



# Material Safety Data Sheet

The Dow Chemical Company

**Product Name:** GREAT STUFF (TM) 12OZ ENG/SP Polyurethane Foam Sealant

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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

GREAT STUFF (TM) 12OZ ENG/SP Polyurethane Foam Sealant

### COMPANY IDENTIFICATION

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

Customer Information Number: 800-258-2436

### EMERGENCY TELEPHONE NUMBER

**24-Hour Emergency Contact:** 989-636-4400

**Local Emergency Contact:** 989-636-4400

## 2. Hazards Identification

### Emergency Overview

**Color:** Yellow

**Physical State:** Foam

**Odor:** Mild

### Hazards of product:

**DANGER!** Flammable gas - May cause flash fire. May cause allergic skin reaction. May cause allergic respiratory reaction. May cause eye irritation. May cause skin irritation. Vapor reduces oxygen available for breathing. May cause anesthetic effects. May cause respiratory tract irritation. Vapors may travel a long distance; ignition and/or flash back may occur. Evacuate area. Keep upwind of spill. Stay out of low areas. Aerosol cans exposed to fire can rupture becoming flaming projectiles. Elevated temperatures can cause hazardous polymerization. Toxic fumes may be released in fire situations. Containers are under high pressure. Avoid temperatures above 49 °C (120 °F).

### OSHA Hazard Communication Standard

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 eye irritation. May cause slight temporary corneal injury.

**Skin Contact:** Prolonged contact may cause moderate skin irritation with local redness. Material may stick to skin causing irritation upon removal. 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. May cause central nervous system depression. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Decreased lung function has been associated with overexposure to isocyanates.

**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.

**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. Contains component(s) which have been reported to cause effects on the following organs in animals: Kidney. Liver. Bone marrow. Contains a component which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions.

**Cancer Information:** Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m<sup>3</sup>) 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.

**3. Composition Information**

| Component   | CAS #      | Amount              |
|---|------------|---------------------|
| Methyl ether  | 115-10-6   | >= 1.0 - <= 5.0 %   |
| Propane   | 74-98-6    | >= 1.0 - <= 5.0 %   |
| Paraffin waxes and Hydrocarbon waxes, chlorinated   | 63449-39-8 | >= 5.0 - <= 10.0 %  |
| Isobutane   | 75-28-5    | >= 7.0 - <= 13.0 %  |
| Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly | 57029-46-6 | >= 30.0 - <= 60.0 % |
| Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer   | 53862-89-8 | >= 10.0 - <= 30.0 % |
| Diphenylmethane Diisocyanate, isomers and homologues  | 9016-87-9  | >= 10.0 - <= 30.0 % |
| Tris(1-chloro-2-propyl) phosphate   | 13674-84-5 | >= 5.0 - <= 10.0 %  |
| 4,4' -Methylenediphenyl diisocyanate  | 101-68-8   | >= 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

**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.

**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.

**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.

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

**Notes to Physician:** Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. 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. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Although cholinesterase depression has been reported with this material, it is not of benefit in determining exposure and need not be considered in the treatment of persons exposed to the material. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

**Medical Conditions Aggravated by Exposure:** Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

## 5. Fire Fighting Measures

**Extinguishing Media:** Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

**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 may not be effective in extinguishing fire. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Eliminate ignition sources. 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.

**Unusual Fire and Explosion Hazards:** Contains flammable propellant. Aerosol cans exposed to fire can rupture and become flaming projectiles. Propellant release may result in a fireball. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Dense smoke is produced when product burns.

**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 chloride. Carbon monoxide. Carbon dioxide.

## 6. Accidental Release Measures

**Steps to be Taken if Material is Released or Spilled:** Contain spilled material if possible. Ground and bond all containers and handling equipment. Isolate area until gas has dispersed. Use non-sparking tools in cleanup operations. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Collect in suitable and properly labeled containers. Absorb with materials such as: Clay. Dirt. Milsorb®. Sand. Sawdust. Vermiculite. See Section 10 for more specific information. See Section 13, Disposal Considerations, for additional information.

**Personal Precautions:** Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

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

## 7. Handling and Storage

### Handling

**General Handling:** Keep away from heat, sparks and flame. Avoid contact with eyes. Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. Keep out of reach of children. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. 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. Never use air pressure for transferring product. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

### Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame. Store in a dry place. See Section 10 for more specific information.

**Shelf life: Use within**

12 Months

20 - 30 °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/m <sup>3</sup> 0.02 ppm    |
| Methyl ether | WEEL           | TWA     | 1,880 mg/m <sup>3</sup> 1,000 ppm |
| Isobutane    | ACGIH          | TWA     | 1,000 ppm                         |
| Propane      | OSHA Table Z-1 | PEL     | 1,800 mg/m <sup>3</sup> 1,000 ppm |
|              | ACGIH          | TWA     | 1,000 ppm                         |

**Personal Protection**

**Eye/Face Protection:** Use safety glasses. Eye wash fountain should be located in immediate work area.

**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. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

**Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Viton. Polyvinyl chloride ("PVC" or "vinyl"). **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. 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.

**9. Physical and Chemical Properties**

|  |  |
|--|--|
| <b>Physical State</b>                        | Foam   |
| <b>Color</b>                                 | Yellow   |
| <b>Odor</b>                                  | Mild   |
| <b>Flash Point - Closed Cup</b>              | -104 °C (-155 °F) Calculated   |
| <b>Flammable Limits In Air</b>               | <b>Lower:</b> No test data available<br><b>Upper:</b> No test data available |
| <b>Autoignition Temperature</b>              | No test data available   |
| <b>Vapor Pressure</b>                        | 1,151 kPa @ 55 °C Container is under pressure.                               |
| <b>Boiling Point (760 mmHg)</b>              | Not applicable.  |
| <b>Vapor Density (air = 1)</b>               | No test data available   |
| <b>Specific Gravity (H<sub>2</sub>O = 1)</b> | 1.06 <i>Estimated</i>  |

|  |                        |
|--|------------------------|
| <b>Freezing Point</b>                  | No test data available |
| <b>Melting Point</b>                   | No test data available |
| <b>Solubility in Water (by weight)</b> | Insoluble              |
| <b>pH</b>                              | <i>Not applicable</i>  |
| <b>Kinematic Viscosity</b>             | Not applicable         |

## 10. Stability and Reactivity

### Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7. Unstable at elevated temperatures.

**Conditions to Avoid:** Avoid temperatures above 49 °C (120 °F). Elevated temperatures can cause container to vent and/or rupture. Exposure to elevated temperatures can cause product to decompose.

**Incompatible Materials:** Avoid contact with: Acids. Alcohols. Amines. Ammonia. Bases. Metal compounds. Strong oxidizers. Products based on diisocyanates like TDI and MDI react with many materials to release heat. The reaction rate increases with temperature as well as with increased contact; these reactions can become violent. Contact is increased by stirring or if the other material acts as a solvent. Products based on diisocyanates such as TDI and MDI are not soluble in water and will 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.

### Hazardous Polymerization

Can occur. Elevated temperatures can cause hazardous polymerization.

### Thermal Decomposition

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

#### Skin Absorption

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

#### Inhalation

The LC50 has not been determined. Estimated LC50, Aerosol, Rat > 0.5 mg/l

### 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. Contains component(s) which have been reported to cause effects on the following organs in animals: Kidney. Liver. Bone marrow. Contains a component which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching,

tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions.

**Chronic Toxicity and Carcinogenicity**

Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m<sup>3</sup>) 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.

**Genetic Toxicology**

In vitro genetic toxicity studies were negative for component(s) tested. 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**

**CHEMICAL FATE**

Data for Component: **Methyl ether**

**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

**Henry's Law Constant (H):** 9.78E-4 atm\*m<sup>3</sup>/mole; 25 °C Measured

**Partition coefficient, n-octanol/water (log Pow):** 0.10 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 1.29 - 14 Estimated

**Persistence and Degradability**

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

**Indirect Photodegradation with OH Radicals**

| Rate Constant               | Atmospheric Half-life | Method    |
|-----------------------------|-----------------------|-----------|
| 1.66E-12 cm <sup>3</sup> /s | 6.4 d                 | Estimated |

**OECD Biodegradation Tests:**

| Biodegradation | Exposure Time | Method         |
|----------------|---------------|----------------|
| 5 %            | 28 d          | OECD 301A Test |

**Theoretical Oxygen Demand:** 2.08 mg/mg

Data for Component: **Propane**

**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

**Henry's Law Constant (H):** 7.07E-01 atm\*m<sup>3</sup>/mole; 25 °C Measured

**Partition coefficient, n-octanol/water (log Pow):** 2.36 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 24 - 460 Estimated

**Distribution in Environment: Mackay Level 1 Fugacity Model:**

| Air   | Water. | Biota | Soil | Sediment |
|-------|--------|-------|------|----------|
| 100 % | 0 %    | 0 %   | 0 %  | 0 %      |

**Persistence and Degradability**

No relevant information found.

**Indirect Photodegradation with OH Radicals**

| Rate Constant               | Atmospheric Half-life | Method    |
|-----------------------------|-----------------------|-----------|
| 1.27E-12 cm <sup>3</sup> /s | 8.4 d                 | Estimated |

**Theoretical Oxygen Demand:** 3.64 mg/mg

Data for Component: **Paraffin waxes and Hydrocarbon waxes, chlorinated**

**Movement & Partitioning**

Expected to be relatively immobile in soil (Koc > 5000). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Henry's Law Constant (H):** < 1.0E-07 atm\*m3/mole; 25 °C Estimated

**Partition coefficient, n-octanol/water (log Pow):** > 6 Estimated

**Persistence and Degradability**

Expected to degrade only slowly in the environment.

Data for Component: **Isobutane**

**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

**Henry's Law Constant (H):** 1.19E+00 atm\*m3/mole; 25 °C Measured

**Partition coefficient, n-octanol/water (log Pow):** 2.76 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 35 Estimated

**Distribution in Environment: Mackay Level 1 Fugacity Model:**

| Air   | Water. | Biota | Soil | Sediment |
|-------|--------|-------|------|----------|
| 100 % | 0 %    | 0 %   | 0 %  | 0 %      |

**Persistence and Degradability**

Biodegradation may occur under aerobic conditions (in the presence of oxygen).

**Indirect Photodegradation with OH Radicals**

| Rate Constant  | Atmospheric Half-life | Method    |
|----------------|-----------------------|-----------|
| 2.44E-12 cm3/s | 4.4 d                 | Estimated |

**Theoretical Oxygen Demand:** 3.58 mg/mg

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.,.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly**

**Movement & Partitioning**

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

**Persistence and Degradability**

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.

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

**Movement & Partitioning**

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

**Persistence and Degradability**

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.

Data for Component: **Diphenylmethane Diisocyanate, isomers and homologues**

**Movement & Partitioning**

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

### Persistence and Degradability

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.

#### Data for Component: Tris(1-chloro-2-propyl) phosphate

##### Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is low (Koc between 500 and 2000).

**Henry's Law Constant (H):** < 1.35E-5 atm\*m3/mole; 25 °C Estimated

**Partition coefficient, n-octanol/water (log Pow):** 2.59 Measured

**Partition coefficient, soil organic carbon/water (Koc):** 1,300 Estimated

**Bioconcentration Factor (BCF):** 0.8 - 4.6; common carp (Cyprinus carpio); Measured

### Persistence and Degradability

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

#### Indirect Photodegradation with OH Radicals

| Rate Constant  | Atmospheric Half-life | Method    |
|----------------|-----------------------|-----------|
| 4.47E-11 cm3/s | 0.24 d                | Estimated |

#### OECD Biodegradation Tests:

| Biodegradation | Exposure Time | Method         |
|----------------|---------------|----------------|
| 14 %           | 28 d          | OECD 301E Test |

**Theoretical Oxygen Demand:** 1.17 mg/mg

#### Data for Component: 4,4'-Methylenediphenyl diisocyanate

##### Movement & Partitioning

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

### Persistence and Degradability

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.

## ECOTOXICITY

#### Data for Component: Methyl ether

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

##### Fish Acute & Prolonged Toxicity

LC50, guppy (Poecilia reticulata), 96 h: > 4,000 mg/l

##### Aquatic Invertebrate Acute Toxicity

LC50, water flea Daphnia magna, 48 h: > 4,000 mg/l

#### Data for Component: Propane

No relevant information found.

#### Data for Component: Paraffin waxes and Hydrocarbon waxes, chlorinated

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L). Material is very highly toxic to aquatic invertebrates on an acute basis (LC50/EC50 < 0.1 mg/L).

##### Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss), static, 96 h: > 100 mg/l

##### Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, immobilization: 0.037 mg/l

#### Data for Component: Isobutane

No relevant information found.

Data for Component: **Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.,.alpha.',.alpha."-1,2,3-propanetriyltris[.omega.-hydroxypoly**

|| 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 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

|| LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **Polymethylenepolyphenyl polyisocyanate, polypropyleneglycol copolymer**

|| 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 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

|| LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

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 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

|| LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: **Tris(1-chloro-2-propyl) phosphate**

|| Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

**Fish Acute & Prolonged Toxicity**

|| LC50, bluegill (*Lepomis macrochirus*), 96 h: 84 mg/l

**Aquatic Invertebrate Acute Toxicity**

|| EC50, water flea *Daphnia magna*, 48 h, immobilization: 63 mg/l

**Aquatic Plant Toxicity**

|| EC50, green alga *Selenastrum capricornutum*, biomass growth inhibition, 96 h: 47 mg/l

|| EC50, alga *Scenedesmus* sp., biomass growth inhibition, 72 h: 45 mg/l

**Toxicity to Micro-organisms**

|| EC50, OECD 209 Test; activated sludge, respiration inhibition, 3 h: 784 mg/l

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 >100 mg/L in the most sensitive species tested).

**Toxicity to Soil Dwelling Organisms**

|| LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

## 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. DOW HAS 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

CONSUMER COMMODITY RECLASSIFIED AS ORM-D MATERIAL

### DOT Bulk

NOT AVAILABLE IN BULK CONTAINERS

### IMDG

**Proper Shipping Name:** AEROSOLS, FLAMMABLE

**Hazard Class:** 2.1    **ID Number:** UN1950

**EMS Number:** F-D,S-U

LIMITED QUANTITY

### ICAO/IATA

**Proper Shipping Name:** AEROSOLS, FLAMMABLE

**Hazard Class:** 2.1    **ID Number:** UN1950 **Cargo Packing Instruction:** 203

**Passenger Packing Instruction:** 203

LIMITED QUANTITY

*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                       | Yes |
| Reactive Hazard                   | No  |
| 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.

| <b>Component</b>                                     | <b>CAS #</b> | <b>Amount</b>       |
|--|--------------|---------------------|
| 4,4' -Methylenediphenyl diisocyanate                 | 101-68-8     | >= 5.0 - <= 10.0 %  |
| Diphenylmethane Diisocyanate, isomers and homologues | 9016-87-9    | >= 10.0 - <= 30.0 % |

**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 | >= 5.0 - <= 10.0 % |
| Methyl ether                         | 115-10-6 | >= 1.0 - <= 5.0 %  |
| Propane                              | 74-98-6  | >= 1.0 - <= 5.0 %  |
| Isobutane                            | 75-28-5  | >= 7.0 - <= 13.0 % |

**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**

|| Polyurethane foam.

**Revision**

Identification Number: 63953 / 1001 / Issue Date 01/31/2008 / Version: 2.0

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.*