genotech-overview.htm
United C174 Contac Cleaner	Aerosol contact cleaner (2011)	10 – 30	http://www.unitedlabsinc.com/canada/content/pdf/msds/C174msds.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
PENSOLV PB 2000	Solvent degreaser	>95	http://westpenetone.com/wp-content/uploads/Pensolv-PB2000-SDS-EN.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
NU TRI CLEAN AEROSOL	For use in engines, parts, machinery, circuit boards, electrical contacts, aircraft/marine facilities, industrial plants, repair shops, maintenance shops. Degreases many metal surfaces	>90	http://www.zep.com/ZepSearch/default1.aspx?search=Solvent+Based+Cleaner%2fDegreaser&num=20&match=Exact&country=U https://sds.zepinc.com/ehswww/zep/result/direct_link.jsp?P_LANGU=E&P_SYS=2&P_SSN=11337&C001=MSDS&C002=US&C003=E&C013=874201&C123=SDS*
NU TRI CLEAN BULK	Solvent cleaner, degreaser and electrical contact cleaner. For degreasing aircraft surfaces and parts. Can also be used for printed circuit boards or electrical parts cleaning. For use on ground service equipment, hydraulic machines, etc. No rinsing needed	>90	https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0015 http://www.zep.com/ZepSearch/default1.aspx?search=Solvent+Based+Cleaner%2fDegreaser&num=20&match=Exact&country=U https://sds.zepinc.com/ehswww/zep/result/direct_link.jsp?P_LANGU=E&P_SYS=2&P_SSN=11337&C001=MSDS&C002=US&C003=E&C013=J25435&C123=SDS* Reference: https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0015
POWER SOLV 5000	Use on brake parts, diesel and internal combustion engines, marine motors, power tools, refrigeration and air-conditioning. Use in Automotive Repair Shops, marine products, passenger car rental and leasing, equipment rental and leasing, motorcycle dealerships, plant maintenance departments, farm machinery, new and used car dealerships, trunk rental and leasing, and industrial machinery suppliers	90 - 100	https://sds.zepinc.com/ehswww/zep/result/direct_link.jsp?P_LANGU=E&P_SYS=2&P_SSN=11337&C001=MSDS&C002=US&C003=E&C013=002101&C123=SDS* http://www.zep.com/ZepSearch/default1.aspx?search=Degreasers&num=10&match=Exact&country=U Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Degreaser/Cleaner – Electronics			
Precision Rinse NS	Cleaner for electronic components and assemblies	65 - 75	http://www.aclstaticide.com/rinse_ns.html http://static.rshughes.com/wm/p/wm-asis/f9b31c338f275b2db30ab06e36934609559298aa.pdf?uf=

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Solv	Non-flammable dielectric solvent	60 - 100	http://www.americanindustries.com/images/SOLV_2-SDS_2427_02_2015-06-01.pdf
Type TR™ Cleaner/ Degreaser – Aerosol	Electrical cleaner/degreaser	95-100	http://www.polywater.com/MSDS/TRAerosolMSDS.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Cable Cleaner Degreaser	For cable cleaning: semi-conductive cores of high voltage cables when splicing and terminating cables	90 -100	http://docs.crcindustries.com/msds/2064.pdf
Cable Clean RD	Cable cleaner	1 - 3	http://www.crcindustries.com/faxdocs/msds/2150.PDF
CBC II Contact Cleaner	Aerosol	44	http://media.diversitech.com/doc/DOC32381.pdf
Electro-Wash®NR	Cleaner degreaser for printed circuit boards, relays and switches, transformers, mechanical devices, electric motors and generators, electronic controllers and pneumatic/hydraulic systems	65 - 75	http://static.rshughes.com/wm/p/wm-asis/74ef95f16b1ddf5a78a4df13f2543608e7f5e2.pdf?uf= (Not currently made by the manufacturer, but available on the secondary market)
Kontakt Restorer	Clean, lubricate and protect connectors. Applications: circuit breakers, contact breaker points, distribution panels, intersurface connectors, motors and generators, plugs and sockets, potentiometers, relay contacts, solenoids, switching devices	65 – 75	http://www.alliedelec.com/m/d/62598cd22e1fc9eccbb59ba0dcbaf5f5.pdf (Not currently made by the manufacturer, but available on the secondary market)
Pow-R-Wash NR Contact Cleaner		65 – 75	http://media.hiscoinc.com/Volume2/d110001/medias/docus/130/ltw%20Chemtronics-9700_ES1613-SDS_VD.pdf Reference: HSIA petition to add 1-bromopropane to the HAP list.
LPS® NoFlash Nu	Applications: contacts, controls, circuit breakers, instrumentation, meters, relays, sensors, switches Note: available in Canada only (although available on Amazon.com)	60 - 70	http://www.lpslabs.com/site_files/tech_downloads/204015.pdf
525 Contact Cleaner		47-84	http://www.mrosolutions.com/msds/525a.pdf
Enviro Tac	High purity, high dielectric, rapidly evaporating, non-flammable aerosol spray, contact and circuit board cleaner. Formulated for removing oil, grease, condensation, dust and other particulate matter from sensitive electronic parts. Formulated to be use with most plastics, including polypropylene, Neoprene W, nylon, PTFE, PVC, silicone rubber, butyl, and others	60 - 100	http://onlyomega.com/site/wp-content/uploads/enviro-tac_sds.pdf

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Mega Safe	Cleans and degreases electric motors, power tools, printing presses, refrigeration and air conditioning equipment, generators and starters, office machines, most metals including steel, nickel, zinc, titanium, galvanized steel, copper, magnesium, brass and tin plate. Also for use on some plastics, including those used in contact and circuit board construction. May affect certain types of plastics, such as PVC, ABS, acrylic styrenes, and polycarbonates.	60 - 100	http://onlyomega.com/site/wp-content/uploads/mega-safe_sds.pdf
76334 High Tech Electronic Cleaner		40 - 50	http://www.chemcas.com/msds_archive/part2/cas/gf_msds/osborn_com---76334.asp
5020 Quick Solv Solvent Degreaser	Replaces chlorinated solvent degreasers. Solvent for oils, greases, waxes, resins, epoxies, polymers, and more. Cleans most metals including aluminum, magnesium, copper, brass, tin plate, and more without dulling, corroding, oxidizing or staining	60 - 100	http://questspecialty.com/sds/5030_SDS_QS.pdf
PCA II	Electronic cleaning agent. Cleans grease, oil, dirt, moisture and flux from circuit boards, motors, film, relays, ignition switches and other precision equipment	60 - 100	http://questspecialty.questvapco.com/sds/5489_SDS_QS.pdf
Sprayon® EL™ 2846 Non-chlorinated Flash Free Electronic Solvent Aerosol or EL2846 Non-chlorinated Electrical Degreaser – Aerosol	To remove dirt, oil, grease and wax	92.64	http://www.paintdocs.com/docs/webPDF.jsp?SITEID=SO&doctype=SDS&prodno=S20846000&lang=2
Sprayon® EL™ 2846L Non-chlorinated Flash Free Electronic Solvent or EL 2846L Non-chlorinated Electrical Degreaser – Bulk – Non-aerosol Spray (Liqui-Sol™) Refill or EL2846L Non-chlorinated Electrical Degreaser – Non-aerosol Spray (Liqui-Sol™)	Removes dirt, oil, and grease from sensitive equipment and precision instruments without leaving any residue	96.5	http://www.paintdocs.com/docs/webPDF.jsp?SITEID=SO&doctype=SDS&prodno=S020846LQ&lang=2
N-Propyl Bromide Safety Solvent	Alternative to chlorinated and chlorofluorinated solvents.	90 - 100	http://www.spraywayinc.com/sites/all/themes/theme687/msds/sw299.pdf
Cleaners – Textiles			
Everblum Gold Cleaning Fluid	Spot cleaning for apparel and textiles	20-30	http://albatross-usa.com/MSDS/1810.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
S.P.I.F. II	Ink remover for screen printing textiles	60 - 70	http://albatross-usa.com/MSDS/1090.pdf
DrySolv	Patented stabilized n-propyl bromide mixture dry cleaning solvent	>87	http://nebula.wsimg.com/f2cf705b3c635b42bd080983f4b328ea?AccessKeyId=F58D237F0A46DAC5AF87&disposition=0 Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
DrySov Spray Testing & Spotter	Patented stabilized n-propyl bromide mixture	>93	http://nebula.wsimg.com/b5b721780e4046dae73c7753945cd994?AccessKeyId=F58D237F0A46DAC5AF87&disposition=0 Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Pettyjohn's Solutions® Homerun Cleaning Fluid	Spot remover for Oriental rugs, upholstery, and other fine textiles	>96	http://www.pettyjohnsolutions.com/pdf/MSDS%20Homerun%20Cleaning%20Fluid%20-%20July%202012.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Fabrisolv®XL	Solvents, mixture (2007)	>94	http://fabrisolv.com/msds/MSDS_Fabrisolv_XL_V01.pdf Reference https://www.regulations.gov/document?D=EP-A-HQ-TRI-2015-0011-0011
Cleaners – Coins and scissors			
Koinsolv	Coin cleaning solvent 16 oz cans	50-100	http://www.wizardcoinsupply.com/old/files/images/Koinsolv-SDS-061115.pdf
Wolff scissors lubricant	Scissors cleaner and lubricant	~ 89%	https://www.wolffindustries.com/media/pdf/safety_data_sheets/WOLFFINDUSTRIESINC_SCISORSLUBE_SDS.pdf
Insulation			
Thermax	Insulating sheathing Note: products offered at different thicknesses	< 5	http://www.dow.com/en-us/elibrary#q=thermax
Thermax Xarmor	Exterior insulation Note: products offered at different thicknesses	< 5	http://www.dow.com/en-us/elibrary#q=thermax
Lubricant			
Cutting oil – aerosol	Industrial cutting fluid	10 - 20	https://www.slideproducts.com/datasheets/pdfs/Slide-41314-Cutting-Oil-OSHA-GHS-SDS.pdf
Cutting oil – bulk	Industrial cutting fluid	12 - 30	https://www.slideproducts.com/datasheets/pdfs/Slide-413bulk-Cutting-Oil-OSHA-GHS-SDS.pdf
Mold cleaning and release			
Silicone Mold Release		20 - 30	http://docs.crcindustries.com/msds/3300.pdf
Epoxy Parfilm Paintable Mold Release		35 - 65	https://www.flexbar.com/PDF/MSDS-Certs/Epoxy%20Parfilm%20MSDS.pdf
NFC Mold Cleaner		60 - 80	http://www.slideproducts.com/datasheets/pdfs/Slide-47112-NFC-Mold-Cleaner-OSHA-GHS-SDS.pdf
Slide Resin Remover Aerosol	Mold cleaner	25 - 30	http://www.slideproducts.com/datasheets/pdfs/Slide-41914-Resin-Remover-OSHA-GHS-SDS.pdf
Slide Thermoset Mold Release		80 - 95	http://www.slideproducts.com/datasheets/pdfs/Slide-45414-Thermoset-Mold-Release-OSHA-GHS-SDS.pdf

Trade Name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to SDS or other Information and References
Slide Quick Paintable MR	Mold release	25 - 35	http://www.slideproducts.com/datasheets/pdfs/Slide-44712E-Quick-Paintable-Mold-Release-OSHA-GHS-SDS.pdf
Slide Quick Silicone Mold Release		25 - 35	http://www.slideproducts.com/datasheets/pdfs/Slide-44612E-Quick-Silicone-Mold-Release-OSHA-GHS-SDS.pdf
Refrigerant Flush			
Johnsen's Premium AC Flush Non-flammable	AC flush	>90	http://www.johnsens.com/uploads/files/6645-6.pdf
Temperature indicators			
OmegaLaq Green Label Thinner		> 95	http://www.omega.com/msds/msdspdf/MSDS_0122A.pdf
OmegaLaq Green 0575	Temperature indicating lacquer Note: the company has several products at different temperatures, and different concentrations of 1-bromopropane	75 - 80	http://www.omega.com/msds/msdspdf/MSDS_0214G.pdf

4. Distribution (Includes Retailers)

According to the *Analysis of Economic Impacts of Final nPB [1-bromopropane] rulemaking for Cleaning Solvent Sector* of the SNAP program, in 2007 approximately 80 distributors and marketing representatives sold products using 1-bromopropane.

Source: <https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0297>.

Several companies offer 1-bromopropane for sale on the internet:

- One company offers 250ml, 1000ml and 5000ml (\$31.93, \$86.21, \$352.26) 1-bromopropane at 99% purity. According to their website, 1-bromopropane is used as solvent in adhesives; degreasing for plastics and optics; cleaning of metal surfaces, electronic circuit boards and multi-layered Organic Light Emitting Diodes; in the production of asphalt, synthetic fiber and aerosols; and as substitute for perchloroethylene in dry cleaning.
Source: <https://www.alfa.com/en/catalog/A10461/>.
- A second company offers 250ml, 1000ml and 5000ml (\$27.90, \$32.90, \$77.80) for chemical synthesis.
Source: <http://www.sigmaaldrich.com/catalog/search?interface=All&term=%20106-94-5&N=0+16273490&focus=product&lang=en®ion=US>.
- A third company, from China, offers 1-bromopropane. The company specializes in providing intermediates for the pharmaceutical sector.
Source: <http://www.chembopharma.com/>.

One distributor offers the option to blend 1-bromopropane to a specific specification, so that the customer has its own product to satisfy their particular needs or application. It is unclear if the customer then will distribute 1-bromopropane under its own label.

Source: <http://www.relspec.com/technical-library/n-propyl-bromide.htm>.

Some of the products listed in Table 1 are also available for purchase on the internet. Table 2 below provides some examples of the distributors of the products available for purchase on the internet. This list is provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

Table 2. Examples of Products Containing 1-Bromopropane Available for Purchase on the Internet

Product	Description and price	References
ACL Precision Rinse NS	Cleaner for electronic components and assemblies 12oz can (\$19.59, \$31.48)	http://www.eis-inc.com/suppliers/productdetail.asp?prod_nbr=ACL8603 https://www.amazon.com/ACL-Staticide-Precision-Rinse-Aerosol/dp/B00K0C1365 http://www.rshughes.com/p/ACL-Staticide-Propyl-Bromide-Ready-To-Use-Precision-Rinse-NS-12-Oz-Aerosol-Can-8603/acl_8603/
Everblum Gold	16 oz for dry cleaning, spotting (\$14.49) gallon (\$117.85 and \$79.95)	https://www.bglieberman.com/product/everblum-gold-16oz/ https://southstarsupply.com/product/everblum-gold-cleaning-fluid/ http://www.americansewingsupply.net/shop/index.php?main_page=product_info&products_id=154
Koinsolv	Coin cleaning solvent 16 oz can (\$24.30, \$28.95, \$36.20)	http://www.wizardcoinsupply.com/product/koinsolv.html , http://www.jpcorner.com/coin-cleaning-chemicals.html https://www.amazon.com/4715-KoinSolv-coin-contaminant-cleaner/dp/B009K4WZAU
CRC Cable Clean RD	Electronics - cable cleaner 16 oz aerosol (\$16.04, \$14.37) 1 gallon (\$70.91)	https://www.amazon.com/CRC-Voltage-Liquid-Cleaner-Aerosol/dp/B000P1JQ22 http://www.graybar.com/store/en/gb/cable-clean-rd-high-voltage-liquid-splice-cleaner-16-oz-aerosol-can-93176417 http://1sourcedist.com/Product/Details/219942?enabled=true
Hypersolve Triagen Aerosol	5 gallons (for aircraft maintenance) (\$395)	http://www.globalfiltration.com/products-1/ecolink/cleaners
Electro-Wash NR	Cleaner degreaser electric devices and electronics 55 gallon drum (\$4,938.38)	http://www.gotopac.com/chemtronics-es5514.html
Kontakt Restorer	Clean, lubricate and protect connectors. 12 oz aerosol (\$19.50)	http://www.hisco.com/Catalog/Chemicals-Cleaning-Supplies/Chemicals/Contact-Cleaners/ES1629-9700
LPS Instant Super, Degreaser	Heavy duty solvent. Aircraft, facility maintenance 20 oz - aerosol (\$28.68) 5 gal (\$830.11) 15 oz aerosol can (\$16.80)	https://www.zoro.com/lps-instant-super-degreaser-size-20-oz-00720/i/G4574202/ https://www.zoro.com/lps-instant-super-degreaser-5-gal-00705/i/G2960553/ http://www.skygeek.com/lps03520.html?gclid=CjwKEAjwy8bABRD5osX MovTHpmQsJACfZYOF9VekSSuBDWq_vk25Pi3_7-t-BgOyBxCsYyB-gybAaxoClfTw_wcB
LPS NoFlash Nu	For cleaning electric contacts, controls circuit breakers, meters. 15 oz aerosol (\$31.79, \$79.99, \$28.60)	https://www.amazon.com/LPS-NoFlash-Electro-Contact-Cleaner/dp/B000ULJOJM https://www.acklandsgrainger.com/en/product/NO-FLASH-NU-CLEANER-340G-AERO/_/R-LPSC04015 http://www.wttool.com/index/page/product/product_id/6153/name/LPS+NoFlash+Nu+Precision+Contact+Cleaner
K-Grip Adhesive	Adhesive 1 gallon (\$38.30) and 12 oz aerosol (\$7.99)	https://www.fabricsupply.com/cart/product/show/5/Supplies---Tools/12/K-GRIP-Premium-503-pt-01-0003--01-0004 http://www.perfectfit.com/24783/155897/Upholstery-Adhesives/K--Grip-Foam--Fabric-Adhesive.html , http://www.rochfordsupply.com/shop/Adhesives_and_Sprays/Bulk_Adhesives/K-Grip_Adhesive_Spray/index.html
525 Contact Cleaner	Versatile cleaner for electronic equipment and components 13 oz aerosol (\$18.99) 16 oz aerosol (\$20.95)	http://www.mutualscrew.com/product/mro-solution-525-contact-cleaner-13-oz-aerosol-197517.cfm https://www.usabluebook.com/m-1162-mro-solutions.aspx

Product	Description and price	References
Osborn 76334 High Tech Electronic Cleaner	Electronic cleaner aerosol (\$12.09) and (\$16.64) with a minimum order of 24 units	https://www.amazon.com/Osborn-76334-Electronic-Cleaner-Aerosol/dp/B00IKIFV6W#feature-bullets-btf https://www.aaabrasives.com/products/26305/622424763349/osborn-high-tech-electronic-aerosol-cleaner76334stock-item

5. Use

Industrial and commercial uses of 1-bromopropane include:

- Intermediate in the manufacturing of organic, inorganic and agricultural chemicals
- Spray adhesives (foam cushions, furniture industry)
- Dry cleaning solvent (machine cleaning, spot cleaning)
- Degreaser (vapor, cold cleaning, aerosol)
 - Computer, electronic and electrical product and equipment manufacturing
 - Fabricated metal product manufacturing
 - Aerospace maintenance cleaning
 - Mold cleaning and releasing
- Other uses (e.g. lubricant, refrigerant flush, cutting oils, insulation)

Consumer uses of 1-bromopropane include:

- Aerosol spray adhesives
- Aerosol spot remover
- Aerosol cleaner and degreaser (engine degreasing, brake cleaning, electronics cleaning)
- Other cleaners (e.g. coin cleaning, scissors cleaning)
- Other uses (e.g. lubricant, refrigerant, cutting oils, insulation, paintable mold release, adhesive accelerant)

More information on these uses is presented below.

Use at Industrial Sites

Data submitted to CDR for the 2016 reporting period include the following uses of 1-bromopropane at industrial sites:

- As a reactant or intermediate
- Incorporated into formulation, mixture, or reaction product
- Incorporated into an article
- Repackaging
- Used as non-incorporative activity (e.g. as a chemical processing or manufacturing aid)

Data submitted to CDR for the 2016 reporting period include the following sectors using 1-bromopropane:

- Adhesive manufacturing sector
- Agriculture, forestry, fishing and hunting

- All other chemical product and preparation manufacturing
- Basic inorganic chemical manufacturing
- Basic organic chemical manufacturing
- Chemical product and preparation manufacturing sector
- Computer and electronic product manufacturing
- Electrical equipment, appliance, and component manufacturing services
- Fabricated metal product manufacturing sector.
- Pesticide, fertilizer, and other agricultural chemical manufacturing
- Soap, cleaning compound, and toilet preparation manufacturing

According to the final rule that added 1-bromopropane to the Toxics Release Inventory (TRI), EPA expects 140 facilities to report under 23 different industrial sectors.

Source: 40 CFR Part 372. Federal Register/Vol. 80, No. 225/Monday, November 23, 2015. Pages: 72906 – 72913. <https://www.epa.gov/toxics-release-inventory-tri-program/addition-1-bromopropane>.

Some reports indicate past uses of 1-bromopropane as an intermediate in the production of other chemicals.

Source: HSBD database.

Other industrial uses for 1-bromopropane include use as a solvent for fat, waxes and resins.

Source: O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Cambridge, UK: Royal Society of Chemistry, 2013., p. 1453 (From HSDB database).

Commercial Uses

Data submitted to CDR for the 2016 reporting period include the following commercial uses:

- Adhesives and sealants (commercial and consumer)
- Agricultural products (non pesticidal) (not known or reasonable ascertainable if commercial and consumer)
- Cleaning and Furniture Care Products (commercial)
- Electrical and electronic products (commercial)
- Metal products not covered elsewhere (commercial)
- Other (specify) (commercial)

EPA's Draft Work Plan Chemical Risk Assessment completed in February 2016 assessed the occupational uses of 1-bromopropane in:

- Spray adhesives
- Dry cleaning – dry cleaning facility has converted their tetrachloroethylene (or perchloroethylene or PERC) dry cleaning machine system to 1-bromopropane and also uses 1-bromopropane in spot cleaning
- Spot cleaning at dry cleaners – dry cleaning facility uses 1-bromopropane based spot cleaner formulations but has not converted their dry cleaning machine system to 1-bromopropane
- Vapor degreasing

- Cold cleaning degreasing
- Aerosol degreasing

The commercial uses described by formulators for products containing 1-bromopropane (Table 1) include:

- Adhesives
- Degreasers/cleaners
- Degreasers/cleaners for electronic equipment
- Degreasing/cleaning of textiles – including dry cleaning
- Degreasing/cleaning of coins and scissors
- Insulation
- Lubricant
- Mold cleaning and releasing
- Refrigerant flush
- Temperature indicators

According to the *Analysis of Economic Impacts of Final nPB* rulemaking for the SNAP program, in 2007 1-bromopropane was used in:

- Non-aerosol solvents
- Aerosols
- Adhesives, coatings, and inks.

Within the sectors using 1-bromopropane in non-aerosol solvents, aerosols, and adhesives, coatings, and inks, the following end uses were identified:

- Metal cleaning (commonly done to remove grease, oil, and metal filings from a number of applications where metal parts were coated, cut, plated, or stamped)
- Precision cleaning (removal of dirt, grease, oil, solder flux, and other impurities where the degree of cleanliness was essential to the end value of the product)
- Electronics cleaning (involved removing excess solder flux from printed circuit boards and other electronic equipment)
- Aerospace maintenance cleaning
- Lubricants and cleaning sprays for spinnerets used in the production of synthetic fibers
- A coating application as an ammunition sealant and coating (one use)
- Adhesives in laminate countertops and flexible foams manufacturing
- Adhesives in prefabricated homes and for cushions in pet beds
- Adhesive for carpeting in boats

Sources:

<https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0297>.

<https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0298>.

1-Bromopropane is a component of products used in:

- Vapor and immersion degreasing operations for cleaning metals, plastics and electronics and optical components
- Adhesive spray applications

- Dry cleaning
- Solvent sprays used in asphalt production, aircraft maintenance and synthetic fiber manufacturing.

Source: OSHA/NIOSH; *Hazard Alert for 1-Bromopropane*. DHHS (NIOSH) Publication Number 2013-150. Available from, as of August 12, 2013

https://www.osha.gov/dts/hazardalerts/1bromopropane_hazard_alert.html (From HSDB database).

Consumer Uses

Data submitted to CDR for the 2016 reporting period include the following consumer uses:

- Adhesives and sealants (commercial and consumer)
- Agricultural products (non pesticidal) (not known or reasonable ascertainable if commercial and consumer)

As described in the commercial use section above, EPA's Draft Work Plan Chemical Risk Assessment completed in February 2016 assessed the occupational uses of 1-bromopropane in aerosol spray adhesives (including spray adhesives and spray accelerant); aerosol spot removers; and aerosol cleaners and degreasers (including engine degreasing, brake cleaning, and electronics cleaning scenarios). While the products that contain 1-bromopropane seem to be intended for industrial or commercial use, many may be available for consumers (see Table 1 and Table 2). These include:

- Aerosol spray adhesives
- Aerosol spot removers
- Aerosol cleaners and degreasers
- Coin and scissors cleaning
- Adhesive accelerant
- Refrigerants
- Cutting oils
- Paintable mold release

Past and Potential Other Uses

Several references from the 1990s were found regarding the use of 1-bromopropane in different applications:

- As an intermediate or feedstock in the production of penconazole, valporic acid.
Source: Ioffe D, Frim R; Bromine, Organic Compounds. Kirk-Othmer Encyclopedia of Chemical Technology. (1999-2013). New York, NY: John Wiley & Sons. Online Posting Date: July 15, 2011 (From HSDB database).
- As intermediate in the production of pesticides, quaternary ammonium compounds, flavors and fragrances, pharmaceuticals, and other chemicals.
Source: NTP; NTP technical report on the toxicology and carcinogenesis studies of 1-bromopropane (CAS No. 106-94-5) in F344/N rats and B6C3F1 mice (inhalation studies), National Toxicology Program P.O. Box 12233 Research Triangle Park, NC 27709, August 2011,

NTP TR 564, NIH Publication No. 11-5906. Available from as of July 17, 2013
http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/TR564.pdf (From HSDB database).

- As an intermediate in the production of Albendazole.
Source: Harder A; Anthelmintics. Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (1999-2013). New York, NY: John Wiley & Sons. Online Posting Date: July 15, 2009 (From HSDB database).

According to the *Analysis of Economic Impacts of Final nPB* rulemaking for the SNAP program, in 2007 the following uses of 1-bromopropane received partial submissions or were withdrawn:

- Incomplete submissions for use as a foam blowing agent and as a part of a fire suppressant blend
- One adhesive manufacturer withdrew its product for use to glue wood or tile on concrete floors

Sources:

<https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0297>.

<https://www.regulations.gov/document?D=EPA-HQ-OAR-2002-0064-0298>.

6. Disposal of Waste and Recycling/Recovery

1-Bromopropane is not regulated as hazardous waste. One product in the market indicates that it contains recycled 1-bromopropane (Tech Kleen® RECLAIM).

USEFUL TYPES OF INFORMATION

This document presents a summary of information currently available to EPA on this chemical. To more fully characterize the manufacturing, processing, distribution, disposal, and use of this chemical, and to inform the development of the scoping document for this chemical, EPA is interested in obtaining information on:

- the functional uses for this chemical;
- what types of products contain this chemical;
- which industry sectors use this chemical;
- what volume of the chemical is used;
- which uses have been discontinued or phased out;
- exposure scenarios for this chemical; and
- in which articles this chemical is found.

APPENDIX: SOURCES CONSULTED

- U.S. EPA *Chemical Inventory*
<https://www.epa.gov/tsca-inventory>
- U.S. EPA *ChemView*
<https://java.epa.gov/chemview>
- TRI P2 information
<https://www.epa.gov/toxics-release-inventory-tri-program/pollution-prevention-p2-and-tri>
- U.S. EPA *HPV HC* (access through Chemical Data Access Tool – CDAT)
https://java.epa.gov/oppt_chemical_search/
- U.S. EPA *HPVIS* and *HPV HC* (access through Chemical Data Access Tool – CDAT)
https://java.epa.gov/oppt_chemical_search/
- DfE Alternatives Assessments
<https://www.epa.gov/saferchoice/design-environment-alternatives-assessments>
- Safer Chemical Ingredients List
<https://www.epa.gov/saferchoice/safer-ingredients>
- Green Chemistry awards
<https://www.epa.gov/greenchemistry/presidential-green-chemistry-challenge-winners>
- Greener products and services
<https://www.epa.gov/greenerproducts/identify-greener-products-and-services>
- Pollution Prevention
<https://www.epa.gov/p2/pollution-prevention-case-studies>
<https://www.epa.gov/p2/grant-programs-pollution-prevention#sra>
<https://www.epa.gov/p2/pollution-prevention-tools-and-calculators>
- U.S. EPA *InertFinder*
<https://iaspub.epa.gov/apex/pesticides/f?p=101:1:>
- U.S. EPA *Pesticide Chemical Search*
<https://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1:0::NO:1::>
- U.S. EPA *Endocrine Disruptor Screening Program*
<https://www.epa.gov/ingredients-used-pesticide-products/endocrine-disruptor-screening-program-tier-1-assessments>
- U.S. EPA *Hazardous Waste*
<https://www.epa.gov/hw/learn-basics-hazardous-waste#regulations>
- U.S. EPA *Superfund chemical data matrix*
<https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm-query>
- U.S. EPA *Hazardous Air Pollutants*
<https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications>
- U.S. EPA *Significant New Alternatives Policy (SNAP)*
<https://www.epa.gov/snap>
- U.S. EPA *Volatile Organic Compounds*
<https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds#definition>
- U.S. EPA *Toxic and priority pollutants under the Clean Water Act*
<https://www.epa.gov/eg/toxic-and-priority-pollutants-under-clean-water-act#toxic>

- U.S. EPA *Contaminant Candidate list under the Safe Drinking Water Act*
<https://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3#chemical-list>
- U.S. EPA *IRIS Assessment*
<https://cfpub.epa.gov/ncea/iris2/atoz.cfm>
- U.S. EPA *SRS*
https://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do
- U.S. EPA *Chemical and Product Categories (CPCat) Database*
<https://actor.epa.gov/cpcat/faces/home.xhtml>
- U.S. National Library of Medicine *ChemIDplus*
<https://chem.sis.nlm.nih.gov/chemidplus/>
- U.S. National Library of Medicine *Hazardous Substance Data Bank (HSBD)*
<https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- U.S. Department of Health & Human Services *Household Products Database*
<https://hpd.nlm.nih.gov/index.htm>
- OSHA *Chemical Hazards and Toxic Substances*
<https://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html>
- NIOSH Workplace Safety and Health Topics *Chemicals*
<http://www.cdc.gov/niosh/topics/chemical.html>
- NIOSH *Pocket Guide to Chemical Hazards*
<http://www.cdc.gov/niosh/npg/npgdcas.html>
- CPSC *Chemicals*
<http://www.cpsc.gov/en/Research--Statistics/Chemicals/>
- CPSC *FHSA*
<https://www.cpsc.gov/Business--Manufacturing/Business-Education/Business-Guidance/FHSA-Requirements/>
- Food and Drug Administration *List of Databases*
<http://www.fda.gov/ForIndustry/FDABasicsforIndustry/ucm234631.htm>
- NTP (National Toxicology Program) *Substances studied by NTP*
<http://ntpsearch.niehs.nih.gov/?e=True&ContentType=Testing+Status>
- Department of Energy *Protective Action Criteria Database*
<http://energy.gov/ehss/protective-action-criteria-pac-aegls-erpgs-teels-rev-29-chemicals-concern-may-2016>
- California Department of Toxic Substances Control *Toxics in Products*
<http://www.dtsc.ca.gov/PollutionPrevention/ToxicsInProducts/index.cfm>
<http://www.dtsc.ca.gov/SCP/CandidateChemicalsList.cfm>
<http://www.dtsc.ca.gov/SCP/WhatIsAPriorityProduct.cfm>
- California Office of Environmental Health Hazard Assessment *Proposition 65*
<http://oehha.ca.gov/proposition-65/chemicals>
<http://oehha.ca.gov/proposition-65/proposition-65-list>
- California Office of Environmental Health Hazard Assessment *Biomonitoring*
<http://biomonitoring.ca.gov/chemicals>
- California *permissible exposure limits for chemical contaminants*
https://www.dir.ca.gov/title8/5155table_ac1.html

- California *hazardous substance list*
<https://www.dir.ca.gov/title8/339.html>
- California *Safe Cosmetics Program – list of chemical agents known or suspected to cause cancer or developmental or other reproductive harm.*
<http://www.cdph.ca.gov/programs/cosmetics/Pages/default.aspx>
<https://safecosmetics.cdph.ca.gov/search/Default.aspx>
- Maine *chemicals of high concern*
<http://www.maine.gov/dep/safechem/highconcern/>
- Massachusetts *Toxics Use Reduction Act (TURA) (link includes a link to Higher hazard substances list)*
<http://www.mass.gov/eea/waste-mgmt-recycling/toxics/toxic-use-reduction/toxics-use-reduction-act/>
- Massachusetts *Complete list of TURA chemicals*
<http://www.mass.gov/eea/agencies/massdep/toxics/tur/toxics-use-reduction-act-tura-reporting-and-fees.html>
- Lowell Center for Sustainable Production *Chemical, Policy and Science Initiative*
<http://www.chemicalspolicy.org/chemicalspolicy.us.state.database.php>
- Minnesota Department of Health *Toxic Free Kids Act Chemicals of High Concern*
<http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/highconcern.html>
- Michigan *Environmental Health Topics*
http://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_74881-13050--,00.html
- New Hampshire *Regulated Toxic Air Pollutants*
<http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a1400.pdf>
- New Jersey *Right to Know Hazardous Substances*
<http://web.doh.state.nj.us/rtkhsfs/rtkhsf.aspx>
- Oregon *Priority Persistent Pollutants (in water)*
<http://www.deq.state.or.us/wq/SB737/>
- Oregon *Pollutant Profiles*
<http://www.deq.state.or.us/wq/SB737/docs/LegRpAtt420100601.pdf>
- Oregon *Reducing Toxics in Oregon*
<http://www.oregon.gov/deq/Pages/ToxicsReduction.aspx>
- Oregon *Chemicals of Concern for Children’s Health*
<http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/ToxicSubstances/Pages/childrens-chemicals-of-concern.aspx>
- Pennsylvania Department of Labor and Industry *Hazardous Substance List*
<http://www.pacode.com/secure/data/034/chapter323/chap323toc.html>
- Rhode Island *Air Resources – Air Toxics*
http://www.dem.ri.gov/pubs/regs/regs/air/air22_08.pdf
- Vermont *Chemical Disclosure Program for Children’s Products*
<http://www.healthvermont.gov/enviro/chemical/cdp.aspx>
- Washington *Chemicals of High Concern to Children*
<http://www.ecy.wa.gov/programs/hwtr/rtt/cspa/chcc.html>
- Washington *Children’s Safe Products Act*
<http://apps.leg.wa.gov/RCW/default.aspx?cite=70.240>

- Washington Department of Labor & Industries *SHARP Publications*
<http://www.lni.wa.gov/Safety/Research/Pubs/default.asp>
- National Conference of State Legislatures
<http://www.ncsl.org/research/environment-and-natural-resources/state-chemical-statutes.aspx>
- Canada *Chemicals Portal*
<http://chemicalsubstanceschimiques.gc.ca/index-eng.php>
- EU *ECHA website*
<https://echa.europa.eu/>
- Australia *NICNAS Chemical Information*
<https://www.nicnas.gov.au/chemical-information>
- Japan *Chemical Risk Information Platform (CHIRP)*
http://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop
- OECD *eChemPortal*
http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- Stockholm Convention on Persistent Organic Pollutants
<http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx>
<http://chm.pops.int/TheConvention/ThePOPs/ChemicalsProposedforListing/tabid/2510/Default.aspx>
- WHO IPCS (UN)
<http://www.who.int/ipcs/en/>
- Other – worker protection information
<http://www.dguv.de/ifa/gestis/gestis-internationale-grenzwerte-fuer-chemische-substanzen-limit-values-for-chemical-agents/index-2.jsp>
- DeLima Associates *Consumer Product Information Database (CPID)*
<https://www.whatsinproducts.com/chemicals/index/1>
- SRC *FatePointers Search Module PHYSPROP*
<http://esc.syrres.com/fatepointer/search.asp>
- Product and company websites