



Material Safety Data Sheet

The Dow Chemical Company

Product Name: FROTH-PAK(TM) AF 17GAL REF HFC Spray
Foam Sealant

Issue Date: 05/06/2011

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The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

FROTH-PAK™ AF 17GAL REF HFC Spray Foam Sealant

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number:

800-258-2436

SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

989-636-4400

Local Emergency Contact:

989-636-4400

2. Hazards Identification

Emergency Overview

Color: Brown

Physical State: Liquefied gas

Odor: Musty

Hazards of product:

WARNING! May cause eye irritation. May cause skin irritation. May cause allergic skin reaction. May cause allergic respiratory reaction. Vapor reduces oxygen available for breathing. May cause central nervous system effects. Keep upwind of spill. May cause anesthetic effects. May cause respiratory tract irritation. May cause lung injury. May react with water. Stay out of low areas. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction. Toxic fumes may be released in fire situations. Contents under pressure.

OSHA Hazard Communication Standard

®(TM)*Trademark

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause moderate eye irritation. May cause slight temporary corneal injury.

Skin Contact: Prolonged contact may cause skin irritation with local redness. May stain skin.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Skin Sensitization: Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

Inhalation: In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause pulmonary edema (fluid in the lungs.) Effects may be delayed. Decreased lung function has been associated with overexposure to isocyanates. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). May cause central nervous system effects. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

Respiratory Sensitization: May cause allergic respiratory response. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Observations in animals include: Gastrointestinal irritation.

Aspiration hazard: Based on available information, aspiration hazard could not be determined.

Effects of Repeated Exposure: Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

Cancer Information: Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m³) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Birth Defects/Developmental Effects: In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother. Based on information for component(s): 1,1,1,2-Tetrafluoroethane. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9	>= 60.0 - <= 100.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	30.0 - 60.0 %
1,1,1,2-Tetrafluoroethane	811-97-2	>= 5.0 - <= 10.0 %

Note: CAS 101-68-8 is an MDI isomer that is part of CAS 9016-87-9.

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin Contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more

effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Eye Contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Eye wash fountain should be located in immediate work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen fluoride. Hydrogen cyanide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Container may rupture from gas generation in a fire situation. Vaporizes quickly at room temperature. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. If available, use foam to smother or suppress. Refer to Section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Dirt. Vermiculite. Sand. Clay. Do NOT use absorbent materials such as: Cement powder (Note: may generate heat). Collect in suitable and properly labeled open containers. Do not place in sealed containers. Suitable containers include: Metal drums. Plastic drums. Polylined fiber pacs. Wash the spill site with large quantities of water. Attempt to neutralize by adding suitable decontaminant solution: Formulation 1: sodium carbonate 5 - 10%; liquid detergent 0.2 - 2%; water to make up to 100%, OR Formulation 2: concentrated ammonia solution 3 - 8%; liquid detergent 0.2 - 2%; water to make up to 100%. If ammonia is used, use good ventilation to prevent vapor exposure. Contact Dow for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Use with adequate ventilation. Wash thoroughly after handling. Keep container tightly closed. Contents under pressure. Do not puncture or incinerate container. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Store under cover in a dry, clean, cool, well ventilated place away from sunlight. Do not store product contaminated with water to prevent potential hazardous reaction.

Storage Period:
6 Months

Storage temperature:
15 - 27 °C

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
4,4'-Methylenediphenyl diisocyanate	ACGIH	TWA	0.005 ppm
	OSHA Table Z-1	Ceiling	0.2 mg/m3 0.02 ppm
Diphenylmethane Diisocyanate, isomers and homologues	ACGIH	TWA	0.005 ppm
	OSHA Table Z-1	Ceiling	0.2 mg/m3 0.02 ppm
1,1,1,2-Tetrafluoroethane	AIHA WEEL	TWA	4,240 mg/m3 1,000 ppm

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Chlorinated polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air-purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure. Lethal concentrations may exist in areas with poor ventilation.

9. Physical and Chemical Properties

Appearance

Physical State	Liquefied gas
Color	Brown
Odor	Musty
Odor Threshold	No test data available
pH	<i>Not applicable</i>
Melting Point	No test data available
Freezing Point	No test data available
Boiling Point (760 mmHg)	<i>No test data available .</i>
Flash Point - Closed Cup	Not applicable, Gas
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Vapor Pressure	225 psi @ 54 °C Container is under pressure.
Vapor Density (air = 1)	No test data available
Specific Gravity (H ₂ O = 1)	1.24 25 °C/25 °C <i>Estimated.</i>
Solubility in water (by weight)	insoluble, reacts, evolution of CO ₂
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.

Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Kinematic Viscosity	No test data available
Molecular Weight	No test data available

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions

Can occur.

Conditions to Avoid: Elevated temperatures can cause container to vent and/or rupture. Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

Incompatible Materials: Avoid contact with: Acids. Alcohols. Amines. Ammonia. Bases. Metal compounds. Strong oxidizers. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat. Avoid unintended contact with polyols. The reaction of polyols and isocyanates generate heat.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic gases are released during decomposition.

11. Toxicological Information

Acute Toxicity

Ingestion

Single dose oral LD50 has not been determined. Estimated. LD50, Rat > 10,000 mg/kg

Dermal

The dermal LD50 has not been determined. Estimated. LD50, Rabbit > 2,000 mg/kg

Inhalation

The LC50 has not been determined. Estimated. LC50, Aerosol, Rat > 490 mg/m³

Eye damage/eye irritation

May cause moderate eye irritation. May cause slight temporary corneal injury.

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness. May stain skin.

Sensitization

Skin

Skin contact may cause an allergic skin reaction. Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.

Respiratory

May cause allergic respiratory response. MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest. Occasionally, breathing difficulties may be life threatening.

Repeated Dose Toxicity

Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.

Chronic Toxicity and Carcinogenicity

Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m³) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Developmental Toxicity

In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother. Based on information for component(s): 1,1,1,2-Tetrafluoroethane. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

No relevant information found.

Genetic Toxicology

Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative.

12. Ecological Information

Toxicity

Data for Component: Diphenylmethane Diisocyanate, isomers and homologues

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

Based on information for a similar material: LC50, Danio rerio (zebra fish), static, 96 h: > 1,000 mg/l

Aquatic Invertebrate Acute Toxicity

Based on information for a similar material: EC50, water flea Daphnia magna, static, 24 h: > 1,000 mg/l

Aquatic Plant Toxicity

Based on information for a similar material: NOEC, Scenedesmus subspicatus (new name: Desmodesmus subspicatus), static, Growth rate inhibition, 72 h: 1,640 mg/l

Toxicity to Micro-organisms

Based on information for a similar material: EC50; activated sludge, static, 3 h: > 100 mg/l

Toxicity to Soil Dwelling Organisms

EC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: 4,4' -Methylenediphenyl diisocyanate

The measured ecotoxicity is that of the hydrolyzed product, generally under conditions maximizing production of soluble species. Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

Based on information for a similar material: LC50, Danio rerio (zebra fish), static, 96 h: > 1,000 mg/l

Aquatic Invertebrate Acute Toxicity

Based on information for a similar material: EC50, water flea Daphnia magna, static, 24 h: > 1,000 mg/l

Aquatic Plant Toxicity

Based on information for a similar material: NOEC, Scenedesmus subspicatus (new name: Desmodesmus subspicatus), static, Growth rate inhibition, 72 h: 1,640 mg/l

Toxicity to Micro-organisms

Based on information for a similar material: EC50; activated sludge, static, 3 h: > 100 mg/l

Toxicity to Soil Dwelling Organisms

EC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: 1,1,1,2-Tetrafluoroethane

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss), static, 96 h: 450 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, 48 h, immobilization: 980 mg/l

Persistence and Degradability

Data for Component: Diphenylmethane Diisocyanate, isomers and homologues

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

OECD Biodegradation Tests: Based on information for a similar material:

Biodegradation	Exposure Time	Method	10 Day Window
0 %	28 d	OECD 302C Test	Not applicable

Data for Component: 4,4'-Methylenediphenyl diisocyanate

In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

OECD Biodegradation Tests: Based on information for a similar material:

Biodegradation	Exposure Time	Method	10 Day Window
0 %	28 d	OECD 302C Test	Not applicable

Data for Component: 1,1,1,2-Tetrafluoroethane

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
4 %	28 d	OECD 301D Test	fail

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.20E-15 cm ³ /s	1,700 d	Estimated.

Theoretical Oxygen Demand: 0.47 mg/mg

Bioaccumulative potential

Data for Component: Diphenylmethane Diisocyanate, isomers and homologues

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: 4,4'-Methylenediphenyl diisocyanate

Bioaccumulation: In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

Data for Component: 1,1,1,2-Tetrafluoroethane

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): 1.68 Estimated.

Mobility in soil

Data for Component: Diphenylmethane Diisocyanate, isomers and homologues

Mobility in soil: No data available for assessment due to technical difficulties with testing.

Henry's Law Constant (H): No relevant data found.:

Data for Component: 4,4' -Methylenediphenyl diisocyanate

Mobility in soil: No data available for assessment due to technical difficulties with testing.

Data for Component: 1,1,1,2-Tetrafluoroethane

Mobility in soil: Potential for mobility in soil is high (Koc between 50 and 150).

Partition coefficient, soil organic carbon/water (Koc): 97 Estimated.

Henry's Law Constant (H): 5.00E-02 atm*m3/mole; 25 °C Measured

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

14. Transport Information

DOT Non-Bulk

Proper Shipping Name: COMPRESSED GAS, N.O.S.

Technical Name: FLUORINATED HYDROCARBONS

Hazard Class: 2.2 **ID Number:** UN1956

DOT Bulk

Proper Shipping Name: COMPRESSED GAS, N.O.S.

Technical Name: FLUORINATED HYDROCARBONS

Hazard Class: 2.2 **ID Number:** UN1956

IMDG

Proper Shipping Name: COMPRESSED GAS, N.O.S.

Technical Name: FLUORINATED HYDROCARBONS

Hazard Class: 2.2 **ID Number:** UN1956

EMS Number: F-C,S-V

Marine pollutant.: No

ICAO/IATA

Proper Shipping Name: COMPRESSED GAS, N.O.S.

Technical Name: FLUORINATED HYDROCARBONS

Hazard Class: 2.2 **ID Number:** UN1956 **Cargo Packing Instruction:** 200

Passenger Packing Instruction: 200

Additional Information

Reportable quantity: 5,556 lb – MDI

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the

transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	Yes

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
4,4' -Methylenediphenyl diisocyanate	101-68-8	>= 30.0 - <= 60.0 %
Diphenylmethane Diisocyanate, isomers and homologues	9016-87-9	>= 60.0 - <= 100.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
4,4' -Methylenediphenyl diisocyanate	101-68-8	>= 30.0 - <= 60.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Recommended Uses and Restrictions

Component(s) for the manufacture of urethane polymers.

Revision

Identification Number: 64144 / 1001 / Issue Date 05/06/2011 / Version: 4.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.