



DuPont Chemicals & Fluoroproducts
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February 4, 2014

Mr. David Sanders
Office of Air Quality Planning and Standards
Mail Drop C359-02
U. S. Environmental Protection Agency
109 TW Alexander Drive
Research Triangle Park, NC 27711

Dear Mr. Sanders:

E. I. DuPont de Nemours (DuPont or Company) requests the U.S. Environmental Protection Agency (EPA or Agency) to exempt the chemical 1,1,1,4,4,4-hexafluorobut-2-ene (HFO-1336mzz-Z) [CAS RN 692-49-9], from the Agency's definition of the term, volatile organic compound (VOC). This exemption would allow HFO-1336mzz-Z to be used in the U.S. without regulation as a potential precursor to tropospheric ozone under the requirements in 40 CFR 51.100(s). HFO-1336mzz-Z has very low potential to generate ozone in the troposphere. Its maximum incremental reactivity (MIR) value is estimated at 0.04 which is 86% lower than the MIR of ethane.

Attached is a summary of data from the peer-reviewed scientific literature on the atmospheric reactivity of HFO-1336mzz-Z and the propensity of this molecule to contribute to tropospheric ozone formation.

HFO-1336mzz-Z Background

HFO-1336mzz-Z was developed to replace foam expansion or blowing agents with higher GWP (>700 GWP) for use in polyurethane rigid insulating foams. Thermal test data and energy efficiency trials indicate that HFO-1336mzz-Z will provide superior insulating value reducing climate change potential through both direct reduction of global warming potential (GWP) and indirect reduction through reduced energy consumption throughout the lifecycle of insulated foams in appliances, buildings, refrigerated storage and transportation. HFO-1336mzz-Z has zero direct ozone depletion potential (ODP) and a GWP of 8.9 on a 100 year time horizon (Baasandorj et al).

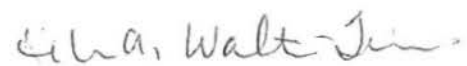
A toxicological assessment indicating low acute toxicity of HFO-1336mzz-Z is attached. DuPont has established an internal occupational exposure limit (AEL - Acceptable Exposure Limit) of 500 ppm (8- and 12- hour TWA) for this substance which is similar to currently commercial foam expansion agents with Occupational Exposure Limits ranging from 100 ppm to 1000 ppm (Formacel® 1100 (FEA-1100): A Zero ODP and Low GWP Foam Expansion Agent Gary Loh et al 2012).

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In addition to this request, DuPont has filed an application for Premanufacture Notice (PMN) and a SNAP Information Notice has been submitted under the Significant New Alternatives Policy program for Agency review (see Section 612 of the CAA).

Please contact me if you have any questions about this request or need further clarification.

Sincerely,



Helen Walter-Terrinoni
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Via Federal Express with attachments

cc: EPA New Chemicals Office and EPA Office of Air and Radiation Stratospheric Protection Division

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About DuPont™ Formacel® 1100

Our Next-Generation Foam Expansion Agent

Formacel® 1100 is a nonflammable liquid at ambient temperature, with a boiling point better suited to polyurethane foam chemistry, processes and equipment. Unlike lower boiling HFC options, Formacel® 1100 can be handled like HCFC-141b, eliminating some of the challenges presented by lower boiling points. Compatibility testing with plastics, elastomers and metals indicate that Formacel® 1100 can be used in current foam manufacturing equipment with little or no modification.

Functional Performance

Formacel® 1100 is a sustainable and balanced option, offering the following characteristics:

- Zero ODP
- Low GWP
- Non-Flammable Alternative
- Low Conversion Cost
- High Energy Efficiency
- Low vapor thermal conductivity
- Liquid at room temperature with a boiling point 33°C (near HCFC-141b)
- Low diffusion rate
- Chemically and thermally stable



Formacel® 1100 (HFO-1336mzz)

- No chlorine
- ODP = 0
- GWP_{100 yr 11th} = 9.4
- Atmospheric lifetime = 24 days
- Non-Flammable (ASTM E681)
- b.p = 33°C (close to HCFC-141b)
- λ_{gas} = 10.7 mW/mK @ 25°C
- Molecular Weight = 164
- Environmental Fate: salts, CO₂, H₂O
- Low Conversion Cost



Why You Should Use
Formacel® 1100 in Your
Insulation

Next-Generation Foam Expansion Agent

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