



Green Structures NW

PO Box 6140 Salem, Oregon 97304 | 503.581.2029 | 509.995.7801 | 503.339.9570 (fax) | OR CCB# 192376 | WA# GREENSN891LG

MSDS

Material Safety Data Sheets

as of 02/21/2021

EPS - Material Safety Data Sheet

Section 1: Substance Identity and Company Information

Product Name: Northwest Foam Expanded Polystyrene Modified Grade
Manufacturer: Northwest Foam Products, Inc.
2390 Rostron Circle, Twin Falls, ID 83301
800-398-0804 (8am-5pm MT)
Chemical Name/Synonyms: Modified EPS, Modified Foam Polystyrene
Chemical Family: Ethenylbenzene Homopolymer
Chemical Formula: (C8H8)n

Section 2: Chemical Composition

Ingredient	CAS No.	Approx. Weight Percentage
Benzene, Ethenyl-, Homopolymer	9003-53-6	>98%
Hexabromocyclododecane (Fire Retardant)	3194-55-6	<1%
Pentane	109-66-0	<1%

Section 3: Hazards Identification

Primary route(s) of entry into body: Inhalation and ingestion

Acute effects:

Eyes: Dust particles may cause mechanical irritation.

Skin: Direct contact may cause slight skin irritation.

Inhalation: May cause respiratory discomfort similar to inhalation of too much "inert" dust.

Ingestion: Biologically inert.

Chronic effects in humans: No known adverse effects.

Section 4: First Aid Measures

Eye contact: Hold eyelids open and flush immediately with gentle stream of water for at least 15 minutes.

Seek medical attention if irritation persists.

Skin contact: Wash exposed areas with mild soap and water.

Inhalation: Move person to fresh air. If breathing is difficult seek medical attention.

Ingestion: Not likely to cause serious injury if ingested.

Section 5: Fire Fighting Measures

Flash Pt. and Method Used: 6750 F (ASTM D-1929 per bead manufacturers)

Special Fire fighting Instructions: Use self-contained breathing apparatus respirator and approved personal protective clothing.

Extinguishing Media: Water fog, carbon dioxide, foam and dry chemical.

Auto-Ignition Temperature: 8800 F (ASTM D-1929 per bead manufacturers)

Unusual Fire and Explosion Hazards: Combustion causes dense, black smoke. Smoke consists of carbon monoxide, carbon dioxide and styrene. Other undetermined hydrocarbon fractions could be released in small quantities.

Section 6: Accidental Release Measures

Spill or leak procedures: Pickup or if material is in small pieces, sweep up and place in suitable container for disposal

Reportable Quantity: None

Disposal Method: Recycle, incinerate with waste heat recovery, or landfill in accordance with federal, state and local regulations.

Section 7: Handling and Storage

Storage: Although expanded polystyrene contains a fire retardant additive, it is considered combustible and adequate protection from sources of ignition should be taken.

Section 8: Exposure Controls and Personal Protection

Personal protective equipment:

Respiratory Protection: Use approved dust mask when sawing or sanding

Gloves: none required

Eye Protection: Use approved safety glasses/goggles when sawing or sanding.

Section 9: Physical and Chemical Properties

Appearance: Rigid blocks or boards Melting Point: Not Applicable (softening begins at 1600 F)

Odor: Slight hydrocarbon odor.
Physical state: Solid
Color: White
Boiling Point: Not Applicable
pH: Not Applicable

Volatiles by Volume: <2
Vapor Density (Air=1): Not Applicable
Evaporation Rate: None
Solubility in water: Insoluble
Specific gravity: <1

Section 10: Stability and Reactivity

Stability: The product is stable.

Conditions to Avoid: Fire and high temperatures.

Incompatibility: Hydrocarbons, esters, insecticides, amines and aldehydes.

Hazardous polymerization: None.

Hazardous decomposition: Carbon monoxide, acid gases, water, carbon dioxide, carbon.

Section 11: Toxicological Information

Ventilation: No special ventilation requirements

Personal protective equipment:

Respiratory Protection: Use approved dust mask when sawing or sanding

Gloves: none required

Eye Protection: Use approved safety glasses/goggles when sawing or sanding.

Section 12: Ecological Information

Biologically Inert

Section 13: Disposal Considerations

Non hazardous waste. Dispose of material according to local, state, federal regulations.

Section 14: Transport Information

Not a "Hazardous Material"

Section 15: Regulations

TSCA Status: Listed

Hazard Ratings: Health: 0 Fire: 2 Reactivity: 0

Section 16: Other Information

Expanded Polystyrene materials sold for construction use have a fire retardant modifier but are considered combustible, as are all organic materials. They must not be stored or installed near open flame or any other source of ignition. In addition, when EPS insulation is installed in the interior of a structure it must be protected by a proper thermal barrier, and the installer must review applicable local, state and federal building codes to determine the correct thermal barrier for the particular application

The information in the MSDS was obtained from sources which we believe are reliable. However the information is provided without any warranty, express or implied, regarding it's correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Polyol SDS pages 15-29

Effective Date: 03/15/10

NOTICE

The Material Safety Data Sheet information for the two component FROTH-PAK(TM) Sealant 200HFC Kit is contained in two separate datasheets; one for the isocyanate and one for the polyol. When printing or filing, please be sure to include both documents.



Material Safety Data Sheet

The Dow Chemical Company

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

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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

Polyurethane System – Isocyanate

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: Brown

Physical State: Liquid.

Odor: Musty

Product: FROTH-PAK(TM) Sealant 200HFC Kit

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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

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.

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.

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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

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.

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 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.

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

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Emergency Personnel Protection: 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.

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. May spread 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 is not recommended, but may be applied in large quantities as a fine spray when other extinguishing

agents are not available. 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. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. 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. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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: Some components of this product will burn in a fire situation. 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. Blowing agent vaporizes quickly at room temperature. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. 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 cyanide. Carbon monoxide. Carbon dioxide. Hydrogen halides. Halogenated hydrocarbons.

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6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Absorb with materials such as: Vermiculite. Dirt. 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.

Personal Precautions: Isolate area. Ventilate area of leak or spill. Keep personnel out of low areas. Keep upwind of spill. Keep unnecessary and unprotected personnel from entering the area. 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.

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:

12 Months

Storage temperature:

15 - 27 °C

8. Exposure Controls / Personal Protection

Exposure Limits

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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
1,1,1,2-Tetrafluoroethane	AIHA WEEL	TWA	4,240 mg/m3 1,000 ppm

Personal Protection

Eye/Face Protection: Use chemical goggles. 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. 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

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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

Physical State	Liquid.
Color	Brown
Odor	Musty
Odor Threshold	No test data available
Flash Point - Closed Cup	Not applicable
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	240 psi @ 23 °C <i>Estimated</i> . Container is under pressure.
Boiling Point (760 mmHg)	No test data available.
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.24 <i>Estimated</i> .
Freezing Point	No test data available
Melting Point	No test data available
Solubility in water (by weight)	insoluble, reacts, evolution of CO2
pH	Not applicable
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	No test data available
Kinematic Viscosity	No test data available

10. Stability and Reactivity

Stability/Instability

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

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. 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

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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. Water. Ammonia. Bases. Metal compounds. Moist air. 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 contact with metals such as: Aluminum. Zinc. Brass. Tin. Copper. Galvanized metals. Avoid contact with absorbent materials such as: Moist organic absorbents. Avoid unintended contact with polyols. The reaction of polyols and isocyanates generate heat.

Hazardous Polymerization

Can occur. Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by: Strong bases. Water.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. 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 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

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

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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

ENVIRONMENTAL FATE

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: **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.

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

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

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

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

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

Persistence and Degradability

1,1,1,2-Tetrafluoroethane (HFC-134a) has a stratospheric ozone depletion potential (ODP) of zero, relative to CFC 12 (ODP=1). 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
6.20E-15 cm3/s	1,700 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
4 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.47 mg/mg

ECOTOXICITY

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).

Toxicity to Soil Dwelling Organisms

LC50, 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).

Toxicity to Soil Dwelling Organisms

LC50, 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

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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

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.

14. Transport Information

DOT Non-Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

DOT Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

IMDG

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

EMS Number: F-C,S-V

Marine pollutant.: No

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ICAO/IATA

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

Passenger Packing Instruction: 200

Additional Information

Reportable quantity: 8,333 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
Yes

Delayed (Chronic) Health Hazard

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:

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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: 1041164 / 1001 / Issue Date 12/16/2009 / Version: 1.0

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

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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.



Material Safety Data Sheet

The Dow Chemical Company

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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

Polyurethane System - Polyol

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: Liquid.

Odor: Characteristic

Hazards of product:

CAUTION! May cause eye irritation. May be harmful if inhaled. Vapor reduces oxygen available for breathing. May cause anesthetic effects. May cause central nervous system effects; may cause respiratory tract irritation. Isolate area. Keep upwind of spill. Contents under pressure.

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 slight eye irritation. May cause slight temporary corneal injury.

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

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

Inhalation: Prolonged excessive exposure may cause adverse effects. In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause respiratory irritation and central nervous system depression. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

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. Signs and symptoms of excessive exposure may include: May cause lacrimation (tears). Salivation. Convulsions. Tremors. Increased activity (hyperactivity).

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Effects of Repeated Exposure: 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. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

Birth Defects/Developmental Effects: Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

Reproductive Effects: In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

3. Composition Information

Component	CAS #	Amount
1,1,1,2-Tetrafluoroethane	811-97-2	>= 10.0 - <= 30.0 %
Glycerol propylene oxide polymer	25791-96-2	>= 10.0 - <= 30.0 %
Polyester polyol, aromatic	Not available	>= 10.0 - <= 30.0 %
Sucrose , propylene oxide polymer	9049-71-2	>= 10.0 - <= 30.0 %
Tris(1-chloro-2-propyl) phosphate	13674-84-5	>= 10.0 - <= 30.0 %
1,1,1,3,3 - Pentafluoropropane	460-73-1	>= 1.0 - <= 10.0 %
Triethyl phosphate	78-40-0	>= 1.0 - <= 5.0 %
Ethylene glycol	107-21-1	> 0.1 - < 1.0 %

4. First-aid measures

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Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

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: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Notes to Physician: Maintain adequate ventilation and oxygenation of the patient. This material is a cholinesterase inhibitor. Treat symptomatically. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. Attempt seizure control with diazepam 5-10 mg (adults) intravenous over 2-3 minutes. Repeat every 5-10 minutes as needed. Monitor for hypotension, respiratory depression, and need for intubation. Consider second agent if seizures persist after 30 mg. If seizures persist or recur administer phenobarbital 600-1200 mg (adults) intravenous diluted in 60 ml 0.9% saline given at 25-50 mg/minute. Evaluate for hypoxia, dysrhythmia, electrolyte disturbance, hypoglycemia (treat adults with dextrose 100 mg intravenous). If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). 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.

Emergency Personnel Protection: 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.

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. May spread 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. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. 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. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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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: Container may rupture from gas generation in a fire situation. Blowing agent vaporizes quickly at room temperature. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

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: Carbon monoxide. Carbon dioxide. Hydrogen halides.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust. Collect in suitable and properly labeled containers. Wash the spill site with water. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard. Refer to Section 7, Handling, for additional precautionary measures. 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.

7. Handling and Storage

Handling

General Handling: Avoid contact with eyes. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. This material is hygroscopic in nature. Contents under pressure. Do not puncture or incinerate container. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Other Precautions: Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage

Store under cover in a dry, clean, cool, well ventilated place away from sunlight.

Storage Period:

15 Months

Storage temperature:

24 °C

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8. Exposure Controls / Personal Protection
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Exposure Limits

Component	List	Type	Value
1,1,1,2-Tetrafluoroethane	AIHA WEEL	TWA	4,240 mg/m ³ 1,000 ppm
1,1,1,3,3 - Pentafluoropropane	AIHA WEEL	TWA	1,644 mg/m ³ 300 ppm
Ethylene glycol	ACGIH	Ceiling Aerosol.	100 mg/m ³

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). 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: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

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

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Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Yellow
Odor	Characteristic
Odor Threshold	No test data available
Flash Point - Closed Cup	> 100 °C (> 212 °F) <i>Estimated.</i>
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	Not applicable
Boiling Point (760 mmHg)	No test data available.
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.18 <i>Calculated</i>
Freezing Point	No test data available
Melting Point	No test data available
Solubility in water (by weight)	No test data available
pH	Not applicable
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	No test data available
Kinematic Viscosity	2,240 cSt <i>ASTM D4878</i>

10. Stability and Reactivity

Stability/Instability

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

Conditions to Avoid: Product can oxidize at elevated temperatures. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. Generation of gas during decomposition can cause pressure in closed systems.

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Incompatible Materials: Avoid contact with oxidizing materials. Avoid contact with: Strong acids. Strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

Hazardous Polymerization

Will not occur by itself.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to:

Carbon dioxide. Alcohols. Ethers. Hydrocarbons. Hydrogen halides. Ketones. Polymer fragments.

11. Toxicological Information

Acute Toxicity

Ingestion

As product. Single dose oral LD50 has not been determined. Estimated. LD50, Rat > 2,000 mg/kg

Dermal

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

Inhalation

As product. The LC50 has not been determined.

Serious eye damage/eye irritation

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

Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness.

Sensitization

Skin

No relevant information found.

Respiratory

No relevant information found.

Repeated Dose Toxicity

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. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

Chronic Toxicity and Carcinogenicity

No relevant information found.

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Developmental Toxicity

Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

Reproductive Toxicity

In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

Genetic Toxicology

Genetic toxicity studies on tested components were predominantly negative. Contains component(s) which were negative in some animal genetic toxicity studies and positive in others.

12. Ecological Information

ENVIRONMENTAL FATE

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

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

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

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

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

Persistence and Degradability

1,1,1,2-Tetrafluoroethane (HFC-134a) has a stratospheric ozone depletion potential (ODP) of zero, relative to CFC 12 (ODP=1). 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
6.20E-15 cm3/s	1,700 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
4 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.47 mg/mg

Data for Component: Glycerol propylene oxide polymer

Movement & Partitioning

Based on information for a similar material: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).

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Persistence and Degradability

For this family of materials: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Data for Component: Sucrose , propylene oxide polymer

Movement & Partitioning

No bioconcentration is expected because of the relatively high water solubility.

Persistence and Degradability

Based on information for a similar material: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

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-05 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: 1,1,1,3,3 - Pentafluoropropane

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is medium (Koc between 150 and 500).

Henry's Law Constant (H): 6.89E-02 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): 1.35 Measured

Partition coefficient, soil organic carbon/water (Koc): 280 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

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Rate Constant	Atmospheric Half-life	Method
2.97E-14 cm ³ /s	360 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
8 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.60 mg/mg

Data for Component: Triethyl phosphate

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). 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): 3.60E-08 atm*m³/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 0.80 Measured

Partition coefficient, soil organic carbon/water (Koc): 48 Estimated.

Persistence and Degradability

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD₂₀ or BOD₂₈/ThOD < 2.5%).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
5.794E-11 cm ³ /s	0.18 d	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
0 %			

Theoretical Oxygen Demand: 1.58 mg/mg

Data for Component: Ethylene glycol

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). 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): 8.05E-09 atm*m³/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): -1.36 Measured

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

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
2.1 %	98 %	< 0.01 %	< 0.01 %	< 0.01 %

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

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Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.32E-12 cm ³ /s	15 h	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
> 94 %	28 d	OECD 301F Test
90 %	1 d	OECD 302B Test

Theoretical Oxygen Demand: 1.29 mg/mg

ECOTOXICITY

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

Data for Component: Glycerol propylene oxide polymer

For this family of materials: 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).

Data for Component: Sucrose , propylene oxide polymer

Based on information for a similar material: 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).

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 *Pseudokirchneriella subcapitata* (formerly known as *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: 1,1,1,3,3 - Pentafluoropropane

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).

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Fish Acute & Prolonged Toxicity

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

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, static, 48 h, immobilization: > 100 mg/l

Data for Component: Triethyl phosphate

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

Fish Acute & Prolonged Toxicity

LC50, Japanese medaka (*Oryzias latipes*), static, 48 h: > 500 mg/l

Data for Component: Ethylene glycol

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: 18,000 - 46,000 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, static, 48 h: 46,300 - 51,100 mg/l

Aquatic Plant Toxicity

EC50, green alga *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*), biomass growth inhibition, 96 h: 9,500 - 13,000 mg/l

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, respiration inhibition, 30 min: 225 mg/l

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: Recycler. Reclaimer. Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section 10 Regulatory Information, MSDS Section 15

14. Transport Information

DOT Non-Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Effective Date: 03/15/10

Polyol SDS pages 15-28

Hazard Class: 2.2 ID Number: UN1956

DOT Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Hazard Class: 2.2 ID Number: UN1956

IMDG

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Hazard Class: 2.2 ID Number: UN1956

EMS Number: F-C,S-V

ICAO/IATA

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

Passenger Packing Instruction: 200

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	No
Fire Hazard	No
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

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

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Effective Date: 03/15/10

Polyol SDS pages 15-28

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

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

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)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
1,4-Dioxane	123-91-1	<= 0.016 %

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

Revision

Identification Number: 1042556 / 1001 / Issue Date 03/09/2010 / Version: 1.0

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.

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10




Isocyanate SDS pages 2-14

Effective Date: 03/15/10

Polyol SDS pages 15-28

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.

Material Safety Data Sheet

NFPA 	HMIS <table border="1"><tr><td>Health Hazard</td><td>2*</td></tr><tr><td>Fire Hazard</td><td>4</td></tr><tr><td>Reactivity</td><td>1</td></tr></table>	Health Hazard	2*	Fire Hazard	4	Reactivity	1	PPE 	Transport Symbol 
Health Hazard	2*								
Fire Hazard	4								
Reactivity	1								

Issuing Date 27-Feb-2007

Revision Date 20-Aug-2012

Revision Number 4

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Touch 'n Seal® Gun Foam II Polyurethane Foam Sealant
Touch 'n Foam® Professional All-Purpose Foam Sealant

Recommended Use Insulation

Supplier Address Convenience Products, Division of Clayton Corp.
866 Horan Drive
Fenton, MO 63026-2416 USA
TEL: (636) 349-5333

Emergency Telephone Number Chemtel 1-800-255-3924
(813) 248-0585 outside US

2. HAZARDS IDENTIFICATION

WARNING!

Emergency Overview

Flammable gas. May cause flash fire.
Contents under pressure. Avoid temperatures above (120°F)
Irritating to eyes, respiratory system and skin.
May cause an allergic skin or respiratory reaction.
Vapor reduces oxygen available for breathing. Lower oxygen levels may cause anesthetic effects.
May cause drowsiness and dizziness.
Keep upwind of spill. Stay out of low areas.

Appearance Orange

Physical State Liquid Aerosol

Odor Faint hydrocarbon

Potential Health Effects

Principle Routes of Exposure Inhalation, Skin contact, Eye contact.

Acute Toxicity

Eyes
Skin

Irritating to eyes. May cause slight temporary corneal injury due to adhesive character.
Prolonged skin contact may cause moderate skin irritation with local redness. May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Will bond to skin causing irritation upon removal.

Skin Absorption

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

Inhalation

Excessive exposure may cause irritation to upper respiratory tract. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Inhalation of vapors in high concentration may cause shortness of breath (lung edema).

Respiratory Sensitization:

May cause allergy or asthma symptoms or breathing difficulties if inhaled. 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.

Ingestion	May be harmful if swallowed. May cause additional affects as listed under "Inhalation". Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Product may cure in the gastrointestinal tract and form an obstruction. May cause adverse cardiac effects, blood disturbances, and metabolic acidosis.
Chronic Effects	Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI / Polymeric MDI aerosols. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Chronic hydrocarbon abuse has been associated with irregular heart rhythms and potential cardiac arrest. Repeated or prolonged contact causes sensitization, asthma and eczemas.
Birth / Developmental Effects:	In laboratory animals, MDI/Polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses that were toxic to the mother.
Aggravated Medical Conditions	Allergies. Skin disorders. Respiratory disorders. Central nervous system. Preexisting eye disorders. Kidney disorders. Liver disorders.
Interactions with Other Chemicals	Irritants. Sensitizers. Epoxies. Use of alcoholic beverages may enhance toxic effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %
Flame Retardant	Proprietary	5-10
Polymethylene polyphenylene isocyanate	9016-87-9	10-30
Methylene bisphenyl isocyanate (MDI)	101-68-8	10-30
Polyol blend	Proprietary	10-30
Isobutane	75-28-5	5-10
Methylenediphenyl diisocyanate	26447-40-5	1-5
Propane	74-98-6	1-5
Dimethyl ether	115-10-6	5-10

4. FIRST AID MEASURES

General Advice	If emergency warrants call 911 or emergency medical service. Remove and wash soiled clothing before reuse.
Eye Contact	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Obtain medical attention, preferably from an ophthalmologist.
Skin Contact	Remove wet material from skin immediately with corn oil or nail polish that contains acetone. If irritation symptoms persist, call a physician. Remove contaminated clothing; wash before reuse. Foam will stick to skin; studies demonstrate that cleaning very soon after exposure is most effective. If foam dries on skin, apply generous amounts of petroleum jelly or lanolin, put on plastic gloves and wait 1 hour. With a clean cloth, firmly wipe off petroleum jelly and repeat process if necessary. Do not attempt to remove dried foam with solvents.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
Ingestion	Call a physician or Poison Control Center immediately. May produce an allergic reaction. Do not induce vomiting unless directed to do so by medical personnel. Drink plenty of water. Never give anything by mouth to an unconscious person.

Notes to Physician Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. May cause respiratory sensitization or asthma-like symptoms. Respiratory symptoms, including pulmonary edema, may be delayed. Exposure may increase "myocardial irritability". If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Protection of First-Aiders Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Flammable Properties	Aerosol cans exposed to fire can rupture and spread fire to other areas. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.
Flash Point	-104°C / -155°F (based on propellant.)
Suitable Extinguishing Media	Isolate fire and deny unnecessary entry. Use an extinguishing agent suitable for type of fire. Dry chemical, CO2, water spray, fog or regular foam. Stay upwind. Keep out of low areas where gas fumes can accumulate. Fire damaged cylinders should be handled with extreme caution and only by authorized personnel.
Explosion Data	
Sensitivity to mechanical impact	None
Sensitivity to static discharge	Yes.

Specific Hazards Arising from the Chemical

Propellant is flammable and will burn. Eliminate ignition sources. Ruptured cylinders may rocket. Chemicals other than propellant may burn but none ignite readily. Flash back possible over considerable distance. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes.

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus and protective suit.

NFPA	Health Hazard 2	Flammability 4	Stability 1	Physical and Chemical Hazards -
HMIS	Health Hazard 2*	Flammability 4	Stability 1	Personal Precautions -B

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Do not touch or walk through spilled material. Use appropriate safety equipment. Evacuate area. Keep personnel out of low areas and confined or poorly ventilated areas. Keep upwind of spill. Ensure adequate ventilation. Remove all sources of ignition. No smoking in area. Only trained and properly protected personnel must be involved in clean-up operations.
Methods for Containment	If possible, turn leaking containers so that gas escapes rather than liquid. Allow substance to evaporate. Contain spilled material if possible without risk. Absorb with materials such as: Sawdust. Dirt. Vermiculite. Collect in suitable and properly labeled open containers. Do not place in sealed containers. Curing foam gives off CO2. Wash what is left of the spill site with large quantities of water.
Methods for Cleaning Up	Attempt to neutralize the spilled material 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 formulation is used, use good ventilation to prevent vapor exposure. Sweep up and shovel into suitable containers for disposal.
Other Information	Ventilate the area. Curing foam gives off CO2. Do not put curing foam in a sealed drum.

7. HANDLING AND STORAGE

Handling Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Ensure adequate ventilation. Take necessary action to avoid static electricity discharge (which might cause ignition of organic propellant vapors). Keep away from open flames, hot surfaces and sources of ignition. Do not Smoke. Avoid breathing vapors or mists. Contents under pressure. Do not puncture or incinerate cans. 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 stick pin or any other sharp object into opening on top of can.

Storage Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers. Keep in an area equipped with sprinklers. Keep out of the reach of children. Ideal storage temperature is 16-32 °C / 60 – 90 °F. Storage above 32 °C / 90 °F will reduce its shelf-life. Never keep at temperatures above 48.8°C / 120°F.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Methylene bisphenyl isocyanate (MDI)	TWA: 0.005 ppm	Ceiling: 0.02 ppm Ceiling: 0.2 mg/m ³	75 mg/m ³
Isobutane	TWA: 1000 ppm	N/A	N/A
Propane	TWA: 2,500 ppm STEL 1,000ppm, 3,500 mg/m ³	8Hr TWA: 1000 ppm 1,800.0 mg/m ³	2100 ppm

NIOSH IDLH: Immediately Dangerous to Life or Health

Engineering Measures Showers
 Eyewash stations
 Ventilation systems

Personal Protective Equipment Eye/Face Protection

Safety glasses with side-shields.

Skin and Body protection

Impervious gloves. Lightweight protective clothing.

Respiratory Protection

Atmospheric levels of PMDI should be maintained below the exposure guidelines. If exposure limits are exceeded or irritation is experienced, use a NIOSH/MSHA approved air-purifying respirator equipped with an organic vapor absorbent and a particle filter. For situations where the atmospheric levels exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplied respirator. Respiratory protection must be provided in accordance with current local regulations.

Hygiene Measures

When using, do not eat, drink or smoke. Maintain regular cleaning of equipment, work area and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Orange	Odor	Faint hydrocarbon
Odor Threshold	No information available	Physical State	Liquid Aerosol
pH	No information available		
Flash Point	-104°C / -155°F (based on propellant.)	Autoignition Temperature	Not applicable
Decomposition temperature	No data available	Boiling Point/Range	-42°C / -44°F
Melting Point/Range	No data available	Viscosity	No information available
Flammability Limits in Air	No data available	Explosion Limits	No data available
Specific Gravity	1.05	Water Solubility	Not Compatible
Solubility	Compatible.	Evaporation Rate	No data available
Vapor Pressure	No data available	Vapor Density	No data available
		VOC	1.29 (lbs/gal) 155 (g/l)

10. STABILITY AND REACTIVITY

Stability	Stable under recommended storage conditions
Conditions to Avoid	Keep away from open flames, hot surfaces and sources of ignition. Temperatures above 48.8 °C / 120 °F. Exposure to elevated temperatures can cause product to decompose.
Incompatible Products	Water. Alcohols. Strong bases. Strong oxidizing agents. Finely powdered metals.
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO ₂), Nitrogen oxides (NO _x), Hydrogen cyanide.
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

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.

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.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Flame Retardant	>2000 mg/kg (Rat)	>2000 mg/kg (Rat) 23700 mg/kg (Rabbit)	>5.22 mg/L (Rat) 4 h
Polymethylene polyphenylene isocyanate	49 g/kg (Rat)	9400 mg/kg (Rabbit)	490 mg/m ³ (Rat) 4 h
Methylene bisphenyl isocyanate (MDI)	9200 mg/kg (Rat)	5000 mg/kg (Rat)	
Polyol blend	64 mL/kg (Rat)	20 mL/kg (Rabbit)	
Isobutane			658 mg/L (Rat) 4 h

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methylenediphenyl diisocyanate		6200 mg/kg (Rabbit)	0.369 mg/L (Rat) 4 h
Propane		658 mg/kg (Rat)	
Dimethyl ether			308.5 g/ m ³ (Rat) 4 h

Chronic Toxicity Repeated or prolonged exposure may cause central nervous system damage. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Chronic hydrocarbon abuse has been associated with irregular heart rhythms and potential cardiac arrest. Repeated or prolonged contact causes sensitization, asthma and eczemas.

Carcinogenicity There are no known carcinogenic chemicals in this product.

Mutagenicity Contains no known mutagenetic chemicals.

Reproductive Toxicity This product does not contain any known or suspected reproductive hazards

Target Organ Effects Contains component(s) that have been reported to cause effects on the following organs in animals: Kidney, Liver, Bone marrow.

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Fate

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

Persistence and Degradability: In the aquatic and terrestrial environment, PMDI reacts with water forming predominantly insoluble polyureas that 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 effects:

Chemical Name	Toxicity to Algae	Toxicity to Fish	Microtox	Daphnia Magna (Water Flea)
Flame Retardant	EC50 4.6 mg/L 72			LC50 3.8 - 5.5 mg/L 48 h
Methylenediphenyl diisocyanate	EC50 = 3230 mg/L 96 h			EC50 > 1000 mg/L 24 h
Dimethyl ether		LC50 (goldfish) 3677 mg/L, 96 h		LC50 1852 mg/L, 96 h

Chemical Name	Log Pow
Isobutane	2.88
Propane	2.3
Dimethyl ether	-0.18

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Should not be released into the environment. Dispose of in accordance with local regulations. Allow foam to cure before disposal.

Contaminated Packaging Dispose of in accordance with local regulations.

US EPA Waste Number D001

14. TRANSPORT INFORMATION

DOT

UN-No UN1950
Proper Shipping Name UN1950, Aerosols, flammable, 2.1, LTD QTY
Hazard Class 2.1
ERG Code Guide 127

TDG

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols, 2.1

MEX

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols, 2.1

ICAO

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols

IATA

UN-No UN1950
Proper Shipping Name Aerosols, flammable
Hazard Class 2.1
ERG Code 10L
Description UN1950, Aerosols, flammable, 2.1, LTD QTY

IMDG/IMO

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
EmS No. F-D, S-U
Description UN1950, Aerosols, Flammable, 2.1, LTD QTY

RID

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
Description UN1950, Aerosols, 2, RID
ADR/RID-Labels 2

ADR

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
ADR/RID-Labels 2

ADN

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
Special Provisions 63, 190, 191, 277, 913
Description UN1950, Aerosols, 2
Hazard Labels 2
Limited Quantity See SP277

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
CHINA	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

U.S. Federal Regulations

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

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals that are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values
Polymethylene polyphenylene isocyanate	9016-87-9	10-30	1.0
Methylene bisphenyl isocyanate (MDI)	101-68-8	10-30	1.0
Methylenediphenyl diisocyanate	26447-40-5	1-5	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	Yes
Reactive Hazard	No

Clean Water Act This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122)
CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Methylene bisphenyl isocyanate (MDI)	5000 lb	

U.S. State Regulations

California Proposition 65

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.

U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Dimethyl ether	X	X	X		X
Propane	X	X	X		X
Isobutane	X	X	X		
Methylene bisphenyl isocyanate (MDI)	X	X	X	X	X

International Regulations

Mexico - Grade

Serious risk, Grade 3

The exposure limits values for 101-68-8 are listed under two synonyms:

Diphenylmethane diisocyanate - 0.02 ppm TWA; 0.2 mg/m³ TWA

Methylene bisphenyl isocyanate - 0.005 ppm TWA; 0.051 mg/m³ TWA

Chemical Name	Carcinogen Status	Exposure Limits
Methylene bisphenyl isocyanate (MDI)		Mexico: TWA= 0.2 mg/m ³ Mexico: TWA= 0.02 ppm
Diphenylmethane diisocyanate		Mexico: TWA= 0.005 ppm Mexico: TWA= 0.051 mg/m ³

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

- A Compressed gases
- B5 Flammable aerosol
- D2B Toxic material



Chemical Name	NPRI
Methylene bisphenyl isocyanate (MDI)	X

Legend:

NPRI - National Pollutant Release Inventory
WHMIS – Workplace Hazardous Materials Information System
TSCA – Toxic Substance Control Act
DSL – Domestic Substance List
EINECS – European Inventory of Existing Commercial Chemical Substances
ENCS – Japan, Existing and New Chemical Substances
KECL- Korean Existing Chemical List
PICS – Philippine Inventory of Chemicals and Chemical Substances
AICS – Australian Inventory of Chemical Substances
TDG – Transportation of Dangerous Goods Act
ICAO – International Civil Aviation Organization
IATA – International Maritime Dangerous Goods Code
IMDG – International Maritime Dangerous Goods Code

16. OTHER INFORMATION

Issuing Date 27-Feb-2007
Revision Date 20-Aug-2012
Revision Note Revised DOT section

Disclaimer

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS



TECHNICAL BULLETIN

STRUCTURAL BOARD ASSOCIATION

Representing the OSB Industry

25 Valleywood Drive, Unit 27, Markham, Ontario, Canada L3R 5L9

Tel: 905-475-1100 • Fax: 905-475-1101 • E-mail: info@osbguide.com • website: http://www.osbguide.com

GENERIC ORIENTED STRAND BOARD MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

Product Name: Oriented Strand Board

Synonyms: OSB, Waferboard, Rim Board, Web Stock, Proprietary Brand Names

Note: Proprietary products may have slightly different ingredients or characteristics. Please check with manufacturer.

HAZARDOUS INGREDIENTS

Principal Hazardous Component (Common Name or Chemical)	Quantity (Percent)	Unit	ACGIH TLV		OSHA PEL ¹	
			TWA	STEL	TWA	STEL
Wood	85 - 97					
Softwood or Hardwood Total Dust		(mg/m ³)			15 ²	10 ³
Wood Dust - Not Preservative Treated:						
Inhalable - Western Red Cedar		(mg/m ³)	0.5	none		
Inhalable - All Other Species		(mg/m ³)	1	none		
Resin Solids:						
- Phenol Formaldehyde ⁴	0 - 15	ppm	0.3 ⁵	none	0.75	2
- Polymeric Diphenylmethane Diisocyanate ⁶	0 - 15	ppm	none	none	none	none
Paraffin Wax	0 - 2	(mg/m ³)	2	none	2	none

- Notes:
1. Values for State PEL (or Province OEL) may be more restrictive.
 2. Respirable fraction is limited to 5 mg/m³.
 3. Recommended exposure limits based on 1989 OSHA PELs: TWA 5 mg/m³ and STEL 10 mg/m³ for all softwoods and hardwoods, except western red cedar; TWA 2.5 mg/m³ for western red cedar.
 4. Product contains less than 0.05% free formaldehyde (CAS RN 50-00-0). Phenol formaldehyde resin is used in the surface material and/or centre material.
 5. Ceiling value.
 6. This ingredient is the polymerized form of MDI binder (CAS RN 101-68-8). There are no detectable MDI monomers in the product as purchased. MDI binder is generally used in the centre material only.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling point (degrees Centigrade)	n/a
Specific gravity (water = 1.0)	0.5 - 0.7
Percent volatile (by volume)	0
Evaporation rate	n/a
Vapour pressure (mm of Hg)	n/a
Vapour density	n/a
Solubility in Water (% by weight)	< 0.1%

Appearance and Odour - brown panel consisting of a ligno-cellulosic matrix of interlocking wood fibres with slight aromatic odour (stronger when wet). The wood component may consist of the following species: alder, aspen, beech, birch, cottonwood, eastern red cedar, fir, gum, hemlock, hickory, maple, oak, pecan, pine, poplar, spruce, yellow cypress, walnut, and/or western red cedar.

FIRE AND EXPLOSION DATA

Flashpoint	n/a
Flammable Limits	Lower n/a Upper n/a
Fire Extinguishing Media	Water, CO ₂ , sand
Auto Ignition Temperature	Variable, typically 400-500 °F (200-260 °C)
NFPA Rating (scale 0-4)	Health =1; Fire=1; Reactivity=0

Normal Fire-Fighting Procedures Equipment:

Determined by surrounding fire. Use a water spray to wet down panels and any dust to prevent ignition. Remove burned material to open area after fire is extinguished.

Usual Fire or Explosion Hazard: Fine panel dust in an airborne concentration greater than 40 g/m³ of air may explode if the dust cloud contacts a source of ignition.

REACTIVITY DATA

It is a stable product, however excess moisture conditions and open flame should be avoided. It is incompatible with oxidizing agents and drying oil. Good housekeeping procedures and routine disposal of panel dust is suggested. When burned it releases carbon monoxide, polycyclic aromatic hydrocarbons, carbon dioxide, aldehydes and other toxic fumes and gases. Hazardous polymerization will not occur.

HEALTH HAZARDS

Sign and Symptoms of Exposure

1. **Acute Overexposure:** Panel dust may be a mechanical irritant to eyes. Excessive concentration may cause deposit in nasal passages resulting in rhinorrhea, dry cough, wheezing, sinusitis.

2. **Chronic Overexposure:** Wood dust, depending on species, may cause dermatitis on prolonged, repetitive contact; may cause respiratory sensitisation and/or irritation. Prolonged exposure to wood dust has been reported by some observers to be associated with nasal cancer. IARC classifies wood dust as a Group 1 - carcinogen to humans. This classification is based on IARC's evaluation of increased risk in the occurrence of adeno-carcinomas of the nasal cavities and paranasal sinuses associated with the exposure to wood dust. IARC did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon, or rectum with exposure to wood dust.

Note: These products are manufactured using a phenol-formaldehyde thermoset resin and/or polyurethane binder. Maximum indoor formaldehyde levels associated with freshly manufactured panels are similar to outdoor background levels in urban areas (less than 0.1 ppm) and levels decrease through time as the panels age.

Medical Conditions Generally Aggravated by Exposure: Individuals with predisposing respiratory disease - asthma, chronic bronchitis - may have difficulty working around airborne particulates including dust.

Product Listed as Carcinogen - Formaldehyde

NTP Yes - Reasonably anticipated to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No - Regulated formaldehyde gas, potential carcinogen for exposures exceeding 0.5 ppm

Formaldehyde has been classified as a known carcinogen or probable carcinogen by NTP, IARC, and OSHA. A working group of IARC has determined that there is sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans, a rare form of cancer in developed countries.

Product Listed as Carcinogen - Wood Dust

NTP Yes - Known to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No

SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved dust respirator recommended under dusty conditions.

Ventilation: Local exhaust- Panel dust should be collected at source, so that exposure limits are met.

Protective Gloves: Leather, cloth or canvas recommended to minimize slivers or irritation when handling.

Eye Protection: Safety glasses or goggles recommended when machining.

Other Protective Clothing or Equipment: Follow good hygiene and housekeeping practices. Clean up areas where dust settles to avoid excessive accumulation of this combustible material. Minimize blowdown or other practices generating high dust concentrations.

EMERGENCY AND FIRST AID PROCEDURES

1. **Inhalation:** Remove to fresh air. If persistent irritation, severe coughing, breathing difficulties or rash occur, seek medical advice. (Primary route of exposure is inhalation).

2. **Eyes:** Panel dust may mechanically irritate the eye, resulting in redness or watering. Flush with water to remove dust particles. If irritation persists, seek medical attention.

3. **Skin:** Various species of wood dust can elicit allergic contact dermatitis in sensitized individuals after repetitive contact. If a rash, or persistent irritation or dermatitis occurs, seek medical advice before working where panel dust is present.

4. **Ingestion:** n/a

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage:

No special handling precautions are required. Panels are combustible. Keep in cool, dry place away from open flame and other sources of ignition.

Other Precautions: If this product is used in a process which generates dust levels in excess of the allowable exposure limit(s) for wood dust, a NIOSH approved dust respirator and goggles should be worn.

Due to the explosive potential of wood dust when suspended in air, precautions should be taken to prevent sparks or other ignition sources in ventilation systems. Use of totally enclosed motors is recommended (or may be warranted) if process generates excessive levels of wood dust.

Steps to be taken in Case Material is Released or

Spilled: Not applicable for product in purchased form. Panel dust may be vacuumed or shovelled for recovery or disposal. Avoid dusting conditions. Provide good ventilation where dusting is possible. Use NIOSH approved dust respirator and goggles where ventilation is not possible.

Waste Disposal Methods: If disposed or discarded in its purchased form, incineration is preferable. Dry land disposal may be acceptable. It is however the user's responsibility to determine at time of disposal whether the product meets federal, state, provincial or local regulations.

GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
C	degree Centigrade
CAS RN	Chemical Abstracts Service Registry Number (American Chemical Society)
F	degree Fahrenheit
IARC	International Agency for Research on Cancer
mg/m ³	milligrams per cubic meter of air
n/a	not applicable
NFPA	National Fire Protection Association (US)
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OEL	occupational exposure limit
OSHA	Occupational Safety and Health Administration (US)
PEL	permissible exposure level
ppm	parts per million in air
STEL	short term exposure limit (15 minutes)
TLV	threshold limit value
TWA	8 hour time weighted average

Important: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. SBA makes no warranty, express or implied, concerning the accuracy or completeness of the information and data herein and will not be liable for claims relating to any party's use of a reliance on the information and data contained herein. It is expected by SBA that the user of this information will confirm its accuracy and completeness with the supplier and/or manufacturer of the oriented strand board or waferboard product being purchased and/or used.

MATERIAL SAFETY DATA SHEET

MSDS Name: QB-300 MULTIPURPOSE CONSTRUCTION ADHESIVE
MSDS Number: 30011
Version Number 3
Revision Date: SEP-27-2005
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SECTION I - PRODUCT AND COMPANY INFORMATION

Product Name: QB-300 MULTIPURPOSE CONSTRUCTION
ADHESIVE
HMIS Hazard Rating: Health: 1 Fire: 3 Reactivity: 0 PPE: B

Company Identification: HENKEL CONSUMER ADHESIVES
7405 PRODUCTION DRIVE
MENTOR OH 44060

Contact (24 hour): Customer Affairs (800)321-0253
Information phone/Fax: (440) 255-8900 / (440) 974-8358
CHEMTREC Emergency (24 hour): (703) 527-3887 (International)
(800) 424-9300
in Canada CANUTEC 613-996-6666

Product Class ADHESIVE
Trade Name PRO-SERIES
Product Code 30011,30029

SECTION II - INGREDIENT AND HAZARD INFORMATION

Hazardous Ingredient Name	CAS Number	Percent	TSCA
Light Hydrotreated Naphtha	64742-49-0	15 - 25	Y

Ingredient Notes:
Remaining ingredients are not considered OSHA hazardous.

SECTION III - PHYSICAL AND CHEMICAL PROPERTIES

Form: Tan, non-sag mastic
Solubility (in water): insol.
pH Value, +/- .3: Not Applicable
Boiling Range: 135.°F - 165.°F (57.22°C - 73.89°C)
Vapor Pressure (mmHg): over 99.@ 68.°F (20.°C)
Evaporation Rate: 4.4 times Faster than n-Butyl Acetate

Vapor Density: Heavier than air

% Volatile, Weight 20.%
% Volatile, Volume 35.%
Specific Gravity: 1.36904
VOC (less H2O or exempt) 280 g/l (20%)

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NOTE:

*BOIL RANGE, EVAP RATE, VAPOR DENSITY AND PRESSURE FOR SOLVENT ONLY!

SECTION IV - FIRE FIGHTING MEASURES (Flash,UEL,LEL for solvent only)

Flammability Class: IB
Flash Range: approx. 0.F - 5.F (-17.78.C - -15.C)
Tag Closed Cup
Explosive Range (LEL/UEL): 1.% 6.7%

EXTINGUISHING MEDIA:

Carbon Dioxide---Dry Chemical---Foam
Use water fog to cool material in vicinity of fire.

SPECIAL FIRE-FIGHTING PROCEDURES:

Use self-contained breathing apparatus with full facepiece
operated in pressure demand with full protective equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Any closed container may rupture when exposed to extreme heat.
Solvent vapors are heavier than air and travel along the ground.
Vapors given off are flammable and may be ignited in air explosively.

SECTION V - HEALTH HAZARD DATA

ROUTES OF ENTRY:

ENTRY THROUGH
Inhalation? YES | Skin? YES | Ingestion? YES

Contains N-Hexane (110-54-3) in trace quantities, which can
cause peripheral neuropathy & nervous system damage.

CARCINOGENICITY...

NTP? N/E | IARC Monographs? N/E | OSHA? NO

EFFECTS OF OVEREXPOSURE

Eyes: Can cause irritation, redness, tearing and blurred vision.
Skin: Prolonged or repeated contact can cause moderate
irritation, drying of the skin, and dermatitis.
Inhalation: Excessive inhalation of vapors can cause respiratory
irritation, headache, drowsiness and fatigue. High
concentrations of vapors are anesthetic and may cause
central nervous system effects such as dizziness.
Ingestion: Can cause gastrointestinal irritation, nausea,
vomiting and diarrhea.

FIRST AID MEASURES

Eyes: Flush eyes gently with water for at least 15 minutes
lifting eyelids occasionally; get prompt medical attention

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Skin: Wash thoroughly with soap and water; apply a mild skin cream.
Remove contaminated clothing.
Inhalation: Move affected person to fresh air; if breathing is
difficult, administer oxygen; if breathing has stopped,
give artificial respiration. Get medical attention.
Ingestion: DO NOT INDUCE VOMITING! Get immediate medical attention.

CHRONIC HAZARDS

NOTICE: Reports have associated repeated and prolonged
occupational overexposure to solvents with permanent brain,
nervous system, liver or kidney damage or may cause cardiac
arrhythmia. INTENTIONAL misuse of this product by
deliberately inhaling its vapors may be harmful or fatal.

SECTION VI - STABILITY AND REACTIVITY

Stability: This product is stable
Hazardous Polymerization: Hazardous polymerization will not occur

INCOMPATIBILITY:

Keep away from strong oxidizing agents.

CONDITIONS TO AVOID:

Keep away from heat, spark, open flames and any ignition source.

HAZARDOUS DECOMPOSITION PRODUCTS:

Will produce fumes and smoke containing carbon monoxide and
dioxide under fire conditions.

SECTION VII - ACCIDENTAL RELEASE AND DISPOSAL MEASURES:

STEPS TO BE TAKEN IN CASE OF SPILL:

Eliminate all ignition sources. Ventilate confined areas.
(Open windows and doors). Wear appropriate protective clothing.
Cover with absorbent. Scoop into sealable safety container.

WASTE DISPOSAL METHOD:

Dispose of following local, state, and federal regulations.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Table with 5 columns: ACGIH TLV, ACGIH TLV-C, ACGIH STEL, OSHA STEL, OSHA PEL. Row 1: Light Hydrotreated Naphtha, 400.00 PPM, N/est, N/est, N/est, 400.00 PPM.

RESPIRATORY PROTECTION:

If TLV of the product is exceeded, a NIOSH/MSHA jointly approved
air supply respirator is advised in the absence of proper

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ventilation. OSHA regulations also permit the use of other types of NIOSH/MSHA respirators under specified conditions. (See your safety equipment supplier for more information)

VENTILATION:

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV. Ventilate during application and curing of this product.

PROTECTIVE CLOTHING:

Rubber gloves should be worn where skin contact is likely. Wear impervious clothing and shoes.

EYE PROTECTION:

Chemical goggles or safety glasses should be worn.

HANDLING AND STORAGE PRECAUTIONS:

Keep away from heat, spark and flame. Keep out of reach of children. Keep container closed while not in use. Do not cut or burn recepticals that have contained a solvent based product. Do not reuse this container. Use only in a well ventilated area.

N/A=NOT APPLICABLE N/AV=NOT AVAILABLE N/E, N/est=NOT ESTABLISHED

SECTION IX - TRANSPORT INFORMATION: (not all sizes available)

GROUND TRANSPORT (DOT) - DOMESTIC

Units less than 5L (1.3 gallons liquid) i.e.10oz, 28oz, 1 gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM-D
DOT Label Required: ORM-D
Shipping Document: CONSUMER COMMODITY, ORM-D
ERG Code: 171

Units GREATER than 5L i.e. 5 gal. pail

Proper Shipping Name: ADHESIVE
Classification: CLASS 3
DOT Label Required: Flammable Liquid, UN1133, Class 3
Shipping Document: ADHESIVE,3,UN1133, PGIII,
for 50 gal. drum use PG II
ERG Code: 128

AIR TRANSPORT (DOT) - DOMESTIC

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM-D
DOT Label Required: ORM-D-AIR

MATERIAL SAFETY DATA SHEET

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Shipping Document: Consumer Commodity, ORM-D
ERG Code: 171

Units GREATER than 5L i.e. 5 gal. pail
Proper Shipping Name: ADHESIVE
Classification: Class 3
DOT Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PG III,
for 50 gal. drum use PG II
ERG Code: 128

AIR TRANSPORT (IATA) - INTERNATIONAL

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1 gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: class 9
Label Required: ID8000
Shipping Document: Consumer Commodity,9, ID8000
ERG Code: 9L

Units GREATER than 5L i.e. 5 Gal. pail, 50 gal.drum
Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PGIII,
for 50 gal. drum use PG II
ERG Code: 3L

MARINE - OCEAN TRANSPORT (IMDG)

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1 gal.

Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN1133, Class 3, Ltd. Qty.
(on Ocean container only, not required on cartons)
Shipping Document: ADHESIVE,3, UN1133, PG III, LTD.QTY.
EMS Code: F-E, S-D

Units GREATER than 5L i.e. 5 gal. pail, 50 gal drum
Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PGIII,
for 50 gal. drum use PG II
EMS Code: F-E, S-D

SECTION X - REGULATORY INFORMATION:

MATERIAL SAFETY DATA SHEET

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SARA Section 311/312 Hazard Categories met: Fire Hazard,
Immediate (Acute) and Delayed (Chronic) Health Hazards.

Chemical ingredients are listed on the TSCA inventory.

SARA Section 313 toxic chemicals: NONE above the de minimis
reporting thresholds.

California PROP.65 Chemicals: none known

DISCLAIMER:

The information contained herein is based on data available as of the date of preparation of this MSDS and which we believe to be reliable. However, no warranty is expressed or implied regarding the accuracy of the data. We shall not be responsible for the use of this information, or of any product, method, apparatus mentioned, and user must make his own investigation to determine the suitability of the information or products for his particular purpose, for the protection of the environment, and the health & safety of the users of this material.

EPS - Material Safety Data Sheet

Section 1: Substance Identity and Company Information

Product Name: Northwest Foam Expanded Polystyrene Modified Grade
Manufacturer: Northwest Foam Products, Inc.
2390 Rostron Circle, Twin Falls, ID 83301
800-398-0804 (8am-5pm MT)
Chemical Name/Synonyms: Modified EPS, Modified Foam Polystyrene
Chemical Family: Ethenylbenzene Homopolymer
Chemical Formula: (C₈H₈)_n

Section 2: Chemical Composition

Ingredient	CAS No.	Approx. Weight Percentage
Benzene, Ethenyl-, Homopolymer	9003-53-6	>98%
Hexabromocyclododecane (Fire Retardant)	3194-55-6	<1%
Pentane	109-66-0	<1%

Section 3: Hazards Identification

Primary route(s) of entry into body: Inhalation and ingestion

Acute effects:

Eyes: Dust particles may cause mechanical irritation.

Skin: Direct contact may cause slight skin irritation.

Inhalation: May cause respiratory discomfort similar to inhalation of too much "inert" dust.

Ingestion: Biologically inert.

Chronic effects in humans: No known adverse effects.

Section 4: First Aid Measures

Eye contact: Hold eyelids open and flush immediately with gentle stream of water for at least 15 minutes.

Seek medical attention if irritation persists.

Skin contact: Wash exposed areas with mild soap and water.

Inhalation: Move person to fresh air. If breathing is difficult seek medical attention.

Ingestion: Not likely to cause serious injury if ingested.

Section 5: Fire Fighting Measures

Flash Pt. and Method Used: 6750 F (ASTM D-1929 per bead manufacturers)

Special Fire fighting Instructions: Use self-contained breathing apparatus respirator and approved personal protective clothing.

Extinguishing Media: Water fog, carbon dioxide, foam and dry chemical.

Auto-Ignition Temperature: 8800 F (ASTM D-1929 per bead manufacturers)

Unusual Fire and Explosion Hazards: Combustion causes dense, black smoke. Smoke consists of carbon monoxide, carbon dioxide and styrene. Other undetermined hydrocarbon fractions could be released in small quantities.

Section 6: Accidental Release Measures

Spill or leak procedures: Pickup or if material is in small pieces, sweep up and place in suitable container for disposal

Reportable Quantity: None

Disposal Method: Recycle, incinerate with waste heat recovery, or landfill in accordance with federal, state and local regulations.

Section 7: Handling and Storage

Storage: Although expanded polystyrene contains a fire retardant additive, it is considered combustible and adequate protection from sources of ignition should be taken.

Section 8: Exposure Controls and Personal Protection

Personal protective equipment:

Respiratory Protection: Use approved dust mask when sawing or sanding

Gloves: none required

Eye Protection: Use approved safety glasses/goggles when sawing or sanding.

Section 9: Physical and Chemical Properties

Appearance: Rigid blocks or boards Melting Point: Not Applicable (softening begins at 1600 F)

Odor: Slight hydrocarbon odor.
Physical state: Solid
Color: White
Boiling Point: Not Applicable
pH: Not Applicable

Volatiles by Volume: <2
Vapor Density (Air=1): Not Applicable
Evaporation Rate: None
Solubility in water: Insoluble
Specific gravity: <1

Section 10: Stability and Reactivity

Stability: The product is stable.

Conditions to Avoid: Fire and high temperatures.

Incompatibility: Hydrocarbons, esters, insecticides, amines and aldehydes.

Hazardous polymerization: None.

Hazardous decomposition: Carbon monoxide, acid gases, water, carbon dioxide, carbon.

Section 11: Toxicological Information

Ventilation: No special ventilation requirements

Personal protective equipment:

Respiratory Protection: Use approved dust mask when sawing or sanding

Gloves: none required

Eye Protection: Use approved safety glasses/goggles when sawing or sanding.

Section 12: Ecological Information

Biologically Inert

Section 13: Disposal Considerations

Non hazardous waste. Dispose of material according to local, state, federal regulations.

Section 14: Transport Information

Not a "Hazardous Material"

Section 15: Regulations

TSCA Status: Listed

Hazard Ratings: Health: 0 Fire: 2 Reactivity: 0

Section 16: Other Information

Expanded Polystyrene materials sold for construction use have a fire retardant modifier but are considered combustible, as are all organic materials. They must not be stored or installed near open flame or any other source of ignition. In addition, when EPS insulation is installed in the interior of a structure it must be protected by a proper thermal barrier, and the installer must review applicable local, state and federal building codes to determine the correct thermal barrier for the particular application

The information in the MSDS was obtained from sources which we believe are reliable. However the information is provided without any warranty, express or implied, regarding it's correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Polyol SDS pages 15-29

Effective Date: 03/15/10

NOTICE

The Material Safety Data Sheet information for the two component FROTH-PAK(TM) Sealant 200HFC Kit is contained in two separate datasheets; one for the isocyanate and one for the polyol. When printing or filing, please be sure to include both documents.



Material Safety Data Sheet

The Dow Chemical Company

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Polyol SDS pages 15-28

Effective Date: 03/15/10

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

Polyurethane System – Isocyanate

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: Brown

Physical State: Liquid.

Odor: Musty

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Effective Date: 03/15/10

Polyol SDS pages 15-28

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

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.

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.

Product: FROTH-PAK(TM) Sealant 200HFC Kit

Issue Date: 03/15/10

Isocyanate SDS pages 2-14

Effective Date: 03/15/10

Polyol SDS pages 15-28

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

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.

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 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.

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

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Emergency Personnel Protection: 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.

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. May spread 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 is not recommended, but may be applied in large quantities as a fine spray when other extinguishing

agents are not available. 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. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. 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. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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: Some components of this product will burn in a fire situation. 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. Blowing agent vaporizes quickly at room temperature. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. 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 cyanide. Carbon monoxide. Carbon dioxide. Hydrogen halides. Halogenated hydrocarbons.

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6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Absorb with materials such as: Vermiculite. Dirt. 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.

Personal Precautions: Isolate area. Ventilate area of leak or spill. Keep personnel out of low areas. Keep upwind of spill. Keep unnecessary and unprotected personnel from entering the area. 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.

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:

12 Months

Storage temperature:

15 - 27 °C

8. Exposure Controls / Personal Protection

Exposure Limits

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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
1,1,1,2-Tetrafluoroethane	AIHA WEEL	TWA	4,240 mg/m3 1,000 ppm

Personal Protection

Eye/Face Protection: Use chemical goggles. 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. 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

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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

Physical State	Liquid.
Color	Brown
Odor	Musty
Odor Threshold	No test data available
Flash Point - Closed Cup	Not applicable
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	240 psi @ 23 °C <i>Estimated</i> . Container is under pressure.
Boiling Point (760 mmHg)	No test data available.
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.24 <i>Estimated</i> .
Freezing Point	No test data available
Melting Point	No test data available
Solubility in water (by weight)	insoluble, reacts, evolution of CO2
pH	Not applicable
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	No test data available
Kinematic Viscosity	No test data available

10. Stability and Reactivity

Stability/Instability

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

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. 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

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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. Water. Ammonia. Bases. Metal compounds. Moist air. 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 contact with metals such as: Aluminum. Zinc. Brass. Tin. Copper. Galvanized metals. Avoid contact with absorbent materials such as: Moist organic absorbents. Avoid unintended contact with polyols. The reaction of polyols and isocyanates generate heat.

Hazardous Polymerization

Can occur. Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by: Strong bases. Water.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. 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 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

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

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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

ENVIRONMENTAL FATE

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: **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.

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

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

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

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

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

Persistence and Degradability

1,1,1,2-Tetrafluoroethane (HFC-134a) has a stratospheric ozone depletion potential (ODP) of zero, relative to CFC 12 (ODP=1). 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
6.20E-15 cm3/s	1,700 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
4 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.47 mg/mg

ECOTOXICITY

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).

Toxicity to Soil Dwelling Organisms

LC50, 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).

Toxicity to Soil Dwelling Organisms

LC50, 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

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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

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.

14. Transport Information

DOT Non-Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

DOT Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

IMDG

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

EMS Number: F-C,S-V

Marine pollutant.: No

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ICAO/IATA

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

Passenger Packing Instruction: 200

Additional Information

Reportable quantity: 8,333 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
Yes

Delayed (Chronic) Health Hazard

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:

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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

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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

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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.



Material Safety Data Sheet

The Dow Chemical Company

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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

Polyurethane System - Polyol

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: Liquid.

Odor: Characteristic

Hazards of product:

CAUTION! May cause eye irritation. May be harmful if inhaled. Vapor reduces oxygen available for breathing. May cause anesthetic effects. May cause central nervous system effects; may cause respiratory tract irritation. Isolate area. Keep upwind of spill. Contents under pressure.

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 slight eye irritation. May cause slight temporary corneal injury.

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

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

Inhalation: Prolonged excessive exposure may cause adverse effects. In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause respiratory irritation and central nervous system depression. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

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. Signs and symptoms of excessive exposure may include: May cause lacrimation (tears). Salivation. Convulsions. Tremors. Increased activity (hyperactivity).

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Effects of Repeated Exposure: 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. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

Birth Defects/Developmental Effects: Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

Reproductive Effects: In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

3. Composition Information

Component	CAS #	Amount
1,1,1,2-Tetrafluoroethane	811-97-2	>= 10.0 - <= 30.0 %
Glycerol propylene oxide polymer	25791-96-2	>= 10.0 - <= 30.0 %
Polyester polyol, aromatic	Not available	>= 10.0 - <= 30.0 %
Sucrose , propylene oxide polymer	9049-71-2	>= 10.0 - <= 30.0 %
Tris(1-chloro-2-propyl) phosphate	13674-84-5	>= 10.0 - <= 30.0 %
1,1,1,3,3 - Pentafluoropropane	460-73-1	>= 1.0 - <= 10.0 %
Triethyl phosphate	78-40-0	>= 1.0 - <= 5.0 %
Ethylene glycol	107-21-1	> 0.1 - < 1.0 %

4. First-aid measures

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Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

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: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Notes to Physician: Maintain adequate ventilation and oxygenation of the patient. This material is a cholinesterase inhibitor. Treat symptomatically. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. Attempt seizure control with diazepam 5-10 mg (adults) intravenous over 2-3 minutes. Repeat every 5-10 minutes as needed. Monitor for hypotension, respiratory depression, and need for intubation. Consider second agent if seizures persist after 30 mg. If seizures persist or recur administer phenobarbital 600-1200 mg (adults) intravenous diluted in 60 ml 0.9% saline given at 25-50 mg/minute. Evaluate for hypoxia, dysrhythmia, electrolyte disturbance, hypoglycemia (treat adults with dextrose 100 mg intravenous). If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). 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.

Emergency Personnel Protection: 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.

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. May spread 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. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. 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. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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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: Container may rupture from gas generation in a fire situation. Blowing agent vaporizes quickly at room temperature. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

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: Carbon monoxide. Carbon dioxide. Hydrogen halides.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Absorb with materials such as: Dirt. Sand. Sawdust. Collect in suitable and properly labeled containers. Wash the spill site with water. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard. Refer to Section 7, Handling, for additional precautionary measures. 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.

7. Handling and Storage

Handling

General Handling: Avoid contact with eyes. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. This material is hygroscopic in nature. Contents under pressure. Do not puncture or incinerate container. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Other Precautions: Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage

Store under cover in a dry, clean, cool, well ventilated place away from sunlight.

Storage Period:

15 Months

Storage temperature:

24 °C

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8. Exposure Controls / Personal Protection
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Exposure Limits

Component	List	Type	Value
1,1,1,2-Tetrafluoroethane	AIHA WEEL	TWA	4,240 mg/m ³ 1,000 ppm
1,1,1,3,3 - Pentafluoropropane	AIHA WEEL	TWA	1,644 mg/m ³ 300 ppm
Ethylene glycol	ACGIH	Ceiling Aerosol.	100 mg/m ³

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). 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: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

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

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Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Yellow
Odor	Characteristic
Odor Threshold	No test data available
Flash Point - Closed Cup	> 100 °C (> 212 °F) <i>Estimated.</i>
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	Not applicable
Boiling Point (760 mmHg)	No test data available.
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.18 <i>Calculated</i>
Freezing Point	No test data available
Melting Point	No test data available
Solubility in water (by weight)	No test data available
pH	Not applicable
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Evaporation Rate (Butyl Acetate = 1)	No test data available
Kinematic Viscosity	2,240 cSt <i>ASTM D4878</i>

10. Stability and Reactivity

Stability/Instability

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

Conditions to Avoid: Product can oxidize at elevated temperatures. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. Generation of gas during decomposition can cause pressure in closed systems.

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Incompatible Materials: Avoid contact with oxidizing materials. Avoid contact with: Strong acids. Strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

Hazardous Polymerization

Will not occur by itself.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to:

Carbon dioxide. Alcohols. Ethers. Hydrocarbons. Hydrogen halides. Ketones. Polymer fragments.

11. Toxicological Information

Acute Toxicity

Ingestion

As product. Single dose oral LD50 has not been determined. Estimated. LD50, Rat > 2,000 mg/kg

Dermal

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

Inhalation

As product. The LC50 has not been determined.

Serious eye damage/eye irritation

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

Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness.

Sensitization

Skin

No relevant information found.

Respiratory

No relevant information found.

Repeated Dose Toxicity

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. Contains component(s) which have been reported to cause effects on the following organs in animals: Heart.

Chronic Toxicity and Carcinogenicity

No relevant information found.

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Developmental Toxicity

Contains component(s) which, in laboratory animals, have been toxic to the fetus at doses nontoxic to the mother. Contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother.

Reproductive Toxicity

In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

Genetic Toxicology

Genetic toxicity studies on tested components were predominantly negative. Contains component(s) which were negative in some animal genetic toxicity studies and positive in others.

12. Ecological Information

ENVIRONMENTAL FATE

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

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

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

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

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

Persistence and Degradability

1,1,1,2-Tetrafluoroethane (HFC-134a) has a stratospheric ozone depletion potential (ODP) of zero, relative to CFC 12 (ODP=1). 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
6.20E-15 cm3/s	1,700 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
4 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.47 mg/mg

Data for Component: Glycerol propylene oxide polymer

Movement & Partitioning

Based on information for a similar material: Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).

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Persistence and Degradability

For this family of materials: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Data for Component: Sucrose , propylene oxide polymer

Movement & Partitioning

No bioconcentration is expected because of the relatively high water solubility.

Persistence and Degradability

Based on information for a similar material: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

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-05 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 cm ³ /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: 1,1,1,3,3 - Pentafluoropropane

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is medium (Koc between 150 and 500).

Henry's Law Constant (H): 6.89E-02 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): 1.35 Measured

Partition coefficient, soil organic carbon/water (Koc): 280 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

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Rate Constant	Atmospheric Half-life	Method
2.97E-14 cm ³ /s	360 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
8 %	28 d	OECD 301D Test

Theoretical Oxygen Demand: 0.60 mg/mg

Data for Component: Triethyl phosphate

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). 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): 3.60E-08 atm*m³/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 0.80 Measured

Partition coefficient, soil organic carbon/water (Koc): 48 Estimated.

Persistence and Degradability

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD₂₀ or BOD₂₈/ThOD < 2.5%).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
5.794E-11 cm ³ /s	0.18 d	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
0 %			

Theoretical Oxygen Demand: 1.58 mg/mg

Data for Component: Ethylene glycol

Movement & Partitioning

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). 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): 8.05E-09 atm*m³/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): -1.36 Measured

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

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
2.1 %	98 %	< 0.01 %	< 0.01 %	< 0.01 %

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

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Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.32E-12 cm ³ /s	15 h	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
> 94 %	28 d	OECD 301F Test
90 %	1 d	OECD 302B Test

Theoretical Oxygen Demand: 1.29 mg/mg

ECOTOXICITY

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

Data for Component: Glycerol propylene oxide polymer

For this family of materials: 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).

Data for Component: Sucrose , propylene oxide polymer

Based on information for a similar material: 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).

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 *Pseudokirchneriella subcapitata* (formerly known as *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: 1,1,1,3,3 - Pentafluoropropane

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).

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Fish Acute & Prolonged Toxicity

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

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, static, 48 h, immobilization: > 100 mg/l

Data for Component: Triethyl phosphate

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

Fish Acute & Prolonged Toxicity

LC50, Japanese medaka (*Oryzias latipes*), static, 48 h: > 500 mg/l

Data for Component: Ethylene glycol

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: 18,000 - 46,000 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, static, 48 h: 46,300 - 51,100 mg/l

Aquatic Plant Toxicity

EC50, green alga *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*), biomass growth inhibition, 96 h: 9,500 - 13,000 mg/l

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, respiration inhibition, 30 min: 225 mg/l

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: Recycler. Reclaimer. Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section 10 Regulatory Information, MSDS Section 15

14. Transport Information

DOT Non-Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Product: FROTH-PAK(TM) Sealant 200HFC Kit

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Hazard Class: 2.2 ID Number: UN1956

DOT Bulk

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Hazard Class: 2.2 ID Number: UN1956

IMDG

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

Hazard Class: 2.2 ID Number: UN1956

EMS Number: F-C,S-V

ICAO/IATA

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

Technical Name: Fluorinated Hydrocarbons, Nitrogen

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

Passenger Packing Instruction: 200

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	No
Fire Hazard	No
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

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

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

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

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)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
1,4-Dioxane	123-91-1	<= 0.016 %

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

Revision

Identification Number: 1042556 / 1001 / Issue Date 03/09/2010 / Version: 1.0

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.

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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.

Material Safety Data Sheet

NFPA 	HMIS <table border="1"><tr><td>Health Hazard</td><td>2*</td></tr><tr><td>Fire Hazard</td><td>4</td></tr><tr><td>Reactivity</td><td>1</td></tr></table>	Health Hazard	2*	Fire Hazard	4	Reactivity	1	PPE 	Transport Symbol 
Health Hazard	2*								
Fire Hazard	4								
Reactivity	1								

Issuing Date 27-Feb-2007

Revision Date 20-Aug-2012

Revision Number 4

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Touch 'n Seal® Gun Foam II Polyurethane Foam Sealant
Touch 'n Foam® Professional All-Purpose Foam Sealant

Recommended Use Insulation

Supplier Address Convenience Products, Division of Clayton Corp.
866 Horan Drive
Fenton, MO 63026-2416 USA
TEL: (636) 349-5333

Emergency Telephone Number Chemtel 1-800-255-3924
(813) 248-0585 outside US

2. HAZARDS IDENTIFICATION

WARNING!

Emergency Overview

Flammable gas. May cause flash fire.
Contents under pressure. Avoid temperatures above (120°F)
Irritating to eyes, respiratory system and skin.
May cause an allergic skin or respiratory reaction.
Vapor reduces oxygen available for breathing. Lower oxygen levels may cause anesthetic effects.
May cause drowsiness and dizziness.
Keep upwind of spill. Stay out of low areas.

Appearance Orange

Physical State Liquid Aerosol

Odor Faint hydrocarbon

Potential Health Effects

Principle Routes of Exposure

Inhalation, Skin contact, Eye contact.

Acute Toxicity

Eyes
Skin

Irritating to eyes. May cause slight temporary corneal injury due to adhesive character.
Prolonged skin contact may cause moderate skin irritation with local redness. May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Will bond to skin causing irritation upon removal.

Skin Absorption

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

Inhalation

Excessive exposure may cause irritation to upper respiratory tract. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Inhalation of vapors in high concentration may cause shortness of breath (lung edema).

Respiratory Sensitization:

May cause allergy or asthma symptoms or breathing difficulties if inhaled. 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.

Ingestion	May be harmful if swallowed. May cause additional affects as listed under "Inhalation". Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Product may cure in the gastrointestinal tract and form an obstruction. May cause adverse cardiac effects, blood disturbances, and metabolic acidosis.
Chronic Effects	Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI / Polymeric MDI aerosols. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Chronic hydrocarbon abuse has been associated with irregular heart rhythms and potential cardiac arrest. Repeated or prolonged contact causes sensitization, asthma and eczemas.
Birth / Developmental Effects:	In laboratory animals, MDI/Polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses that were toxic to the mother.
Aggravated Medical Conditions	Allergies. Skin disorders. Respiratory disorders. Central nervous system. Preexisting eye disorders. Kidney disorders. Liver disorders.
Interactions with Other Chemicals	Irritants. Sensitizers. Epoxies. Use of alcoholic beverages may enhance toxic effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %
Flame Retardant	Proprietary	5-10
Polymethylene polyphenylene isocyanate	9016-87-9	10-30
Methylene bisphenyl isocyanate (MDI)	101-68-8	10-30
Polyol blend	Proprietary	10-30
Isobutane	75-28-5	5-10
Methylenediphenyl diisocyanate	26447-40-5	1-5
Propane	74-98-6	1-5
Dimethyl ether	115-10-6	5-10

4. FIRST AID MEASURES

General Advice	If emergency warrants call 911 or emergency medical service. Remove and wash soiled clothing before reuse.
Eye Contact	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Obtain medical attention, preferably from an ophthalmologist.
Skin Contact	Remove wet material from skin immediately with corn oil or nail polish that contains acetone. If irritation symptoms persist, call a physician. Remove contaminated clothing; wash before reuse. Foam will stick to skin; studies demonstrate that cleaning very soon after exposure is most effective. If foam dries on skin, apply generous amounts of petroleum jelly or lanolin, put on plastic gloves and wait 1 hour. With a clean cloth, firmly wipe off petroleum jelly and repeat process if necessary. Do not attempt to remove dried foam with solvents.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
Ingestion	Call a physician or Poison Control Center immediately. May produce an allergic reaction. Do not induce vomiting unless directed to do so by medical personnel. Drink plenty of water. Never give anything by mouth to an unconscious person.

Notes to Physician Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. May cause respiratory sensitization or asthma-like symptoms. Respiratory symptoms, including pulmonary edema, may be delayed. Exposure may increase "myocardial irritability". If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Protection of First-Aiders Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Flammable Properties	Aerosol cans exposed to fire can rupture and spread fire to other areas. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.
Flash Point	-104°C / -155°F (based on propellant.)
Suitable Extinguishing Media	Isolate fire and deny unnecessary entry. Use an extinguishing agent suitable for type of fire. Dry chemical, CO2, water spray, fog or regular foam. Stay upwind. Keep out of low areas where gas fumes can accumulate. Fire damaged cylinders should be handled with extreme caution and only by authorized personnel.
Explosion Data	
Sensitivity to mechanical impact	None
Sensitivity to static discharge	Yes.

Specific Hazards Arising from the Chemical

Propellant is flammable and will burn. Eliminate ignition sources. Ruptured cylinders may rocket. Chemicals other than propellant may burn but none ignite readily. Flash back possible over considerable distance. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes.

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus and protective suit.

NFPA	Health Hazard 2	Flammability 4	Stability 1	Physical and Chemical Hazards -
HMIS	Health Hazard 2*	Flammability 4	Stability 1	Personal Precautions -B

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Do not touch or walk through spilled material. Use appropriate safety equipment. Evacuate area. Keep personnel out of low areas and confined or poorly ventilated areas. Keep upwind of spill. Ensure adequate ventilation. Remove all sources of ignition. No smoking in area. Only trained and properly protected personnel must be involved in clean-up operations.
Methods for Containment	If possible, turn leaking containers so that gas escapes rather than liquid. Allow substance to evaporate. Contain spilled material if possible without risk. Absorb with materials such as: Sawdust. Dirt. Vermiculite. Collect in suitable and properly labeled open containers. Do not place in sealed containers. Curing foam gives off CO2. Wash what is left of the spill site with large quantities of water.
Methods for Cleaning Up	Attempt to neutralize the spilled material 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 formulation is used, use good ventilation to prevent vapor exposure. Sweep up and shovel into suitable containers for disposal.
Other Information	Ventilate the area. Curing foam gives off CO2. Do not put curing foam in a sealed drum.

7. HANDLING AND STORAGE

Handling Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Ensure adequate ventilation. Take necessary action to avoid static electricity discharge (which might cause ignition of organic propellant vapors). Keep away from open flames, hot surfaces and sources of ignition. Do not Smoke. Avoid breathing vapors or mists. Contents under pressure. Do not puncture or incinerate cans. 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 stick pin or any other sharp object into opening on top of can.

Storage Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers. Keep in an area equipped with sprinklers. Keep out of the reach of children. Ideal storage temperature is 16-32 °C / 60 – 90 °F. Storage above 32 °C / 90 °F will reduce its shelf-life. Never keep at temperatures above 48.8°C / 120°F.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Methylene bisphenyl isocyanate (MDI)	TWA: 0.005 ppm	Ceiling: 0.02 ppm Ceiling: 0.2 mg/m ³	75 mg/m ³
Isobutane	TWA: 1000 ppm	N/A	N/A
Propane	TWA: 2,500 ppm STEL 1,000ppm, 3,500 mg/m ³	8Hr TWA: 1000 ppm 1,800.0 mg/m ³	2100 ppm

NIOSH IDLH: Immediately Dangerous to Life or Health

Engineering Measures Showers
 Eyewash stations
 Ventilation systems

Personal Protective Equipment Eye/Face Protection

Safety glasses with side-shields.

Skin and Body protection

Impervious gloves. Lightweight protective clothing.

Respiratory Protection

Atmospheric levels of PMDI should be maintained below the exposure guidelines. If exposure limits are exceeded or irritation is experienced, use a NIOSH/MSHA approved air-purifying respirator equipped with an organic vapor absorbent and a particle filter. For situations where the atmospheric levels exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplied respirator. Respiratory protection must be provided in accordance with current local regulations.

Hygiene Measures

When using, do not eat, drink or smoke. Maintain regular cleaning of equipment, work area and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Orange	Odor	Faint hydrocarbon
Odor Threshold	No information available	Physical State	Liquid Aerosol
pH	No information available		
Flash Point	-104°C / -155°F (based on propellant.)	Autoignition Temperature	Not applicable
Decomposition temperature	No data available	Boiling Point/Range	-42°C / -44°F
Melting Point/Range	No data available	Viscosity	No information available
Flammability Limits in Air	No data available	Explosion Limits	No data available
Specific Gravity	1.05	Water Solubility	Not Compatible
Solubility	Compatible.	Evaporation Rate	No data available
Vapor Pressure	No data available	Vapor Density	No data available
		VOC	1.29 (lbs/gal) 155 (g/l)

10. STABILITY AND REACTIVITY

Stability	Stable under recommended storage conditions
Conditions to Avoid	Keep away from open flames, hot surfaces and sources of ignition. Temperatures above 48.8 °C / 120 °F. Exposure to elevated temperatures can cause product to decompose.
Incompatible Products	Water. Alcohols. Strong bases. Strong oxidizing agents. Finely powdered metals.
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO ₂), Nitrogen oxides (NO _x), Hydrogen cyanide.
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

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.

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.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Flame Retardant	>2000 mg/kg (Rat)	>2000 mg/kg (Rat) 23700 mg/kg (Rabbit)	>5.22 mg/L (Rat) 4 h
Polymethylene polyphenylene isocyanate	49 g/kg (Rat)	9400 mg/kg (Rabbit)	490 mg/m ³ (Rat) 4 h
Methylene bisphenyl isocyanate (MDI)	9200 mg/kg (Rat)	5000 mg/kg (Rat)	
Polyol blend	64 mL/kg (Rat)	20 mL/kg (Rabbit)	
Isobutane			658 mg/L (Rat) 4 h

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methylenediphenyl diisocyanate		6200 mg/kg (Rabbit)	0.369 mg/L (Rat) 4 h
Propane		658 mg/kg (Rat)	
Dimethyl ether			308.5 g/ m ³ (Rat) 4 h

Chronic Toxicity Repeated or prolonged exposure may cause central nervous system damage. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols. Intentional misuse by deliberately concentrating and inhaling contents may be harmful or fatal. Chronic hydrocarbon abuse has been associated with irregular heart rhythms and potential cardiac arrest. Repeated or prolonged contact causes sensitization, asthma and eczemas.

Carcinogenicity There are no known carcinogenic chemicals in this product.

Mutagenicity Contains no known mutagenetic chemicals.

Reproductive Toxicity This product does not contain any known or suspected reproductive hazards

Target Organ Effects Contains component(s) that have been reported to cause effects on the following organs in animals: Kidney, Liver, Bone marrow.

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Fate

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

Persistence and Degradability: In the aquatic and terrestrial environment, PMDI reacts with water forming predominantly insoluble polyureas that 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 effects:

Chemical Name	Toxicity to Algae	Toxicity to Fish	Microtox	Daphnia Magna (Water Flea)
Flame Retardant	EC50 4.6 mg/L 72			LC50 3.8 - 5.5 mg/L 48 h
Methylenediphenyl diisocyanate	EC50 = 3230 mg/L 96 h			EC50 > 1000 mg/L 24 h
Dimethyl ether		LC50 (goldfish) 3677 mg/L, 96 h		LC50 1852 mg/L, 96 h

Chemical Name	Log Pow
Isobutane	2.88
Propane	2.3
Dimethyl ether	-0.18

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Should not be released into the environment. Dispose of in accordance with local regulations. Allow foam to cure before disposal.

Contaminated Packaging Dispose of in accordance with local regulations.

US EPA Waste Number D001

14. TRANSPORT INFORMATION

DOT

UN-No UN1950
Proper Shipping Name UN1950, Aerosols, flammable, 2.1, LTD QTY
Hazard Class 2.1
ERG Code Guide 127

TDG

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols, 2.1

MEX

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols, 2.1

ICAO

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
Description UN1950, Aerosols

IATA

UN-No UN1950
Proper Shipping Name Aerosols, flammable
Hazard Class 2.1
ERG Code 10L
Description UN1950, Aerosols, flammable, 2.1, LTD QTY

IMDG/IMO

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2.1
EmS No. F-D, S-U
Description UN1950, Aerosols, Flammable, 2.1, LTD QTY

RID

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
Description UN1950, Aerosols, 2, RID
ADR/RID-Labels 2

ADR

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
ADR/RID-Labels 2

ADN

UN-No UN1950
Proper Shipping Name Aerosols
Hazard Class 2
Classification Code 5A
Special Provisions 63, 190, 191, 277, 913
Description UN1950, Aerosols, 2
Hazard Labels 2
Limited Quantity See SP277

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
CHINA	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

U.S. Federal Regulations

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

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals that are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values
Polymethylene polyphenylene isocyanate	9016-87-9	10-30	1.0
Methylene bisphenyl isocyanate (MDI)	101-68-8	10-30	1.0
Methylenediphenyl diisocyanate	26447-40-5	1-5	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	Yes
Reactive Hazard	No

Clean Water Act This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122)
CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Methylene bisphenyl isocyanate (MDI)	5000 lb	

U.S. State Regulations

California Proposition 65

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.

U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Dimethyl ether	X	X	X		X
Propane	X	X	X		X
Isobutane	X	X	X		
Methylene bisphenyl isocyanate (MDI)	X	X	X	X	X

International Regulations

Mexico - Grade

Serious risk, Grade 3

The exposure limits values for 101-68-8 are listed under two synonyms:

Diphenylmethane diisocyanate - 0.02 ppm TWA; 0.2 mg/m³ TWA

Methylene bisphenyl isocyanate - 0.005 ppm TWA; 0.051 mg/m³ TWA

Chemical Name	Carcinogen Status	Exposure Limits
Methylene bisphenyl isocyanate (MDI)		Mexico: TWA= 0.2 mg/m ³ Mexico: TWA= 0.02 ppm
Diphenylmethane diisocyanate		Mexico: TWA= 0.005 ppm Mexico: TWA= 0.051 mg/m ³

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

- A Compressed gases
- B5 Flammable aerosol
- D2B Toxic material



Chemical Name	NPRI
Methylene bisphenyl isocyanate (MDI)	X

Legend:

NPRI - National Pollutant Release Inventory
WHMIS – Workplace Hazardous Materials Information System
TSCA – Toxic Substance Control Act
DSL – Domestic Substance List
EINECS – European Inventory of Existing Commercial Chemical Substances
ENCS – Japan, Existing and New Chemical Substances
KECL- Korean Existing Chemical List
PICS – Philippine Inventory of Chemicals and Chemical Substances
AICS – Australian Inventory of Chemical Substances
TDG – Transportation of Dangerous Goods Act
ICAO – International Civil Aviation Organization
IATA – International Maritime Dangerous Goods Code
IMDG – International Maritime Dangerous Goods Code

16. OTHER INFORMATION

Issuing Date 27-Feb-2007
Revision Date 20-Aug-2012
Revision Note Revised DOT section

Disclaimer

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS



TECHNICAL BULLETIN

STRUCTURAL BOARD ASSOCIATION

Representing the OSB Industry

25 Valleywood Drive, Unit 27, Markham, Ontario, Canada L3R 5L9

Tel: 905-475-1100 • Fax: 905-475-1101 • E-mail: info@osbguide.com • website: http://www.osbguide.com

GENERIC ORIENTED STRAND BOARD MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

Product Name: Oriented Strand Board

Synonyms: OSB, Waferboard, Rim Board, Web Stock, Proprietary Brand Names

Note: Proprietary products may have slightly different ingredients or characteristics. Please check with manufacturer.

HAZARDOUS INGREDIENTS

Principal Hazardous Component (Common Name or Chemical)	Quantity (Percent)	Unit	ACGIH TLV		OSHA PEL ¹	
			TWA	STEL	TWA	STEL
Wood	85 - 97					
Softwood or Hardwood Total Dust		(mg/m ³)			15 ²	10 ³
Wood Dust - Not Preservative Treated:						
Inhalable - Western Red Cedar		(mg/m ³)	0.5	none		
Inhalable - All Other Species		(mg/m ³)	1	none		
Resin Solids:						
- Phenol Formaldehyde ⁴	0 - 15	ppm	0.3 ⁵	none	0.75	2
- Polymeric Diphenylmethane Diisocyanate ⁶	0 - 15	ppm	none	none	none	none
Paraffin Wax	0 - 2	(mg/m ³)	2	none	2	none

- Notes:
1. Values for State PEL (or Province OEL) may be more restrictive.
 2. Respirable fraction is limited to 5 mg/m³.
 3. Recommended exposure limits based on 1989 OSHA PELs: TWA 5 mg/m³ and STEL 10 mg/m³ for all softwoods and hardwoods, except western red cedar; TWA 2.5 mg/m³ for western red cedar.
 4. Product contains less than 0.05% free formaldehyde (CAS RN 50-00-0). Phenol formaldehyde resin is used in the surface material and/or centre material.
 5. Ceiling value.
 6. This ingredient is the polymerized form of MDI binder (CAS RN 101-68-8). There are no detectable MDI monomers in the product as purchased. MDI binder is generally used in the centre material only.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling point (degrees Centigrade)	n/a
Specific gravity (water = 1.0)	0.5 - 0.7
Percent volatile (by volume)	0
Evaporation rate	n/a
Vapour pressure (mm of Hg)	n/a
Vapour density	n/a
Solubility in Water (% by weight)	< 0.1%

Appearance and Odour - brown panel consisting of a ligno-cellulosic matrix of interlocking wood fibres with slight aromatic odour (stronger when wet). The wood component may consist of the following species: alder, aspen, beech, birch, cottonwood, eastern red cedar, fir, gum, hemlock, hickory, maple, oak, pecan, pine, poplar, spruce, yellow cypress, walnut, and/or western red cedar.

FIRE AND EXPLOSION DATA

Flashpoint	n/a
Flammable Limits	Lower n/a Upper n/a
Fire Extinguishing Media	Water, CO ₂ , sand
Auto Ignition Temperature	Variable, typically 400-500 °F (200-260 °C)
NFPA Rating (scale 0-4)	Health =1; Fire=1; Reactivity=0

Normal Fire-Fighting Procedures Equipment:

Determined by surrounding fire. Use a water spray to wet down panels and any dust to prevent ignition. Remove burned material to open area after fire is extinguished.

Usual Fire or Explosion Hazard: Fine panel dust in an airborne concentration greater than 40 g/m³ of air may explode if the dust cloud contacts a source of ignition.

REACTIVITY DATA

It is a stable product, however excess moisture conditions and open flame should be avoided. It is incompatible with oxidizing agents and drying oil. Good housekeeping procedures and routine disposal of panel dust is suggested. When burned it releases carbon monoxide, polycyclic aromatic hydrocarbons, carbon dioxide, aldehydes and other toxic fumes and gases. Hazardous polymerization will not occur.

HEALTH HAZARDS

Sign and Symptoms of Exposure

1. **Acute Overexposure:** Panel dust may be a mechanical irritant to eyes. Excessive concentration may cause deposit in nasal passages resulting in rhinorrhea, dry cough, wheezing, sinusitis.

2. **Chronic Overexposure:** Wood dust, depending on species, may cause dermatitis on prolonged, repetitive contact; may cause respiratory sensitisation and/or irritation. Prolonged exposure to wood dust has been reported by some observers to be associated with nasal cancer. IARC classifies wood dust as a Group 1 - carcinogen to humans. This classification is based on IARC's evaluation of increased risk in the occurrence of adeno-carcinomas of the nasal cavities and paranasal sinuses associated with the exposure to wood dust. IARC did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon, or rectum with exposure to wood dust.

Note: These products are manufactured using a phenol-formaldehyde thermoset resin and/or polyurethane binder. Maximum indoor formaldehyde levels associated with freshly manufactured panels are similar to outdoor background levels in urban areas (less than 0.1 ppm) and levels decrease through time as the panels age.

Medical Conditions Generally Aggravated by Exposure: Individuals with predisposing respiratory disease - asthma, chronic bronchitis - may have difficulty working around airborne particulates including dust.

Product Listed as Carcinogen - Formaldehyde

NTP Yes - Reasonably anticipated to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No - Regulated formaldehyde gas, potential carcinogen for exposures exceeding 0.5 ppm

Formaldehyde has been classified as a known carcinogen or probable carcinogen by NTP, IARC, and OSHA. A working group of IARC has determined that there is sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans, a rare form of cancer in developed countries.

Product Listed as Carcinogen - Wood Dust

NTP Yes - Known to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No

SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved dust respirator recommended under dusty conditions.

Ventilation: Local exhaust- Panel dust should be collected at source, so that exposure limits are met.

Protective Gloves: Leather, cloth or canvas recommended to minimize slivers or irritation when handling.

Eye Protection: Safety glasses or goggles recommended when machining.

Other Protective Clothing or Equipment: Follow good hygiene and housekeeping practices. Clean up areas where dust settles to avoid excessive accumulation of this combustible material. Minimize blowdown or other practices generating high dust concentrations.

EMERGENCY AND FIRST AID PROCEDURES

1. **Inhalation:** Remove to fresh air. If persistent irritation, severe coughing, breathing difficulties or rash occur, seek medical advice. (Primary route of exposure is inhalation).

2. **Eyes:** Panel dust may mechanically irritate the eye, resulting in redness or watering. Flush with water to remove dust particles. If irritation persists, seek medical attention.

3. **Skin:** Various species of wood dust can elicit allergic contact dermatitis in sensitized individuals after repetitive contact. If a rash, or persistent irritation or dermatitis occurs, seek medical advice before working where panel dust is present.

4. **Ingestion:** n/a

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage:

No special handling precautions are required. Panels are combustible. Keep in cool, dry place away from open flame and other sources of ignition.

Other Precautions: If this product is used in a process which generates dust levels in excess of the allowable exposure limit(s) for wood dust, a NIOSH approved dust respirator and goggles should be worn.

Due to the explosive potential of wood dust when suspended in air, precautions should be taken to prevent sparks or other ignition sources in ventilation systems. Use of totally enclosed motors is recommended (or may be warranted) if process generates excessive levels of wood dust.

Steps to be taken in Case Material is Released or

Spilled: Not applicable for product in purchased form. Panel dust may be vacuumed or shovelled for recovery or disposal. Avoid dusting conditions. Provide good ventilation where dusting is possible. Use NIOSH approved dust respirator and goggles where ventilation is not possible.

Waste Disposal Methods: If disposed or discarded in its purchased form, incineration is preferable. Dry land disposal may be acceptable. It is however the user's responsibility to determine at time of disposal whether the product meets federal, state, provincial or local regulations.

GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
C	degree Centigrade
CAS RN	Chemical Abstracts Service Registry Number (American Chemical Society)
F	degree Fahrenheit
IARC	International Agency for Research on Cancer
mg/m ³	milligrams per cubic meter of air
n/a	not applicable
NFPA	National Fire Protection Association (US)
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OEL	occupational exposure limit
OSHA	Occupational Safety and Health Administration (US)
PEL	permissible exposure level
ppm	parts per million in air
STEL	short term exposure limit (15 minutes)
TLV	threshold limit value
TWA	8 hour time weighted average

Important: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. SBA makes no warranty, express or implied, concerning the accuracy or completeness of the information and data herein and will not be liable for claims relating to any party's use of a reliance on the information and data contained herein. It is expected by SBA that the user of this information will confirm its accuracy and completeness with the supplier and/or manufacturer of the oriented strand board or waferboard product being purchased and/or used.

MATERIAL SAFETY DATA SHEET

MSDS Name: QB-300 MULTIPURPOSE CONSTRUCTION ADHESIVE
MSDS Number: 30011
Version Number 3
Revision Date: SEP-27-2005
Page Number: 1

SECTION I - PRODUCT AND COMPANY INFORMATION

Product Name: QB-300 MULTIPURPOSE CONSTRUCTION
ADHESIVE
HMIS Hazard Rating: Health: 1 Fire: 3 Reactivity: 0 PPE: B

Company Identification: HENKEL CONSUMER ADHESIVES
7405 PRODUCTION DRIVE
MENTOR OH 44060

Contact (24 hour): Customer Affairs (800)321-0253
Information phone/Fax: (440) 255-8900 / (440) 974-8358
CHEMTREC Emergency (24 hour): (703) 527-3887 (International)
(800) 424-9300
in Canada CANUTEC 613-996-6666

Product Class ADHESIVE
Trade Name PRO-SERIES
Product Code 30011,30029

SECTION II - INGREDIENT AND HAZARD INFORMATION

Hazardous Ingredient Name	CAS Number	Percent	TSCA
Light Hydrotreated Naphtha	64742-49-0	15 - 25	Y

Ingredient Notes:
Remaining ingredients are not considered OSHA hazardous.

SECTION III - PHYSICAL AND CHEMICAL PROPERTIES

Form: Tan, non-sag mastic
Solubility (in water): insol.
pH Value, +/- .3: Not Applicable
Boiling Range: 135.°F - 165.°F (57.22°C - 73.89°C)
Vapor Pressure (mmHg): over 99.@ 68.°F (20.°C)
Evaporation Rate: 4.4 times Faster than n-Butyl Acetate

Vapor Density: Heavier than air

% Volatile, Weight 20.%
% Volatile, Volume 35.%
Specific Gravity: 1.36904
VOC (less H2O or exempt) 280 g/l (20%)

MATERIAL SAFETY DATA SHEET

MSDS Name: QB-300 MULTIPURPOSE CONSTRUCTION ADHESIVE
MSDS Number: 30011
Version Number: 3
Revision Date: SEP-27-2005
Page Number: 2

NOTE:

*BOIL RANGE, EVAP RATE, VAPOR DENSITY AND PRESSURE FOR SOLVENT ONLY!

SECTION IV - FIRE FIGHTING MEASURES (Flash,UEL,LEL for solvent only)

Flammability Class: IB
Flash Range: approx. 0.F - 5.F (-17.78.C - -15.C)
Tag Closed Cup
Explosive Range (LEL/UEL): 1.% 6.7%

EXTINGUISHING MEDIA:

Carbon Dioxide---Dry Chemical---Foam
Use water fog to cool material in vicinity of fire.

SPECIAL FIRE-FIGHTING PROCEDURES:

Use self-contained breathing apparatus with full facepiece
operated in pressure demand with full protective equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Any closed container may rupture when exposed to extreme heat.
Solvent vapors are heavier than air and travel along the ground.
Vapors given off are flammable and may be ignited in air explosively.

SECTION V - HEALTH HAZARD DATA

ROUTES OF ENTRY:

ENTRY THROUGH
Inhalation? YES | Skin? YES | Ingestion? YES

Contains N-Hexane (110-54-3) in trace quantities, which can
cause peripheral neuropathy & nervous system damage.

CARCINOGENICITY...

NTP? N/E | IARC Monographs? N/E | OSHA? NO

EFFECTS OF OVEREXPOSURE

Eyes: Can cause irritation, redness, tearing and blurred vision.
Skin: Prolonged or repeated contact can cause moderate
irritation, drying of the skin, and dermatitis.
Inhalation: Excessive inhalation of vapors can cause respiratory
irritation, headache, drowsiness and fatigue. High
concentrations of vapors are anesthetic and may cause
central nervous system effects such as dizziness.
Ingestion: Can cause gastrointestinal irritation, nausea,
vomiting and diarrhea.

FIRST AID MEASURES

Eyes: Flush eyes gently with water for at least 15 minutes
lifting eyelids occasionally; get prompt medical attention

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Skin: Wash thoroughly with soap and water; apply a mild skin cream.
Remove contaminated clothing.
Inhalation: Move affected person to fresh air; if breathing is
difficult, administer oxygen; if breathing has stopped,
give artificial respiration. Get medical attention.
Ingestion: DO NOT INDUCE VOMITING! Get immediate medical attention.

CHRONIC HAZARDS

NOTICE: Reports have associated repeated and prolonged
occupational overexposure to solvents with permanent brain,
nervous system, liver or kidney damage or may cause cardiac
arrhythmia. INTENTIONAL misuse of this product by
deliberately inhaling its vapors may be harmful or fatal.

SECTION VI - STABILITY AND REACTIVITY

Stability: This product is stable
Hazardous Polymerization: Hazardous polymerization will not occur

INCOMPATIBILITY:

Keep away from strong oxidizing agents.

CONDITIONS TO AVOID:

Keep away from heat, spark, open flames and any ignition source.

HAZARDOUS DECOMPOSITION PRODUCTS:

Will produce fumes and smoke containing carbon monoxide and
dioxide under fire conditions.

SECTION VII - ACCIDENTAL RELEASE AND DISPOSAL MEASURES:

STEPS TO BE TAKEN IN CASE OF SPILL:

Eliminate all ignition sources. Ventilate confined areas.
(Open windows and doors). Wear appropriate protective clothing.
Cover with absorbent. Scoop into sealable safety container.

WASTE DISPOSAL METHOD:

Dispose of following local, state, and federal regulations.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Table with 5 columns: ACGIH TLV, ACGIH TLV-C, ACGIH STEL, OSHA STEL, OSHA PEL. Row 1: Light Hydrotreated Naphtha, 400.00 PPM, N/est, N/est, N/est, 400.00 PPM.

RESPIRATORY PROTECTION:

If TLV of the product is exceeded, a NIOSH/MSHA jointly approved
air supply respirator is advised in the absence of proper

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ventilation. OSHA regulations also permit the use of other types of NIOSH/MSHA respirators under specified conditions. (See your safety equipment supplier for more information)

VENTILATION:

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV. Ventilate during application and curing of this product.

PROTECTIVE CLOTHING:

Rubber gloves should be worn where skin contact is likely. Wear impervious clothing and shoes.

EYE PROTECTION:

Chemical goggles or safety glasses should be worn.

HANDLING AND STORAGE PRECAUTIONS:

Keep away from heat, spark and flame.
Keep out of reach of children.
Keep container closed while not in use.
Do not cut or burn recepticals that have contained a solvent based product. Do not reuse this container.
Use only in a well ventilated area.

N/A=NOT APPLICABLE N/AV=NOT AVAILABLE N/E, N/est=NOT ESTABLISHED

SECTION IX - TRANSPORT INFORMATION: (not all sizes available)

GROUND TRANSPORT (DOT) - DOMESTIC

Units less than 5L (1.3 gallons liquid) i.e.10oz, 28oz, 1 gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM-D
DOT Label Required: ORM-D
Shipping Document: CONSUMER COMMODITY, ORM-D
ERG Code: 171

Units GREATER than 5L i.e. 5 gal. pail

Proper Shipping Name: ADHESIVE
Classification: CLASS 3
DOT Label Required: Flammable Liquid, UN1133, Class 3
Shipping Document: ADHESIVE,3,UN1133, PGIII,
for 50 gal. drum use PG II
ERG Code: 128

AIR TRANSPORT (DOT) - DOMESTIC

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM-D
DOT Label Required: ORM-D-AIR

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Shipping Document: Consumer Commodity, ORM-D
ERG Code: 171

Units GREATER than 5L i.e. 5 gal. pail
Proper Shipping Name: ADHESIVE
Classification: Class 3
DOT Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PG III,
for 50 gal. drum use PG II
ERG Code: 128

AIR TRANSPORT (IATA) - INTERNATIONAL

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1 gal.

Proper Shipping Name: CONSUMER COMMODITY
Classification: class 9
Label Required: ID8000
Shipping Document: Consumer Commodity,9, ID8000
ERG Code: 9L

Units GREATER than 5L i.e. 5 Gal. pail, 50 gal.drum
Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PGIII,
for 50 gal. drum use PG II
ERG Code: 3L

MARINE - OCEAN TRANSPORT (IMDG)

Units less than 5L (1.3 gallons liquid) i.e.10oz,28oz, 1 gal.

Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN1133, Class 3, Ltd. Qty.
(on Ocean container only, not required on cartons)
Shipping Document: ADHESIVE,3, UN1133, PG III, LTD.QTY.
EMS Code: F-E, S-D

Units GREATER than 5L i.e. 5 gal. pail, 50 gal drum
Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN 1133, Class 3
Shipping Document: ADHESIVE, 3, UN1133, PGIII,
for 50 gal. drum use PG II
EMS Code: F-E, S-D

SECTION X - REGULATORY INFORMATION:

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SARA Section 311/312 Hazard Categories met: Fire Hazard,
Immediate (Acute) and Delayed (Chronic) Health Hazards.

Chemical ingredients are listed on the TSCA inventory.

SARA Section 313 toxic chemicals: NONE above the de minimis
reporting thresholds.

California PROP.65 Chemicals: none known

DISCLAIMER:

The information contained herein is based on data available as of the date of preparation of this MSDS and which we believe to be reliable. However, no warranty is expressed or implied regarding the accuracy of the data. We shall not be responsible for the use of this information, or of any product, method, apparatus mentioned, and user must make his own investigation to determine the suitability of the information or products for his particular purpose, for the protection of the environment, and the health & safety of the users of this material.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW

DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs):

COMPANY CONTACT (business hours):

MSDS (Environment, Health, Safety) Internet Website

CHEMTREC (800)424-9300

Corporate Safety (732)750-6000

www.hess.com

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS *

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).



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Gasoline, All Grades

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Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION

EYES

Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.



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6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

*****USE ONLY AS A MOTOR FUEL*****

*****DO NOT SIPHON BY MOUTH*****

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.



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8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	Skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50	--	A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200	--	Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	20	--	A4	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

A translucent, straw-colored or light yellow liquid



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ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H ₂ O = 1):	0.70 - 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H ₂ O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitroresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg	Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating	Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative	

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.



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This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Gasoline
DOT HAZARD CLASS and PACKING GROUP: 3, PG II
DOT IDENTIFICATION NUMBER: UN 1203
DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

Table with 5 columns: ACUTE HEALTH, CHRONIC HEALTH, FIRE, SUDDEN RELEASE OF PRESSURE, REACTIVE. Values: X, X, X, --, --

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

Table with 2 columns: INGREDIENT NAME (CAS NUMBER), CONCENTRATION WT. PERCENT. Rows: Benzene (71-43-2) 0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline), Ethyl benzene (100-41-4) < 3



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n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

<u>NFPA® HAZARD RATING</u>	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
<u>HMIS® HAZARD RATING</u>	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal

* CHRONIC

SUPERSEDES MSDS DATED: 07/01/06

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
ANSI	American National Standards Institute (212)642-4900		[General Info: (800)467-4922]
API	American Petroleum Institute (202)682-8000	EPA	U.S. Environmental Protection Agency
		HMIS	Hazardous Materials Information System



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



1. IDENTIFICATION

Product Identifier Diesel Fuel

Synonyms: Diesel Fuel, Motor Vehicle Diesel Fuel, Dyed Diesel, * DieselOne®, * DieselOne® w/Platinum Plus DFX, Low Sulfur Diesel (LSD), Ultra Low Sulfur Diesel (ULSD)

Intended use of the product: Fuel

Contact: Global Companies LLC
Water Mill Center
800 South St.
Waltham, MA 02454-9161
www.globalp.com

Contact Information: EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300
COMPANY CONTACT (business hours): 800-542-0778

2. HAZARD IDENTIFICATION

According to OSHA 29 CFR 1910.1200 HCS

Classification of the Substance or Mixture

Classification (GHS-US):

Flam. Liquid	Category 3	H226
Skin Corrosion/Irritation	Category 2	H315
Aspiration Hazard	Category 1	H304
STOT SE	Category 3	H336
Carcinogenicity	Category 2	H350
Aquatic Chronic	Category 2	H411
Serious Eye Damage/ Irritation	Category 2B	H319

Labeling Elements



Signal Word (GHS-US):

Hazard Statements (GHS-US):

Danger

H226 – Flammable liquid and vapor.
H315 – Causes Skin irritation.
H304 – May be fatal if swallowed and enters airways.
H336 – May cause drowsiness or dizziness.
H350 – May cause cancer.
H411 – Toxic to aquatic life with long lasting effects.
H319 – May cause eye damage/irritation.

Precautionary Statements (GHS-US):

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 - Keep container tightly closed.
P240 – Ground/bond container and receiving equipment.



SAFETY DATA SHEET

Diesel Fuel

- P241 – Use explosion-proof electrical/ventilating/lighting equipment pursuant to applicable electrical code.
- P242 – Use only non-sparking tools.
- P243 – Take precautionary measures against static discharge.
- P261 – Avoid breathing dust/fume/gas/mist/vapors/spray.
- P264 – Wash skin thoroughly after handling.
- P271 – Use only outdoors or in a well-ventilated area.
- P273 – Avoid release to the environment.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P303+361+353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse with water/shower.
- P308+311 - If exposed or concerned: Get medical advice/attention.
- P301+310 - If swallowed: Immediately call a poison center/doctor/...
- P331 - Do NOT induce vomiting.
- P370+P378 – In case of fire use firefighting foam or other appropriate media for Class B fires to extinguish.
- P403+235 - Store in a well-ventilated place. Keep cool.
- P405 - Store locked up.
- P501 – Dispose of contents/container in accordance with local/regional/national/international regulation.

Other information:

NFPA 704
Health: 1
Fire: 2
Reactivity: 0



3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Composition Information

Mixture

Name	Product Identifier (CAS#)	% (w/w)	Classification
Diesel Fuel	68476-34-6	100	Flam Liq. 3, H226; Skin Irrit. 2, H315; Aspiration 1, H304; STOT SE 3, H336; Carc.2. H350; Aquatic chronic 2, H411
Naphthalene	91-20-3	<0.1	Carc. 2, H351; Acute Tox. 4, H302; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

Additional Formulation Information:

Diesel Fuel consists of C9+ hydrocarbons resulting from distillation of crude oil.

Low Sulfur Diesel Fuel typically contains less than 500 ppm of sulfur

Ultra Low Sulfur Diesel Fuel typically contains less than 15 ppm of sulfur



4. FIRST AID MEASURES

Route	Measures
Inhalation	Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.
Ingestion	Aspiration Hazard: DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Ingestion may cause gastrointestinal disturbances including irritation, nausea, vomiting, and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory failure, and death.
Eye Contact	In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention. In case of contact lenses, remove immediately.
Skin Contact	Remove contaminated clothing and shoes. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and of the area of the body burned.

Most Important Symptoms

Contact with eyes and face may cause irritation. Long-term exposure may cause dermatitis (itching, irritation, pain and swelling).

Inhalation may cause irritation and significant or long term exposure could cause respiratory insufficiency and pulmonary edema.

Ingestion may cause aspiration, gastrointestinal disturbance, and CNS effects.

Immediate Medical Attention and Special Treatment

For contact with skin or eyes, immediately wash or flush contaminated eyes with gently flowing water. If possible, irrigate each eye continuously with 0.9% saline (NS). If ingested, rinse mouth. Do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

If inhaled, administer oxygen or establish a patent airway if breathing is labored. Suction if necessary. Monitor closely, anticipate seizures. Consider orotracheal or nostracheal intubation of airway control if patient is unconscious or is in severe respiratory distress.

Discard any clothing or shoes contaminated as they may be flammable.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Foam, carbon dioxide, dry chemical are most suitable

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, firefighting foam, or Halon. Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other firefighting equipment.

LARGE FIRES: Foam, carbon dioxide, dry chemical. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Specific Hazards / Products of Combustion

Moderate fire hazard when exposed to heat or flame with a very low flash point. Product is flammable and easily ignited when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Combustion may produce smoke, carbon monoxide and other products of incomplete combustion.

Special Precautions and Protective Equipment for Firefighters

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water.



For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied firefighting foam.

Fighting Equipment/Instructions

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full face piece and protective clothing.

Refer to Section 9 for fire properties of this chemical including flash point, auto ignition temperature, and explosive limits.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPCC, SPILL CONTINGENCY or EMERGENCY PLAN.

Personal Precautions

Due to high vapor density, flammable / toxic vapors may be present in low lying areas, dikes, pits, drains, or trenches. Vapors may accumulate in low lying areas and reach ignitable concentrations. Ventilate the area. Use of non-sparking tools and intrinsically safe equipment is recommended. Potential for flammable atmosphere should be monitored using a combustible gas indicator positioned downwind of the spill area. Refer to Sections 2 and 7 for further hazard warnings and handling instructions.

Use appropriate personal protective equipment to prevent eye/skin contact and absorption. Use NIOSH approved respiratory protection, if warranted, to prevent exposures above permissible limits. Refer to Section 8. Contaminated clothing should not be near sources of ignition.

Emergency Measures

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Consider wind direction. Secure all ignition sources (flame, spark, hot work, hot metal, etc.) from area. Evaluate the direction of product travel, diking sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material. For large spills, isolate initial action distance downwind 1,000 ft. (300 m).

Environmental Precautions

Stop the spill to prevent environmental release if it can be done safely. Product is toxic to aquatic life. Take action to isolate environmental receptors including drains, storm sewers and natural water bodies. Keep on impervious surface if at all possible. Use water sparingly to prevent product from spreading. Foam and absorbents may be used to reduce / prevent airborne release.

Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Follow federal, state or local requirements for reporting environmental release where necessary. Refer to Section 15 for further information.

Containment and Clean-Up Methods

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of firefighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and cleanup crews must be properly trained and must utilize proper protective equipment. Refer to Section 8 for appropriate protective equipment.

7. HANDLING AND STORAGE

USE ONLY AS A FUEL.

DO NOT SIPHON BY MOUTH.

Handling Precautions

Handle as a flammable liquid. Keep away from heat, sparks, and open flame. No smoking. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer pursuant to NFPA 70 and API RP 2003 to



reduce the possibility of static-initiated fire or explosion. Follow precautions to prevent static initiated fire.

Use good personal hygiene practices. Use only with protective equipment specified in Section 8. Avoid repeated and/or prolonged skin exposure. Use only outdoors or in well ventilated areas. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves. Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API RP 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage

Large quantities of diesel fuel are stored in tanks or portable containers at an ambient storage temperature. Separate from incompatible chemicals (Refer to Section 10) by distance or secondary containment. Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers that are clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain flammable vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Storage tanks should have a venting system. If stored in small containers, the area should be well ventilated, away from ignition sources and protected from potential damage or vehicular traffic. Post "No Smoking" signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code" or applicable building code. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks in Flammable and Combustible Liquid Service" and API RP 2015 "Safe Entry and Cleaning of Petroleum Storage Tanks".

Incompatibles

Keep away from strong oxidizers, ignition sources and heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Component	CAS #	List	Value
Diesel Fuel	68476-34-6	ACGIH TLV-TWA	100 mg/m3*
Naphthalene	91-20-3	ACGIH TLV-TWA OSHA PEL ACGIH STEL	10 ppm 10 ppm 15 ppm

*Critical effects; Skin; A3; CNS impairment.

Engineering Controls

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Intrinsically safe equipment and non-sparking tools shall be used in circumstances where concentrations may exceed lower flammable limits. Grounding and bonding shall be used to prevent accumulation and discharge of static electricity. Emergency shower and eyewash should be provided in proximity to handling areas in the event of exposure to decontaminate.

Personal Protective Equipment

Exposure	Equipment
Eye / Face	Wear appropriate chemical protective glasses or goggles or face shields to prevent skin and eye contact especially caused from splashing.
Skin	Wear appropriate personal protective clothing to prevent skin contact. Gloves constructed of nitrile, neoprene or PVC are recommended when handling this material. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure.



Exposure	Equipment
Respiratory	<p>A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.</p> <p>Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.</p>
Thermal	<p>Product is stored at ambient temperature. No thermal protection is required except for emergency operations involving actual or potential for fire. Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.</p>

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value
Appearance	Clear or straw-colored liquid. May be dyed red for distribution.
Odor	Mild characteristic petroleum distillate odor.
Odor Threshold	<1 ppm
pH	Not available
Melting Point	-22 to -0.4 °F (-30 to -18 °C)
Boiling Point Range	320 to 690 °F (160 to 366 °C)
Flash Point	> 125.6 °F (52 °C) PMCC
Evaporation Rate	Slow, varies with conditions
Flammability	Flammable liquid
Flammable Limits	0.6 % - 6.5%
Vapor Pressure	0.009 psia @ 70 °F
Vapor Density	> 1 (air=1)
Specific Gravity	0.83-0.86 @ 60 °F (16 °C) (water=1)
Solubility	Insoluble in water; miscible with other petroleum solvents.
Partition Coefficient (N-octanol/water)	Log Kow range of 3.3 to >.6.0
Autoignition Temperature	494 °F (257 °C)
Decomposition Temperature	When heated it emits acrid smoke and irritating vapors.
Viscosity	>3 cSt
Percent Volatiles	100

10. STABILITY AND REACTIVITY

Stability

This is a stable material that is flammable liquid (OSHA/GHS hazard category 3). Stable during transport.

Reactivity

Material is not self-reacting. Flammable concentrations may be present in air. Compound can react with oxidizing materials.



Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

Incompatibility

Keep away from strong oxidizers such as nitric and sulfuric acids.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, static electricity, welding, smoking and other ignition sources.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Acute Toxicity (Inhalation LC50)

Diesel Fuel (68476-34-6)

LC50 Inhalation Rat >6 mg/l/4h

Acute Toxicity (Dermal LD50)

Diesel Fuel (68476-34-6)

LD50 Dermal Rabbit >5000 mg/kg

Acute Toxicity (Oral LD50)

Diesel Fuel (68476-34-6)

LD50 Oral Rabbit >5000 mg/kg

Skin Corrosion/Irritation: Prolonged and repeated contact may cause skin irritation leading to dermatitis. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: OSHA: NO, IARC: Group 3, NTP: NO, ACGIH: NOIC:A3, NIOSH: NO

IARC: Group 3 – Not classifiable as to their carcinogenicity to humans

ACGIH: A3 – Confirmed animal carcinogen with unknown relevance to humans.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

IARC classifies whole diesel fuel exhaust particulates (byproduct of combustion of this material) carcinogenic to humans (Group 1) and NIOSH regards diesel fuel exhaust particulate as a potential occupational carcinogen.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Specific Target Organ Toxicity (Single Exposure): Inhalation exposure may cause drowsiness or dizziness by inhalation exposure.

Aspiration Hazard: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Potential Health Effects: Vapor irritating to skin, eyes, nose, and throat. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

WARNING: The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of



combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

12. ECOLOGICAL INFORMATION

Toxicity:

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Data for Component: Diesel Fuel (68476-34-6)

Material is toxic to aquatic organisms based on an acute basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Material is a long-term aquatic hazard based on a chronic basis (LC50/EC50 >1 but ≤ 10 mg/L in the most sensitive species tested).

Persistence and Degradation: This material is not expected to be readily biodegradable.

Bioaccumulative Potential: Not available

Mobility in Soil: Not available

Other Adverse Effects: None known

Other Information: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options. May be considered a hazardous waste if disposed. Direct solid waste (landfill) or incineration at a solid waste facility is not permissible. Do not discharge to sanitary or storm sewer. Personnel handling waste containers should follow precautions provided in this document.

Shipping containers must be DOT authorized packages. Follow licensure and regulations for transport of hazardous material and hazardous waste as applicable.

14. TRANSPORT INFORMATION

US DOT

UN Identification Number	NA 1993 / UN 1202
Proper Shipping Name	Diesel Fuel
Hazard Class and Packing Group	3, PGIII
Shipping Label	Combustible liquid
Placard / Bulk Package	Combustible liquid, 1993
Emergency Response Guidebook Guide Number	128

IATA Information

UN Identification Number	UN 1202
Proper Shipping Name	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PGIII
ICAO Label	3
Packing Instructions Cargo	310
Max Quantity Per Package Cargo	220L
Packing Instructions Passenger	309Y
Max Quantity per Package	60L

ICAO

UN Identification Number	UN 1202
Shipping Name / Description	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PG III
IMDG Label	3



IMDG

UN Identification Number	UN 1202
Shipping Name / Description	Combustible-Liquid, N.O.S. (Fuel, Diesel)
Hazard Class and Packing Group	3, PGIII
IMDG Label	3
EmS Number	F-E-S-E
Marine Pollutant	Yes

15. REGULATORY INFORMATION

U.S. Federal, State, and Local Regulatory Information

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

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	No

Clean Water Act (Oil Spills)

Any spill or release of this product to "navigable waters" (Essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA Section 103 and SARA Section 304 (Release to the Environment)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts this material. This product does not contain any chemicals subject to the reporting requirements of CERCLA Section 103 or SARA 304.

SARA Section 313- Supplier Notification

This product does not contain any chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

EPA Notification (Oil Spills)

If there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

Pennsylvania Right to Know Hazardous Substance list:

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

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%

New Jersey Right to Know Hazardous Substance list:

The following product components are cited in the New Jersey Right to Know Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Diesel Fuel	68476-34-6	100%



California Proposition 65 WARNING: This product contains chemicals known to the State of California to cause Cancer or Reproductive Toxicity.

Component	CAS	Amount
Naphthalene	91-20-3	<0.1%

U.S. 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.

Canadian Regulatory Information (WHMIS)

Class B3 – Combustible Liquid
Class D2A – Materials causing other toxic effects. (Very Toxic)

16. OTHER INFORMATION

Version	4
Issue Date	May 20, 2016
Prior Issue Date	May 3, 2015

Description of Revisions

Revised to meet Globally Harmonized System for chemical hazard communication requirements pursuant to OSHA regulatory revisions 77 FR 17884, March 26, 2012.

Abbreviations

°F	Degrees Fahrenheit (temperature)	mL	Milliliter
<	Less than	mm ²	Square millimeters
=	Equal to	mmHg	Millimeters of mercury (pressure)
>	Greater than	N/A	Not applicable
AP	Approximately	N/D	Not determined
C	Centigrade (temperature)	ppm	Parts per million
kg	Kilogram	sec	Second
L	Liter	ug	Micrograms
mg	Milligrams		

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists	GHS	Global Harmonized System
AIHA	American Industrial Hygiene Association	HMIS	Hazardous Materials Information System
AL	Action Level	IARC	International Agency for Research On Cancer
ANSI	American National Standards Institute	IATA	International Air Transport Association
API	American Petroleum Institute	IMDG	International Maritime Dangerous Goods
CAS	Chemical Abstract Service	Koc	Soil Organic Carbon
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	LC50	Lethal concentration 50%
DOT	U.S. Department of Transportation	LD50	Lethal dose 50%
EC50	Ecological concentration 50%	MSHA	Mine Safety and Health Administration
EPA	U.S. Environmental Protection Agency	NFPA	National Fire Protection Association
ERPG	Emergency Response Planning Guideline	NIOSH	National Institute of Occupational Safety and Health
		NOIC	Notice of Intended Change



SAFETY DATA SHEET

Diesel Fuel

NTP	National Toxicology Program	STEL	Short Term Exposure Limit (generally 15 minutes)
OPA	Oil Pollution Act of 1990	TLV	Threshold Limit Value (ACGIH)
OSHA	U.S. Occupational Safety & Health Administration	TSCA	Toxic Substances Control Act
PEL	Permissible Exposure Limit (OSHA)	TWA	Time Weighted Average (8 hr.)
RCRA	Resource Conservation and Recovery Act Reauthorization Act of 1986 Title III	UN	United Nations
REL	Recommended Exposure Limit (NIOSH)	UNECE	United Nations Economic Commission for Europe
RVP	Reid Vapor Pressure	WEEL	Workplace Environmental Exposure Level (AIHA)
SARA	Superfund Amendments and	WHMIS	Canadian Workplace Hazardous Materials Information System
SCBA	Self Contained Breathing Apparatus		
SPCC	Spill Prevention, Control, and Countermeasures		

Disclaimer of Expressed and Implied Warranties

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** End of Safety Data Sheet **



SAFETY DATA SHEET

Ethanol 99,8%

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Date issued 26.11.2013

1.1. Product identifier

Product name Ethanol 99,8%
Chemical name Ethyl alcohol
Synonyms methyl carbinol
REACH Reg No. 01-2119457610-43-0000
CAS no. 64-17-5
EC no. 200-578-6
Index no. 603-002-00-5
Article no. 12110000

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/preparation For the preparation of paints and as a solvent. Disinfectant. Antiseptic. Antifreeze liquid. General purpose cleaner.

1.3. Details of the supplier of the safety data sheet

Company name Fred Holmberg & Co AB
Office address Geijersgatan 8
Postal address Box 60056
Postcode S-216 10
City Limhamn
Country Sweden
Tel +46 (0)40 15 79 20
Fax +46 (0)40 16 22 95
E-mail info@holmberg.se
Website <http://www.holmberg.se/en/>

1.4. Emergency telephone number

Emergency telephone 112 (Europe)

SECTION 2: Hazards identification

2.1. Classification of substance or mixture

Classification according to 67/548/EEC or 1999/45/EC F; R11
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS] Flam. Liq. 2; H225;

2.2. Label elements

Hazard Pictograms (CLP)



Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapour.

Precautionary statements	<p>P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.</p> <p>P233 Keep container tightly closed.</p> <p>P240 Ground/bond container and receiving equipment.</p> <p>P241 Use explosion-proof electrical/ventilating/lighting/equipment.</p> <p>P242 Use only non-sparking tools.</p> <p>P243 Take precautionary measures against static discharge.</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection.</p> <p>P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.</p> <p>P370 + P378 In case of fire: Use for extinction.</p> <p>P403 + P235 Store in a well-ventilated place. Keep cool.</p> <p>P501 Dispose of contents/container to</p>
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2.3. Other hazards

Other hazards	Not known.
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SECTION 3: Composition/information on ingredients

3.1. Substances

Substance	Identification	Classification	Contents
Ethanol	CAS no.: 64-17-5 EC no.: 200-578-6 Index no.: 603-002-00-5 Synonyms: Ethanol	F; R11 Flam. Liq. 2; H225	99,8 %
Column headings	CAS no. = Chemical Abstracts Service; EU (Einecs or Elincs number) = European inventory of Existing Commercial Chemical Substances; Ingredient name = Name as specified in the substance list (substances that are not included in the substance list must be translated, if possible). Contents given in; %, %wt/wt, %vol/wt, %vol/vol, mg/m ³ , ppb, ppm, weight%, vol%		
HH/HF/HE	T+ = Very toxic, T = Toxic, C = Corrosive, Xn = Harmful, Xi = Irritating, E = Explosive, O = Oxidizing, F+ = Extremely flammable, F = Very flammable, N = Environmental hazard		

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
Skin contact	Remove contaminated clothes and rinse skin thoroughly with water.
Eye contact	Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention if any discomfort continues.
Ingestion	NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Do not induce vomiting. Rinse mouth with water. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Information for health personnel	Treat Symptomatically. Do not give victim anything to drink if he is unconscious.
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4.3. Indication of any immediate medical attention and special treatment needed

Specific details on antidotes	No recommendation given.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.
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5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards HIGHLY FLAMMABLE! Solvent vapours may form explosive mixtures with air.
 Hazardous combustion products Fire creates: Carbon monoxide (CO). Carbon dioxide (CO₂).

5.3. Advice for firefighters

Fire fighting procedures No specific fire fighting procedure given.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal protection measures Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. Ventilate well. Stop leak if possible without risk. Avoid contact with skin and eyes. Do not breathe vapour.

6.2. Environmental precautions

Environmental precautionary measures Avoid discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up

Cleaning method Dam and absorb spillages with sand, earth or other non-combustible material.

6.4. Reference to other sections

Other instructions No recommendation given.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling Keep away from heat, sparks and open flame. Take precautionary measures against static discharges. Mechanical ventilation may be required.

Protective Safety Measures

Advice on general occupational hygiene Provide easy access to water supply and eye wash facilities.

7.2. Conditions for safe storage, including any incompatibilities

Storage Keep away from heat, sparks and open flame. Ground container and transfer equipment to eliminate static electric sparks. Store in a cool and well-ventilated place.

7.3. Specific end use(s)

Specific use(s) Not entered.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Other Information about threshold limit values Norske grenseverdier; FOR-2011-12-06-1358 vedlegg 1.
 Etanol: 8 t.: 500ppm, 950 mg/m³ (2003)

DNEL / PNEC

Exposure guidelines Country of origin: Sverige
 Limit value type: KTV
 OEL Short Term Value: 1900 mg/m³
 Source: Nationella hygieniska gränsvärden, AFS 2005:17
 Other Information NGV, 1000 mg/m³

8.2. Exposure controls

Occupational exposure limits Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of vapours. Protective gloves and goggles are recommended. Provide eyewash, quick drench.

Safety signs



Respiratory protection

Respiratory protection Respiratory protection must be used if air contamination exceeds acceptable level. Use respiratory equipment with gas filter, type A2.

Hand protection

Hand protection Use protective gloves. Chemical resistant gloves required for prolonged or repeated contact. Gloves of nitrile rubber, PVA or Viton are recommended.

Eye / face protection

Eye protection Use safety goggles or face shield in case of splash risk.

Skin protection

Skin protection (except hands) Wear appropriate clothing to prevent any possibility of skin contact.

Hygiene / Environmental

Specific hygiene measures Wash hands after contact.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Colour	Colourless.
Odour	Odour of alcohol.
Comments, pH (as supplied)	Not applicable.
Melting point/melting range	Value: -115 °C
Boiling point / boiling range	Value: 78 °C
Flash point	Value: 12 °C
Explosion limit	Value: 3,5-15 %
Vapour pressure	Value: 5,9 kPa Test temperature: 20 °C
Vapour density	Value: 1,6
Specific gravity	Value: 789 kg/m ³ Test temperature: 20 °C
Solubility description	Completely soluble in water. Soluble in: Organic solvents.
Partition coefficient: n-octanol/water	Value: -0,32
Spontaneous combustability	Value: 425 °C
Viscosity	Value: 1,2 mPas Test temperature: 20 °C

9.2. Other information**SECTION 10: Stability and reactivity****10.1. Reactivity**

Reactivity Heating may cause a fire.

10.2. Chemical stability

Stability Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Not known.

10.4. Conditions to avoid

Conditions to avoid Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid Avoid contact with oxidising agents (e.g. nitric acid, peroxides and chromates). Strong acids.

10.6. Hazardous decomposition products

Hazardous decomposition products Fire creates: Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological Information:

Other toxicological data	Acute Toxicity (Oral LD50): mg/kg (oral rat) 7060 Acute Toxicity (Inhalation LC50): mg/l (vapours) (4h) 124,7 Acute Toxicity (Dermal LD50): mg/kg (ipr-rat) > 20 000
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Potential acute effects

Inhalation	In high concentrations, vapours are narcotic and may cause headache, fatigue, dizziness and nausea. Icke klassificerad som aspirationstoxisk (Not classified as asp. tox.)
Skin contact	Prolonged or frequent contact may cause redness, itching, eczema and skin cracking. Defats the skin.
Eye contact	Causes serious eye irritation.
Ingestion	Ingestion of large amounts may cause unconsciousness. However, ingestion may cause nausea, headache, dizziness and intoxication. Ingestion may cause irritation of the gastrointestinal tract, vomiting and diarrhoea. May cause irritation to the mouth and throat.

Delayed effects / repeated exposure

Sensitisation	Not known.
Chronic effects	None known.

Carcinogenic, Mutagenic or Reprotoxic

Carcinogenicity	None.
Mutagenicity	Not known.
Teratogenic properties	Not known.
Reproductive toxicity	Not known.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic, fish	Value: 13500 mg/l Method of testing: LC50 Fish, species: Pimephales promelas Duration: 96h
Acute aquatic, algae	Value: 5000 mg/l Method of testing: IC50 Algae, species: Scenedesmus subspicatus Duration: 7d
Acute aquatic, Daphnia	Value: 5400 mg/l Method of testing: EC50 Daphnia, species: D. magna Duration: 72h

12.2. Persistence and degradability

Degradation half life	Lättnedbrytbart. 85% bryts ned på 28 dygn OECD 301D
Chemical oxygen demand (COD)	Value: 0,4-0,8 Method of testing: COD
Biological oxygen demand (BOD)	Value: 0,4-0,8 Method of testing: BOD

12.3. Bioaccumulative potential

Bioaccumulative potential	Will not bio-accumulate.
Bioconcentration factor (BCF)	Value: 0,66 Method of testing: BCF

12.4. Mobility in soil

Mobility	The product is water soluble and may spread in water systems.
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12.5. Results of PBT and vPvB assessment

PBT assessment results This substance is not classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects / Remarks None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Specify the appropriate methods of disposal	Confirm disposal procedures with environmental engineer and local regulations. Absorb in vermiculite or dry sand and dispose of at a licenced hazardous waste collection point. Liquid components can be disposed of by incineration.
Product classified as hazardous waste	Yes
Packaging classified as hazardous waste	No

SECTION 14: Transport information

14.1. UN number

ADR	1170
RID	1170
IMDG	1170
ICAO/IATA	1170

14.2. UN proper shipping name

ADR	ETHANOL
RID	ETHANOL
IMDG	ETHANOL
ICAO/IATA	ETHANOL

14.3. Transport hazard class(es)

ADR	3
Hazard no.	33
RID	3
ADN	33
IMDG	3
ICAO/IATA	3

14.4. Packing group

ADR	II
RID	II
IMDG	II
ICAO/IATA	II

14.5. Environmental hazards

Comment Not relevant.

14.6. Special precautions for user

EmS F-E, S-D

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

EC no. 200-578-6

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Other Label Information Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments.

Legislation and regulations Dangerous Substance Directive 67/548/EEC.
 The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716).
 The List of Wastes (England) (Amendment) Regulations 2005. (SI 2005 No. 895). Avfallsförordningen (2011:927).

15.2. Chemical safety assessment

SECTION 16: Other information

Hazard symbol



Highly flammable

R-phrases

R11 Highly flammable.

S-phrases

S2 Keep out of the reach of children.

S7 Keep container tightly closed.

S16 Keep away from sources of ignition - No smoking.

Classification according to
 Regulation (EC) No 1272/2008
 [CLP/GHS]

Flam. Liq. 2; H225;

List of relevant R-phrases (under
 headings 2 and 3).

R11 Highly flammable.

List of relevant H-phrases (Section
 2 and 3).

H225 Highly flammable liquid and vapour.

Responsible for safety data sheet

Fred Holmberg & Co AB

**JP-4 Fuel (MIL-T-5624)**

Version 1.4

Revision Date 2016-05-11

SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product information**

Product Name : JP-4 Fuel (MIL-T-5624)
Material : 1061880, 1028366, 1024271, 1024270, 1024269, 1105003

Use : Fuel

Company : Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

SECTION 2: Hazards identification**Classification of the substance or mixture**

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Emergency Overview**Danger**

Form: Liquid **Physical state:** Liquid **Color:** Clear to amber **Odor:** Mild

OSHA Hazards : Flammable Liquid, Moderate skin irritant, Carcinogen, Mutagen,
Target Organ Effects, Aspiration hazard

Classification

: Flammable liquids , Category 1

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Skin irritation , Category 2
 Germ cell mutagenicity , Category 1B
 Carcinogenicity , Category 1B
 Specific target organ systemic toxicity - single exposure ,
 Category 3
 Specific target organ systemic toxicity - repeated exposure ,
 Category 1 , Eyes, Blood
 Aspiration hazard , Category 1

Labeling

Symbol(s)



Signal Word

: Danger

Hazard Statements

: H224: Extremely flammable liquid and vapor.
 H304: May be fatal if swallowed and enters airways.
 H315: Causes skin irritation.
 H340: May cause genetic defects.
 H350: May cause cancer.
 H336: May cause drowsiness or dizziness.
 H372: Causes damage to organs (Eyes, Blood) through
 prolonged or repeated exposure.

Precautionary Statements

: **Prevention:**
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been
 read and understood.
 P210 Keep away from heat/sparks/open flames/hot surfaces.
 No smoking.
 P233 Keep container tightly closed.
 P240 Ground/bond container and receiving equipment.
 P241 Use explosion-proof electrical/ ventilating/ lighting/
 equipment.
 P242 Use only non-sparking tools.
 P243 Take precautionary measures against static discharge.
 P260 Do not breathe dust/fume/gas/mist/vapor/spray.
 P264 Wash skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves/ eye protection/ face protection.
 P281 Use personal protective equipment as required.
Response:
 P301 + P310 IF SWALLOWED: Immediately call a POISON
 CENTER/doctor.
 P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take
 off immediately all contaminated clothing. Rinse skin with
 water/ shower.
 P308 + P313 IF exposed or concerned: Get medical advice/
 attention.
 P331 Do NOT induce vomiting.
 P332 + P313 If skin irritation occurs: Get medical advice/
 attention.
 P362 Take off contaminated clothing and wash before reuse.
 P370 + P378 In case of fire: Use dry sand, dry chemical or
 alcohol-resistant foam for extinction.
Storage:

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P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity:**IARC**

Group 2B: Possibly carcinogenic to humans

Naphthalene 91-20-3

NTP

Reasonably anticipated to be a human carcinogen

Naphthalene 91-20-3

ACGIH

Confirmed animal carcinogen with unknown relevance to humans

Kerosene C9-C16 8008-20-6

SECTION 3: Composition/information on ingredients

Synonyms : Petroleum Naphtha
JP-4 AVIATION TURBINE FUEL
JP-4 (MIL-T-5624)

Molecular formula : Mixture

Component	CAS-No.	Weight %
Kerosene C9-C16	8008-20-6	70 - 90
Hydrodesulfurized Naphtha	64742-73-0	5 - 10
Isopentane	78-78-4	5 - 10
Naphthalene	91-20-3	1 - 5

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : Consult a physician after significant exposure. If unconscious place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

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SECTION 5: Firefighting measures

Flash point	:	-23 °C (-9 °F) estimated
Autoignition temperature	:	No data available
Suitable extinguishing media	:	Alcohol-resistant foam. Carbon dioxide (CO ₂). Dry chemical.
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Carbon oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

SECTION 7: Handling and storage**Handling**

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Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters****US**

Ingredients	Basis	Value	Control parameters	Note
Kerosene C9-C16	ACGIH	TWA	200 mg/m3	CNS impair, URT irr, skin irr, P, A3, Skin, varies,
	OSHA Z-1	TWA	500 ppm, 2,000 mg/m3	(b),
	OSHA Z-1-A	TWA	400 ppm, 1,600 mg/m3	
Isopentane	ACGIH	TWA	600 ppm,	peripheral neuropathy, (),
Naphthalene	ACGIH	TWA	10 ppm,	hematologic eff, URT irr, eye irr, eye dam, (), A4, Skin,
	ACGIH	STEL	15 ppm,	hematologic eff, URT irr, eye irr, eye dam, (), A4, Skin,
	OSHA Z-1	TWA	10 ppm, 50 mg/m3	(b),
	OSHA Z-1-A	TWA	10 ppm, 50 mg/m3	
	OSHA Z-1-A	STEL	15 ppm, 75 mg/m3	

- (i) Adopted values or notations enclosed are those for which changes are proposed in the NIC
 (b) The value in mg/m3 is approximate.
 A3 Confirmed animal carcinogen with unknown relevance to humans
 A4 Not classifiable as a human carcinogen
 CNS impair Central Nervous System impairment
 eye dam Eye damage
 eye irr Eye irritation
 hematologic eff Hematologic effects
 P Application restricted to conditions in which there are negligible aerosol exposures
 peripheral neuropathy Peripheral neuropathy
 Skin Danger of cutaneous absorption
 skin irr Skin irritation
 URT irr Upper Respiratory Tract irritation
 varies varies

Immediately Dangerous to Life or Health Concentrations (IDLH)

Substance name	CAS-No.	Control parameters	Update
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Naphthalene	91-20-3	Immediately Dangerous to Life or Health Concentration Value 250 ppm	1995-03-01
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Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

- Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.
- Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.
- Protective measures : Wear full protective clothing and self-contained breathing apparatus.

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

- Form : Liquid
Physical state : Liquid
Color : Clear to amber
Odor : Mild

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Safety data

Flash point	: -23 °C (-9 °F) estimated
Lower explosion limit	: 1.3 %(V)
Upper explosion limit	: 8 %(V)
Oxidizing properties	: no
Autoignition temperature	: No data available
Thermal decomposition	: No data available
Molecular formula	: Mixture
Molecular weight	: No data available
pH	: No data available
Pour point	: No data available
Boiling point/boiling range	: 22 °C (72 °F)
Vapor pressure	: 2.00 - 3.00 PSI at 37.8 °C (100.0 °F)
Relative density	: 0.751 at 15.6 °C (60.1 °F)
Water solubility	: Negligible
Partition coefficient: n-octanol/water	: No data available
Viscosity, kinematic	: No data available
Relative vapor density	: No data available
Evaporation rate	: No data available
Percent volatile	: > 99 %

SECTION 10: Stability and reactivity

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid : Heat, flames and sparks.

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Materials to avoid	: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Thermal decomposition	: No data available
Hazardous decomposition products	: Carbon oxides
Other data	: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information**JP-4 Fuel (MIL-T-5624)**

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity

Kerosene C9-C16 : LC50: > 5.2 mg/l
Exposure time: 4 h
Species: Rat

Isopentane : LC50: > 25.3 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Information given is based on data obtained from similar substances.

Acute dermal toxicity

Kerosene C9-C16 : LD50: >2000 milligram per kilogram
Species: Rabbit

JP-4 Fuel (MIL-T-5624)

Skin irritation : May cause skin irritation in susceptible persons.

JP-4 Fuel (MIL-T-5624)

Eye irritation : Vapors may cause irritation to the eyes, respiratory system and the skin.

Sensitization

Kerosene C9-C16 : Did not cause sensitization on laboratory animals.

Isopentane : Did not cause sensitization on laboratory animals.

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Naphthalene

Classification: Did not cause sensitization on laboratory animals.
Did not cause sensitization on laboratory animals.

Repeated dose toxicity

Kerosene C9-C16

: Species: Rabbit
Application Route: Dermal
Dose: 0, 200, 1000, 2000 mg/kg
Exposure time: 28 day
Number of exposures: 3 times/wk
Lowest observable effect level: 1,000 mg/kg

Isopentane

Species: Rat, male and female
Sex: male and female
Application Route: Inhalation
Dose: 668, 2220, 6646 ppm
Exposure time: 13 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: > 2220 ppm
Lowest observable effect level: > = 6646 ppm
Method: OECD Guideline 413
Target Organs: Kidney
Information given is based on data obtained from similar substances.

Carcinogenicity

Kerosene C9-C16

: Species: Mouse
Dose: 0, 28.5, 50, 100%
Exposure time: 104 wks
Number of exposures: 2, 4, or 7 times/wk
Remarks: Weak dermal carcinogen

Naphthalene

Species: Mouse
Sex: male
Dose: 10, 30 ppm
Exposure time: 105 weeks
Number of exposures: 6 hours/day, 5 days/week
Test substance: yes
Print Date: No information available.
Remarks: No evidence of carcinogenicity

JP-4 Fuel (MIL-T-5624)

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Species: Mouse
 Sex: female
 Dose: 10, 30 ppm
 Exposure time: 105 weeks
 Number of exposures: 6 hours/day, 5 days/week
 Test substance: yes
 Print Date: No information available.
 Remarks: increased incidence of alveolar/bronchiolar adenomas

Species: Rat
 Sex: male and female
 Dose: 10, 30, 60 ppm
 Exposure time: 105 weeks
 Number of exposures: 6 hours/day, 5 days/week
 Test substance: yes
 Print Date: No information available.
 Remarks: nose respiratory epithelial adenoma, increased incidence of olfactory neuroblastomas

Reproductive toxicity

Isopentane

: Species: Rat
 Sex: male and female
 Application Route: inhalation (vapor)
 Dose: 0, 500, 2000, 7000 ppm
 Number of exposures: 6 h/d 5 d/wk
 Method: OECD Test Guideline 416
 NOAEL Parent: 7000 ppm
 NOAEL F1: 2000 ppm
 NOAEL F2: 2000 ppm
 Information given is based on data obtained from similar substances.

Species: Rat
 Sex: female
 Application Route: oral gavage
 Dose: 0, 100, 300, 1000 mg/kg/d
 Method: OECD Test Guideline 415
 NOAEL Parent: $\geq 1,000$ mg/kg
 NOAEL F1: $\geq 1,000$ mg/kg

Species: Rat
 Sex: male
 Application Route: oral gavage
 Dose: 0, 100, 300, 1000 mg/kg/d
 Method: OECD Test Guideline 415
 NOAEL Parent: ≥ 300 mg/kg

Developmental Toxicity

Kerosene C9-C16

: Species: Rat
 Application Route: Inhalation
 Dose: 0, 106, 364 ppm
 Exposure time: 6 hrs/d
 Test period: GD 6-15
 NOAEL Teratogenicity: 364 ppm
 NOAEL Maternal: 364 ppm

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Isopentane

Species: Rat
 Application Route: oral gavage
 Dose: 0, 100, 500, 1000 mg/kg/d
 Exposure time: GD 6-15
 Number of exposures: daily
 Method: OECD Guideline 414
 NOEL Teratogenicity: 1,000 mg/kg
 NOEL Maternal: 1,000 mg/kg
 Information given is based on data obtained from similar substances.

Species: Rat
 Application Route: Inhalation
 Dose: 0, 500, 2000, 7000 ppm
 Exposure time: GD 6-15
 Number of exposures: 5 d/wk
 Method: OECD Guideline 414
 NOEL Teratogenicity: 7000 ppm
 NOEL Maternal: 500 - 2000 ppm
 Information given is based on data obtained from similar substances.

Species: Rabbit
 Application Route: Inhalation
 Dose: 0, 500, 2000, 7000 ppm
 Exposure time: GD 6-18
 Method: OECD Guideline 414
 NOEL Teratogenicity: 7000 ppm
 NOEL Maternal: 7000 ppm
 Information given is based on data obtained from similar substances.

Naphthalene

Species: Rabbit
 Application Route: oral gavage
 Dose: 40, 200, 400 mg/kg
 Test period: 29 d, GD 6-18
 NOEL Teratogenicity: 400 mg/kg

**JP-4 Fuel (MIL-T-5624)
Aspiration toxicity**

: May be fatal if swallowed and enters airways.
 Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

CMR effects

Hydrodesulfurized Naphtha

: Carcinogenicity: Possible human carcinogen
 Mutagenicity: In vivo tests showed mutagenic effects

Isopentane

Carcinogenicity: Not available
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects., In vivo tests did not show mutagenic effects
 Teratogenicity: Animal testing did not show any effects on fetal development.
 Reproductive toxicity: Animal testing did not show any effects on fertility.

Naphthalene

Carcinogenicity: Limited evidence of carcinogenicity in animal

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studies

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Further information**

: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

SECTION 12: Ecological information**Toxicity to fish**

Kerosene C9-C16 : LL50: 2 - 5 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
Method: OECD Test Guideline 203

Isopentane LC50: 4.26 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
semi-static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

Naphthalene LC50: 3.2 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates

Kerosene C9-C16 : EL50: 1.4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Isopentane EC50: 2.3 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
static test Method: OECD Test Guideline 202

Naphthalene LC50: 2.16 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Toxicity to algae

Kerosene C9-C16 : EL50: 1 - 3 mg/l
Exposure time: 72 h
Species: Raphidocellus subcapitata (algae)
Method: OECD Test Guideline 201

Isopentane EC50: 7.51 mg/l
Exposure time: 72 h
Species: Scenedesmus capricornutum (fresh water algae)
Growth inhibition Method: OECD Test Guideline 201
Information given is based on data obtained from similar

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substances.

Naphthalene EC50: 2.96 mg/l
 Exposure time: 48 h
 Species: Selenastrum capricornutum (algae)

Elimination information (persistence and degradability)

Bioaccumulation

Isopentane : Accumulation in aquatic organisms is unlikely.

Biodegradability : Expected to be ultimately biodegradable

Ecotoxicology Assessment

Acute aquatic toxicity
 Kerosene C9-C16 : Toxic to aquatic life.

Isopentane : Toxic to aquatic life.

Naphthalene : Very toxic to aquatic life.

Chronic aquatic toxicity
 Kerosene C9-C16 : Toxic to aquatic life with long lasting effects.

Isopentane : Toxic to aquatic life with long lasting effects.

Naphthalene : Very toxic to aquatic life with long lasting effects.

Results of PBT assessment
 Isopentane : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological
 information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product.

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Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I, (-23 °C), MARINE POLLUTANT, (KEROSENE, C9-C12)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS, (KEROSENE, C9-C12)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I, ENVIRONMENTALLY HAZARDOUS, (KEROSENE, C9-C12)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN1863, FUEL, AVIATION, TURBINE ENGINE, 3, I, ENVIRONMENTALLY HAZARDOUS, (KEROSENE, C9-C12)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information**National legislation**

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard

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Chronic Health Hazard

CERCLA Reportable Quantity : 1667 lbs

Isopentane

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA 313 Ingredients : The following components are subject to reporting levels established by SARA Title III, Section 313:

: Naphthalene - 91-20-3

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):

: Isopentane - 78-78-4

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

: Isopentane - 78-78-4

US State Regulations

Pennsylvania Right To Know

: Kerosene C9-C16 - 8008-20-6
Isopentane - 78-78-4
Naphthalene - 91-20-3

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New Jersey Right To Know

: Kerosene C9-C16 - 8008-20-6
 Isopentane - 78-78-4
 Naphthalene - 91-20-3

California Prop. 65
Ingredients

: WARNING! This product contains a chemical known in the State of California to cause cancer.

Notification status

Europe REACH

: A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.

United States of America TSCA

: On the inventory, or in compliance with the inventory

Canada DSL

: All components of this product are on the Canadian DSL

Australia AICS

: On the inventory, or in compliance with the inventory

New Zealand NZIoC

: Not in compliance with the inventory

Japan ENCS

: Not in compliance with the inventory

Korea KECI

: On the inventory, or in compliance with the inventory

Philippines PICCS

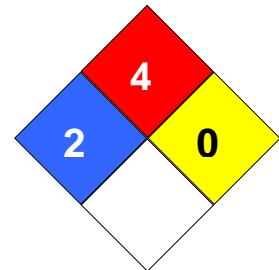
: On the inventory, or in compliance with the inventory

China IECSC

: Not in compliance with the inventory

SECTION 16: Other information**NFPA Classification**

: Health Hazard: 2
 Fire Hazard: 4
 Reactivity Hazard: 0

**Further information**

Legacy SDS Number : 001927

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		



SAFETY DATA SHEET

Gasoline Unleaded With Ethanol

1. IDENTIFICATION

Product Identifier Gasoline, Unleaded With Ethanol

Synonyms: Regular Unleaded Gasoline, Premium Unleaded Gasoline, Mid-grade Unleaded Gasoline, Reformulated Blendstock for Oxygenate Blending (RBOB) w/Ethanol, Premium Blendstock for Oxygenate Blending (PBOB) w/Ethanol, Conventional Blendstock for Oxygenate Blending (CBOB) w/Ethanol, Unleaded Gasoline

Intended use of the product: Fuel

Contact: Global Companies LLC
Water Mill Center
800 South St.
Waltham, MA 02454-9161
www.globalp.com

Contact Information: EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300
COMPANY CONTACT (business hours): 800-542-0778

2. HAZARD IDENTIFICATION

According to OSHA 29 CFR 1910.1200 HCS

Classification of the Substance or Mixture

Classification (GHS-US):

Flammable Liquid	Category 2	H225
Acute Toxicity	Category 4	H332
Skin Corrosion/Irritation	Category 2	H315
Carcinogenicity	Category 1A	H350
Germ Cell Mutagenicity	Category 1B	H340
Reproductive Toxicity	Category 2	H361d
STOT RE	Category 1	H372
Aspiration Hazard	Category 1	H304

Labeling Elements



Signal Word (GHS-US):

Hazard Statements (GHS-US):

Danger

H225 – Highly flammable liquid and vapor.
H304 - May be fatal if swallowed and enters airways.
H332 - Harmful if inhaled.
H315 - Causes skin irritation.
H350 – May cause cancer.
H340 – May cause genetic defects.
H361 – Suspected of damaging fertility or the unborn child.
H372 – Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements (GHS-US)

P201 - Obtain special instructions before use.
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.



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P233 - Keep container tightly closed.
 P240 – Ground/bond container and receiving equipment.
 P241 – Use explosion-proof electrical/ventilating/lighting equipment pursuant to applicable electrical code.
 P242 – Use only non-sparking tools.
 P243 – Take precautionary measures against static discharge.
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.
 P303+361+353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse with water/shower.
 P308+311 - If exposed or concerned: Get medical advice/attention.
 P301+310 - If swallowed: Immediately call a poison center/doctor/...
 P331 - Do NOT induce vomiting.
 P370+P378 – In case of fire use firefighting foam or other appropriate media for Class B fires to extinguish.
 P403 - Store in a well-ventilated place. Keep cool.
 P405 - Store locked up.
 P501 – Dispose of contents/container in accordance with local/regional/national/international regulation.

Other information:

NFPA 704
 Health: 1
 Fire: 3
 Reactivity:0



3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Composition Information

Name	Product Identifier (CAS#)	% (w/w)	Classification
Gasoline	8006-61-9	100	Carc 1B, H350; Muta 1B, H340; Asp 1, H304
Benzene	71-43-2	0.1 to 4.9 (0.1 to 1.3*)	Flam liq 2, H225; Carc 1A, H350; Muta 1B H340; STOT RE 1, H372; Asp 1, H304; Eye Irrit 2, H319; Skin Irrit 2, H315
Ethyl Alcohol (Ethanol)	64-17-5	0 – 10	Flam Liq 2 H225
Toluene	108-88-3	0 - 15	Flam liq 2, H225; Repro 2, H361d; STOT RE 2, H373; Asp 1, H304; Skin Irrit 2, H315; STOT SE 3, H336
Xylene, mixed isomers	1330-20-7	0 - 15	Flam Liq 3, H226; Acute Tox 4, H332; Acute Tox 4, H312; Skin Irrit 2, H315
Ethyl Benzene	100-41-4	< 4	Flam Liq 2, H225; Acute Tox 4, H332; STOT RE 2, H373; Asp 1, H304
1,2,4- Trimethylbenzene	95-63-6	<5	Flam Liq 3, H226; Acute Tox 4, H332; Acute Tox 4, H312; Skin Irrit 2, H315; Eye Irrit 2, H319; STOT SE 3, H335; Acute Aquatic 2, H411

*for reformulated gasoline



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Gasoline Unleaded With Ethanol

Additional Formulation Information

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. Butane is often added to increase volatility, especially in winter. May contain antioxidant and multifunctional additives. Oxygenated and reformulated gasoline will have legally-required amounts of oxygenates (Ethanol) to increase octane levels.

RBOB and PBOB are gasoline base stocks and do not contain any Oxygenates (Ethanol).

*Also see Section 15 for list of SARA Section 313 toxic chemicals.

4. FIRST AID MEASURES

Route	Measures
Inhalation	Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.
Ingestion	Aspiration Hazard: DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.
Eye Contact	If present, remove contact lenses. In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 mm. Hold eyelids open to ensure adequate flushing. Seek medical attention.
Skin Contact	Remove contaminated clothing and shoes. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.
Absorption	As with skin contact, remove contaminated clothing and flush with copious amounts of water. Flush affected area for at least 15 minutes to minimize potential for further absorption. Seek medical attention if significant portions of skin have been exposed.

Most Important Symptoms

Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

Immediate Medical Attention and Special Treatment

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

Application of epinephrine may cause cardiac arrhythmia in persons exposed to large quantities of hydrocarbon vapor or due to skin absorption. Observe for development of symptoms leading to cardiac arrhythmia.

Urine samples may be obtained to determine biological effects of benzene exposure and should be collected in accordance with the medical surveillance criteria in 29 CFR 1910.1028.

Contaminated clothing, including shoes may present a fire hazard and should be discarded

Medical Conditions Aggravated by Exposure

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain additional additives. Firefighting



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foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 'Low Expansion Foam -1994 Edition.'

Specific Hazards / Products of Combustion

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Combustion may produce smoke, carbon monoxide and other products of incomplete combustion.

Special Precautions and Protective Equipment for Firefighters

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other firefighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full face piece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 9 for fire properties of this chemical including flash point, autoignition temperature, and explosive limits

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

ACTIVATE FACILITY SPCC, SPILL CONTINGENCY or EMERGENCY PLAN.

Depending on the size of the spill, downwind receptors may need to be notified.

Evacuate nonessential personnel and remove or secure all ignition sources (flame, spark, hot work, hot metal, etc.). Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Do not touch or walk-through spilled material.

Highly flammable material, even small spills may pose a fire danger for emergency responders. Due to high vapor density, flammable / toxic vapors may be present in low lying areas, dikes, pits, drains, or trenches. Ventilate the area. Use of non-sparking tools and intrinsically safe equipment is recommended. Potential for flammable atmosphere should be monitored using a combustible gas indicator positioned downwind of the spill area. See Sections 2 and 7 for further hazard warnings and handling instructions.

Use appropriate personal protective equipment to prevent eye/skin contact and absorption. Use NIOSH approved respiratory protection, if warranted, to prevent exposures above permissible limits (see Section 8). Contaminated clothing should not be near sources of ignition.

Environmental Precautions

Stop the spill to prevent environmental release if it can be done safely. Product is toxic to aquatic life. Take action to isolate environmental receptors including drains, storm sewers and natural water bodies. Keep on impervious surface if at all possible. Use water sparingly to prevent product from spreading. Foam and absorbents may be used to reduce / prevent airborne release.

Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Follow federal, state or local requirements for reporting environmental release where necessary (see Section 15 for further information)

Containment and Clean-Up Methods

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking absorbents, or absorbent



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boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of firefighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with dry earth, sand or other non-combustible, inert oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container with clean, non-sparking tools for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING AND STORAGE

Handling Precautions

USE ONLY AS A FUEL

DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame. No smoking. Electrical equipment should be approved for classified area. Bond and ground containers during product transfer pursuant to NFPA 70 and API RP 2003 to reduce the possibility of static-initiated fire or explosion. Follow precautions to prevent static initiated fire.

Use good personal hygiene practices. Use only with protective equipment specified in Section 8. Avoid repeated and/or prolonged skin exposure. Use only outdoors or in well ventilated areas. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and laundry before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves. Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.

Vapors are heavier than air and can accumulate in low lying areas (e.g., tanks, pits, vaults, dikes, drains, etc.) Follow specific procedures for confined space entry in areas where product may be present pursuant to OSHA requirements in 29 CFR 1910.146. Atmospheric testing using a combustible gas indicator may be necessary in confined areas where product may be present.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

Storage

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Separate from incompatible materials (see Section 10) by distance or secondary containment.

Store in a well-ventilated area. Protect containers from damage and vehicular traffic. Post "No Smoking" signs in product storage areas. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".



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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Component	CAS #	List	Value
Gasoline	8006-61-9	ACGIH TWA ACGIH STEL	300 ppm 500 ppm
Benzene	71-43-2	ACGIH TLV-TWA ACGIH STEL OSHA AL OSHA TWA OSHA STEL	0.5 ppm* Skin; A1; BEI 2.5 ppm* Skin, A1: BEI 0.5 ppm 1 ppm 5 ppm
Ethyl Alcohol (Ethanol)	64-17-5	ACGIH STEL OSHA PEL	1000 ppm 1000 ppm
Toluene	108-88-3	ACGIH TWA OSHA TWA OSHA Ceiling limit OSHA Ceiling limit Peak	20 ppm 200 ppm 300 ppm 500 ppm (10 min)
Xylene, mixed isomers	1330-20-7	ACGIH TWA ACGIH STEL OSHA PEL	100 ppm 150 ppm 100 ppm
Ethyl Benzene	100-41-4	ACGIH TWA OSHA PEL OSHA STEL	20 ppm 100 ppm 125 ppm
1,2,4- Trimethylbenzene	95-63-6	ACGIH TWA	25 ppm

*Skin designation indicates the chemical is skin absorbable

Engineering Controls

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and

Flammability limits, particularly in confined spaces. Intrinsically safe equipment and non-sparking tools shall be used in circumstances where concentrations may exceed lower flammable limits. Grounding and bonding shall be used to prevent accumulation and discharge of static electricity.

Emergency shower and eyewash should be provided in proximity to handling areas in the event of exposure to decontaminate.

Personal Protective Equipment

Exposure	Equipment
Eye / Face	Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.
Skin	Gloves constructed of nitrile or neoprene are recommended when handling this material. If contact with the body is expected, chemical protective clothing such as of E.I. DuPont Tychem®, Barricade®, or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.
Respiratory	Personal protective equipment (PPE) should meet recommended national standards. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134 and the OSHA Benzene Standard, 29 CFR 1910.1028. Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection. Specific requirements under the OSHA occupational exposure to Benzene may apply if concentrations exceed the action level or permissible limits. Consult 29 CFR 1910.1028 for further information)



SAFETY DATA SHEET

Gasoline Unleaded With Ethanol

Exposure	Equipment
Thermal	Product is stored at ambient temperature. No thermal protection is required except for emergency operations involving actual or potential for fire.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	Comments									
Appearance	A clear, water-like liquid										
Odor	A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with Ethanol may have a alcohol-like odor and is detectable at a lower concentration than non-oxygenated gasoline.										
Odor Threshold	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Parameter</th> <th>Odor Detection</th> <th>Odor Recognition</th> </tr> </thead> <tbody> <tr> <td>Non-oxygenated gasoline</td> <td>0.5-0.6 ppm</td> <td>0.8-1.1 ppm</td> </tr> <tr> <td>Gasoline with 10% Ethanol</td> <td>0.2-0.3 ppm</td> <td>0.4-0.7 ppm</td> </tr> </tbody> </table>	Parameter	Odor Detection	Odor Recognition	Non-oxygenated gasoline	0.5-0.6 ppm	0.8-1.1 ppm	Gasoline with 10% Ethanol	0.2-0.3 ppm	0.4-0.7 ppm	
Parameter	Odor Detection	Odor Recognition									
Non-oxygenated gasoline	0.5-0.6 ppm	0.8-1.1 ppm									
Gasoline with 10% Ethanol	0.2-0.3 ppm	0.4-0.7 ppm									
pH	Not available										
Melting / Freeze Point	- 150 °F										
Boiling Point And Range	85 to 437 °F (39 to 200 C)										
Flash Point	-45 °F (-43 C)										
Evaporation Rate	10-11	(n-butyl acetate = 1)									
Flammability	Flammable liquid										
Flammability Limits	1.4 – 7.6%	(est)									
Vapor Pressure	7-15 RVP @100 °F (38 C) 275-475mm Hg @ 68 °F (20 C)										
Vapor Density	AP 3 to 4										
Specific Gravity	0.76	(water =1)									
Solubility	Non-oxygenated gasoline-negligible (<0.1% @77°F). Gasoline with 10% Ethanol has greater solubility than other oxygenates										
Partition Coefficient	2-7	as Log P									
Autoignition Temperature	highly variable; >530 °F (>280 C)										
Decomposition Temperature	Evaporation or ignition likely before decomposition will occur										
Viscosity	0.64 – 0.88 mm ² /sec										
Percent Volatiles	100%										

10. STABILITY AND REACTIVITY

Reactivity

Material is not self reacting, flammable concentrations may be present in air.

Stability

Normally stable unless mixed with incompatibles or fire in presence of an ignition source. Material is flammable liquid.



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Gasoline Unleaded With Ethanol

Reactions / Polymerization

Stable. Hazardous polymerization will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

Incompatible Materials

Keep away from strong acids and oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Acute Toxicity (Inhalation LC50)

Gasoline (8006-61-9)	
LC50 Inhalation Human	2000 ppm/1 hr
Benzene (71-43-2)	
LC50 Inhalation Rat	10,000 ppm/7 hr
Ethanol (64-17-5)	
LC50 Inhalation Rat	>20,000 ppm/10 hr
Toluene (108-88-3)	
LC50 Inhalation Mouse	400 ppm/4 hr
1,2,4 Trimethylbenzene (95-63-6)	
LC50 Inhalation Mouse	2000 ppm/48 hr
Xylene (1330-20-7)	
LC50 Inhalation Rat	6350 ppm/4 hr

Acute Toxicity (Oral LC50)

Gasoline (8006-61-9)	
LC50 Oral Rat	14,063 mg/l/4h
Benzene (71-43-2)	
LC50 Oral Rat	3306 mg/kg
Ethanol (64-17-5)	
LC50 Oral Rat	7060 mg/kg
Toluene (108-88-3)	
LC50 Oral Rat	2600 mg/kg
1,2,4 Trimethylbenzene (95-63-6)	
LC50 Oral Rat	3550 mg/kg
Xylene (1330-20-7)	
LC50 Oral Rat	>3500 mg/kg
Ethylbenzene (100-41-4)	
LC50 Oral Rat	3500 mg/kg

Acute Toxicity (Dermal LC50)

Gasoline (8006-61-9)	
LD50 Dermal Rabbit	>5 mL/kg
Benzene (71-43-2)	
LD50 Dermal Rabbit	>8260 mg/kg
Toluene (108-88-3)	
LC50 Dermal Rabbit	12,200 mg/kg
1,2,4 Trimethylbenzene (95-63-6)	
LC50 Dermal Rabbit	>3160 mg/kg



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Gasoline Unleaded With Ethanol

Xylene (1330-20-7)	
LC50 Dermal Rabbit	>43 g/kg
Ethylbenzene (100-41-4)	
LC50 Dermal Rabbit	17,800 mg/kg

Skin Corrosion/Irritation: Causes skin irritation.

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: May cause genetic defects.

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and byproducts of combustion are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. The NTP, ARC, OSHA and ACGIH list benzene as a human carcinogen.

Reproductive Toxicity: May damage/Suspected of damaging fertility or the unborn child.

Teratogenicity: Not available

Specific Target Organ Toxicity (Repeated Exposure): Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

Specific Target Organ Toxicity (Single Exposure): Single over-exposure likely to cause central nervous system effects (dizziness and drowsiness), excessive exposure could cause paralysis or cardiac arrhythmia.

Aspiration Hazard: This chemical is considered to be an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Potential Health Effects: Vapor irritating to eyes, nose, and throat. Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur. Inhalation at high concentrations in confined spaces with less than 16% oxygen needed to sustain life, skin and /or eye contact (liquid).

Chronic effects: Human inhalation (chronic) >500 ppm (approx 1.8 mg/L)/ day. Effects: May cause vomiting, diarrhea, insomnia, headache dizziness, anemia, muscle & neurological symptoms.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

12. ECOLOGICAL INFORMATION

Toxicity

Material is toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

EC50 Daphnia	30 mmol/m3 (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish	7.7 mg/l (Exposure time: 96 h - Species: Pimephales promelas)



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Persistence and Degradation: Not available

Bioaccumulative Potential: Not available

Mobility In Soil: Not available

Other Adverse Effects: None known

Other Information: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options. May be considered a hazardous waste if disposed. Direct solid waste (landfill) or incineration at a solid waste facility is not permissible. Do not discharge to sanitary or storm sewer. Personnel handling waste containers should follow precautions provided in this document.

Shipping containers must be DOT authorized packages. Follow licensure and regulations for transport of hazardous material and hazardous waste as applicable.

14. TRANSPORT INFORMATION

US DOT

UN Identification Number	UN 1203
Proper Shipping Name	Gasoline
Hazard Class and Packing Group	3, PG II
Shipping Label	Flammable Liquid
Placard / Bulk Package	Flammable / 1203
Emergency Response Guidebook Guide Number	128

IATA Cargo

UN Identification Number	UN1203
Shipping Name / Description	Gasoline
Hazard Class and Packing Group	3, PG II
ICAO Label	3
Packing Instructions Cargo	364, Y341
Max Quantity Per Package Cargo	60 L

IATA Passenger

UN Identification Number	UN1203
Shipping Name / Description	Gasoline
Hazard Class and Packing Group	3, PG II
ICAO Label	3
Packing Instructions Passenger	353, Y341
Max Quantity Per Package	5 L

IMDG

UN Identification Number	UN1203
Shipping Name / Description	Gasoline
Hazard Class and Packing Group	3, PG II
IMDG Label	3
EmS Number	F-E S-E
Marine Pollutant	No

15. REGULATORY INFORMATION

U.S. Federal, State, and Local Regulatory Information

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local



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Gasoline Unleaded With Ethanol

regulations; consult those regulations applicable to your facility/operation.

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	No

Clean Water Act (Oil Spills)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA Section 103 and SARA Section 304 (Release to the Environment)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA Section 313- Supplier Notification

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

- Benzene (71-43-2)
- Benzene (71-43-2) for reformulated gasoline
- Ethyl benzene (100-41-4)
- n-Hexane (110-54-3)
- Toluene (108-88-3)
- 1,2,4- Trimethylbenzene (95-63-6)
- Xylene, mixed isomers (1330-20-7)
- Ethyl Alcohol (Ethanol)

Information on each ingredient's concentration can be found in Section 3

Information on each ingredient's exposure limits can be found in Section 8

EPA Notification (Oil Spills)

If there is a discharge of more than 1,000-gallons of oil into or upon navigable waters of the United States, or if it is the second spill event of 42 gallons or more of oil into water within a twelve (12) month period, a written report must be submitted to the Regional Administrator of the EPA within sixty days of the event.

Pennsylvania Right to Know Hazardous Substance list:

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

Component	CAS	Amount
Benzene	71-43-2	0.1-4.9%
Xylene	1330-20-7	0-15%
Toluene	108-88-3	0-15%
1,2,4-Trimethylbenzene	95-63-6	<5%
Ethyl Benzene	100-41-4	<4%
Ethyl Alcohol	64-17-5	0-10%



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Gasoline Unleaded With Ethanol

New Jersey Right to Know Hazardous Substance list:

The following product components are cited in the New Jersey Right to Know Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Gasoline	8006-61-9	100%
Benzene	71-43-2	0.1-4.9%
Xylene	1330-20-7	0-15%
Toluene	108-88-3	0-15%
1,2,4-Trimethylbenzene	95-63-6	<5%
Ethyl Benzene	100-41-4	<4%
Ethyl Alcohol	64-17-5	0-10%

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause Cancer or Reproductive Toxicity.

Component	CAS	Amount
Benzene	71-43-2	0.1-4.9%
Toluene	108-88-3	0-15%
Ethyl Benzene	100-41-4	<4%
Ethyl Alcohol	64-17-5	0-10%

U.S. 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.

Canadian Regulatory Information (WHMIS)

Class B, Division 2 (Flammable Liquid)

Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

Version	5
Issue Date	May 20, 2016
Prior Issue Date	March 3, 2015

Description of Revisions

Revised to meet Globally Harmonized System for chemical hazard communication requirements pursuant to OSHA regulatory revisions 77 FR 17884, March 26, 2012.

Abbreviations

°F	Degrees fahrenheit (temperature)	mg	Milligrams
<	Less than	mL	Milliliter
=	Equal to	mm ²	Square millimeters
>	Greater than	mmHg	Millimeters of mercury (pressure)
AP	Approximately	ppm	Parts per million
C	Centigrade (temperature)	sec	Second
kg	Kilogram	ug	Micrograms
L	Liter		



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Gasoline Unleaded With Ethanol

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
AIHA	American Industrial Hygiene Association	OPA	Oil Pollution Act of 1990
AL	Action Level	OSHA	U.S. Occupational Safety & Health Administration
ANSI	American National Standards Institute	PEL	Permissible Exposure Limit (OSHA)
API	American Petroleum Institute	RCRA	Resource Conservation and Recovery Act Reauthorization Act of 1986 Title III
CAS	Chemical Abstract Service	REL	Recommended Exposure Limit (NIOSH)
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	RVP	Reid Vapor Pressure
DOT	U.S. Department of Transportation	SARA	Superfund Amendments and
EC50	Ecological concentration 50%	SCBA	Self Contained Breathing Apparatus
EPA	U.S. Environmental Protection Agency	SPCC	Spill Prevention, Control, and Countermeasures
ERPG	Emergency Response Planning Guideline	STEL	Short-Term Exposure Limit (generally 15 minutes)
GHS	Global Harmonized System	TLV	Threshold Limit Value (ACGIH)
HMIS	Hazardous Materials Information System	TSCA	Toxic Substances Control Act
IARC	International Agency for Research On Cancer	TWA	Time Weighted Average (8 hr.)
IATA	International Air Transport Association	UN	United Nations
IMDG	International Maritime Dangerous Goods	UNECE	United Nations Economic Commission for Europe
Koc	Soil Organic Carbon	WEEL	Workplace Environmental Exposure Level (AIHA)
LC50	Lethal concentration 50%	WHMIS	Canadian Workplace Hazardous Materials Information System
LD50	Lethal dose 50%		
MSHA	Mine Safety and Health Administration		
NFPA	National Fire Protection Association		
NIOSH	National Institute of Occupational Safety and Health		
NOIC	Notice of Intended Change		

Disclaimer of Expressed and Implied Warranties

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

** End of Safety Data Sheet **

ISOSET® CX47 ADHESIVE
121440

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Ashland	Regulatory Information Number	1-800-325-3751
P.O. Box 2219	Telephone	614-790-3333
Columbus, OH 43216	Emergency telephone	1-800-ASHLAND (1-800-274-5263)

Product name	ISOSET® CX47 ADHESIVE
Product code	121440
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid,, dark brown

WARNING! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. HARMFUL IF INHALED. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION.

Potential Health Effects

Routes of exposure

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact

Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin contact

Can cause skin irritation. Symptoms may include redness and burning of skin, and other skin damage. Additional symptoms of skin contact may include: allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects) Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion

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Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing this material may be harmful or fatal. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:., upper respiratory tract, Skin, lung (for example, asthma-like conditions)

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:., stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), runny nose, cough, discomfort in the chest, headache, chest pain, shortness of breath, difficulty in breathing, lung edema (fluid buildup in the lung tissue), Exposure to this product (or a component) may cause an allergic reaction (narrowing of the air passages of the lungs resulting in difficult breathing, tightness in the chest, coughing and wheezing) in some sensitive individuals. Other symptoms of an allergic reaction may include itchy and watery eyes, runny and stuffy nose, sweating, flushing, hives, rapid heart rate, and lowered blood pressure.

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:., nasal damage, lung damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:., respiratory sensitization, effects on lung function

Carcinogenicity

In a two-year inhalation study in rats, exposure to polymeric methylene bisphenylisocyanate (MDI) aerosol caused a significant increase in benign (noncarcinogenic) lung tumors, along with a single carcinogenic lung tumor, at the highest dose only (6 mg/m³). The tumors occurred along with irritation of the respiratory tract and the accumulation of a yellow material in the lungs. There was irritation only at 1.0 mg/m³ and no effect at 0.2 mg/m³. MDI is not listed as carcinogenic by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the Occupational Safety and Health Administration (OSHA).

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Reproductive hazard

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration
POLY(METHYLENEPHENYLENE)	9016-87-9	>=50-<60%
POLYISOCYANATE		
4,4'-DIPHENYLMETHANE	101-68-8	>=40-<50%
DIISOCYANATE		
METHYLENE	26447-40-5	>=5-<10%
DIPHENYLISOCYANATE		

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention. If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

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If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Notes to physician

Hazards: Pulmonary edema may be delayed.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Dry chemical, Foam, Water spray, Carbon dioxide (CO₂)

Hazardous combustion products

May form: carbon dioxide and carbon monoxide, Hydrogen cyanide (hydrocyanic acid), nitrogen compounds, hydrocarbons

Precautions for fire-fighting

Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid. Polymerization will take place under fire conditions. If polymerization occurs in a closed container, there is a possibility it will rupture violently. Cool storage container with water, if exposed to fire.

Flammability Class for Flammable Liquids

Combustible Liquid Class IIIB

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

No data

Environmental precautions

No data

Methods for cleaning up

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Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Neutralize spill with an aqueous solution of ammonia. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into containers.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage

Store in tightly closed containers. Do not allow moisture or water contamination of product. Contamination with water can cause dangerous pressure buildup in resealed containers. Do not reseal containers if contamination is suspected.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

**4,4'-DIPHENYLMETHANE
DIISOCYANATE**

101-68-8

ACGIH	time weighted average	0.005 ppm
NIOSH	Recommended exposure limit (REL):	0.005 ppm
NIOSH	Recommended exposure limit (REL):	0.05 mg/m ³
NIOSH	Ceiling Limit Value and Time Period (if specified):	0.020 ppm
NIOSH	Ceiling Limit Value and Time Period (if specified):	0.2 mg/m ³
OSHA Z1	Ceiling Limit Value:	0.02 ppm
OSHA Z1	Ceiling Limit Value:	0.2 mg/m ³
OSHA Z1A	Ceiling Limit Value:	0.02 ppm
OSHA Z1A	Ceiling Limit Value:	0.2 mg/m ³
US CA OEL	Time Weighted Average (TWA)	0.005 ppm
US CA OEL	Permissible Exposure Limit (PEL):	
US CA OEL	Time Weighted Average (TWA)	0.051 mg/m ³
US CA OEL	Permissible Exposure Limit (PEL):	

General advice

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These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Eye protection

Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.

Wear resistant gloves such as:

Nitrile rubber

butyl-rubber

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	No data
Colour	dark brown

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Odour	musty
Boiling point/boilingrange	646.00 °F / 646 °F@ 760.00 mmHg
pH	No data
Flash point	389.98 °F / 198.88 °C, Seta closed cup
Evaporation rate	> 1 (Ethyl Ether)
Explosion limits	No data
Vapour pressure	1.00 mmHg @ 50.00 °F / 10.00 °C
Vapour density	8.5 (AIR=1)
Density	1.24 g/cm ³ @ 77.0 °F / 25.0 °C 10.33 lb/gal @ 77.00 °F / 25.00 °C
Solubility	not applicable in water
Partition coefficient: n-octanol/water	No data
log Pow	no data available
Autoignition temperature	No data

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid

Incompatible products

Avoid contact with strong alkalis, strong mineral acids, and water., Avoid contact with:, alcohols, Amines, strong alkalis, strong mineral acids, water

Hazardous decomposition products

carbon dioxide and carbon monoxide, Hydrogen cyanide (hydrocyanic acid), nitrogen compounds, hydrocarbons

Hazardous reactions

Product can undergo hazardous polymerization.

Thermal decomposition

No data

11. TOXICOLOGICAL INFORMATION

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Acute oral toxicity

POLY(METHYLENEPHENYLENE) POLYISOCYANATE	LD 50 Rat: > 10,000 mg/kg
4,4'-DIPHENYLMETHANE DIISOCYANATE	LD 50 Rat: 9,200 mg/kg
METHYLENE DIPHENYLISOCYANATE	LD 50 Rat: > 15,800 mg/kg

Acute inhalation toxicity

POLY(METHYLENEPHENYLENE) POLYISOCYANATE	LC 50 Rat: 369 - 490 mg/m ³ , 4 h
4,4'-DIPHENYLMETHANE DIISOCYANATE	LC 50 Rat: 0.369 mg/l , 4 h
METHYLENE DIPHENYLISOCYANATE	LC 50 Rat: 490 mg/m ³ , 4 h

Acute dermal toxicity

POLY(METHYLENEPHENYLENE) POLYISOCYANATE	LD 50 Rabbit: > 10,000 mg/kg
4,4'-DIPHENYLMETHANE DIISOCYANATE	LD 50 Rabbit: > 7,900 mg/kg
METHYLENE DIPHENYLISOCYANATE	LD 50 Rabbit: > 5,010 mg/kg

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Acute and Prolonged Toxicity to Fish

No data

Acute Toxicity to Aquatic Invertebrates

No data

Environmental fate and pathways

No data

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Destroy by liquid incineration in accordance with applicable regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

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14. TRANSPORT INFORMATION

Dangerous goods descriptions (if indicated above) may not reflect package size, quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

SARA Hazard Classification Acute Health Hazard

SARA 313 Component(s)

POLY(METHYLENEPHENYLENE) POLYISOCYANATE	9016-87-9	50%
4,4'-DIPHENYLMETHANE DIISOCYANATE	101-68-8	45%

Reportable quantity - Product

US. EPA CERCLA Hazardous Substances (40 CFR 302) 11111 lbs

Reportable quantity - Components

POLY(METHYLENEPHENYLENE) POLYISOCYANATE	9016-87-9	none
4,4'-DIPHENYLMETHANE DIISOCYANATE	101-68-8	5000 lbs
METHYLENE DIPHENYLISOCYANATE	26447-40-5	none

	Health	Flammability	Reactivity	Other
HMIS	2*	1	1	
NFPA	3	1	1	

16. OTHER INFORMATION

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The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).



TECHNICAL BULLETIN

STRUCTURAL BOARD ASSOCIATION

Representing the OSB Industry

25 Valleywood Drive, Unit 27, Markham, Ontario, Canada L3R 5L9

Tel: 905-475-1100 • Fax: 905-475-1101 • E-mail: info@osbguide.com • website: http://www.osbguide.com

GENERIC ORIENTED STRAND BOARD MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

Product Name: Oriented Strand Board

Synonyms: OSB, Waferboard, Rim Board, Web Stock, Proprietary Brand Names

Note: Proprietary products may have slightly different ingredients or characteristics. Please check with manufacturer.

HAZARDOUS INGREDIENTS

Principal Hazardous Component (Common Name or Chemical)	Quantity (Percent)	Unit	ACGIH TLV		OSHA PEL ¹	
			TWA	STEL	TWA	STEL
Wood	85 - 97					
Softwood or Hardwood Total Dust		(mg/m ³)			15 ²	10 ³
Wood Dust - Not Preservative Treated:						
Inhalable - Western Red Cedar		(mg/m ³)	0.5	none		
Inhalable - All Other Species		(mg/m ³)	1	none		
Resin Solids:						
- Phenol Formaldehyde ⁴	0 - 15	ppm	0.3 ⁵	none	0.75	2
- Polymeric Diphenylmethane Diisocyanate ⁶	0 - 15	ppm	none	none	none	none
Paraffin Wax	0 - 2	(mg/m ³)	2	none	2	none

- Notes:
1. Values for State PEL (or Province OEL) may be more restrictive.
 2. Respirable fraction is limited to 5 mg/m³.
 3. Recommended exposure limits based on 1989 OSHA PELs: TWA 5 mg/m³ and STEL 10 mg/m³ for all softwoods and hardwoods, except western red cedar; TWA 2.5 mg/m³ for western red cedar.
 4. Product contains less than 0.05% free formaldehyde (CAS RN 50-00-0). Phenol formaldehyde resin is used in the surface material and/or centre material.
 5. Ceiling value.
 6. This ingredient is the polymerized form of MDI binder (CAS RN 101-68-8). There are no detectable MDI monomers in the product as purchased. MDI binder is generally used in the centre material only.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling point (degrees Centigrade)	n/a
Specific gravity (water = 1.0)	0.5 - 0.7
Percent volatile (by volume)	0
Evaporation rate	n/a
Vapour pressure (mm of Hg)	n/a
Vapour density	n/a
Solubility in Water (% by weight)	< 0.1%

Appearance and Odour - brown panel consisting of a ligno-cellulosic matrix of interlocking wood fibres with slight aromatic odour (stronger when wet). The wood component may consist of the following species: alder, aspen, beech, birch, cottonwood, eastern red cedar, fir, gum, hemlock, hickory, maple, oak, pecan, pine, poplar, spruce, yellow cypress, walnut, and/or western red cedar.

FIRE AND EXPLOSION DATA

Flashpoint	n/a
Flammable Limits	Lower n/a Upper n/a
Fire Extinguishing Media	Water, CO ₂ , sand
Auto Ignition Temperature	Variable, typically 400-500 °F (200-260 °C)
NFPA Rating (scale 0-4)	Health =1; Fire=1; Reactivity=0

Normal Fire-Fighting Procedures Equipment:

Determined by surrounding fire. Use a water spray to wet down panels and any dust to prevent ignition. Remove burned material to open area after fire is extinguished.

Usual Fire or Explosion Hazard: Fine panel dust in an airborne concentration greater than 40 g/m³ of air may explode if the dust cloud contacts a source of ignition.

REACTIVITY DATA

It is a stable product, however excess moisture conditions and open flame should be avoided. It is incompatible with oxidizing agents and drying oil. Good housekeeping procedures and routine disposal of panel dust is suggested. When burned it releases carbon monoxide, polycyclic aromatic hydrocarbons, carbon dioxide, aldehydes and other toxic fumes and gases. Hazardous polymerization will not occur.

HEALTH HAZARDS

Sign and Symptoms of Exposure

1. Acute Overexposure: Panel dust may be a mechanical irritant to eyes. Excessive concentration may cause deposit in nasal passages resulting in rhinorrhea, dry cough, wheezing, sinusitis.

2. Chronic Overexposure: Wood dust, depending on species, may cause dermatitis on prolonged, repetitive contact; may cause respiratory sensitisation and/or irritation. Prolonged exposure to wood dust has been reported by some observers to be associated with nasal cancer. IARC classifies wood dust as a Group 1 - carcinogen to humans. This classification is based on IARC's evaluation of increased risk in the occurrence of adeno-carcinomas of the nasal cavities and paranasal sinuses associated with the exposure to wood dust. IARC did not find sufficient evidence to associate cancers of the oropharynx, hypopharynx, lung, lymphatic and hematopoietic systems, stomach, colon, or rectum with exposure to wood dust.

Note: These products are manufactured using a phenol-formaldehyde thermoset resin and/or polyurethane binder. Maximum indoor formaldehyde levels associated with freshly manufactured panels are similar to outdoor background levels in urban areas (less than 0.1 ppm) and levels decrease through time as the panels age.

Medical Conditions Generally Aggravated by Exposure: Individuals with predisposing respiratory disease - asthma, chronic bronchitis - may have difficulty working around airborne particulates including dust.

Product Listed as Carcinogen - Formaldehyde

NTP Yes - Reasonably anticipated to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No - Regulated formaldehyde gas, potential carcinogen for exposures exceeding 0.5 ppm

Formaldehyde has been classified as a known carcinogen or probable carcinogen by NTP, IARC, and OSHA. A working group of IARC has determined that there is sufficient evidence that formaldehyde causes nasopharyngeal cancer in humans, a rare form of cancer in developed countries.

Product Listed as Carcinogen - Wood Dust

NTP Yes - Known to be a human carcinogen

IARC Monographs Yes Group 1 - Carcinogenic to humans

OSHA No

SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved dust respirator recommended under dusty conditions.

Ventilation: Local exhaust- Panel dust should be collected at source, so that exposure limits are met.

Protective Gloves: Leather, cloth or canvas recommended to minimize slivers or irritation when handling.

Eye Protection: Safety glasses or goggles recommended when machining.

Other Protective Clothing or Equipment: Follow good hygiene and housekeeping practices. Clean up areas where dust settles to avoid excessive accumulation of this combustible material. Minimize blowdown or other practices generating high dust concentrations.

EMERGENCY AND FIRST AID PROCEDURES

1. Inhalation: Remove to fresh air. If persistent irritation, severe coughing, breathing difficulties or rash occur, seek medical advice. (Primary route of exposure is inhalation).

2. Eyes: Panel dust may mechanically irritate the eye, resulting in redness or watering. Flush with water to remove dust particles. If irritation persists, seek medical attention.

3. Skin: Various species of wood dust can elicit allergic contact dermatitis in sensitized individuals after repetitive contact. If a rash, or persistent irritation or dermatitis occurs, seek medical advice before working where panel dust is present.

4. Ingestion: n/a

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be taken in Handling and Storage: No special handling precautions are required. Panels are combustible. Keep in cool, dry place away from open flame and other sources of ignition.

Other Precautions: If this product is used in a process which generates dust levels in excess of the allowable exposure limit(s) for wood dust, a NIOSH approved dust respirator and goggles should be worn.

Due to the explosive potential of wood dust when suspended in air, precautions should be taken to prevent sparks or other ignition sources in ventilation systems. Use of totally enclosed motors is recommended (or may be warranted) if process generates excessive levels of wood dust.

Steps to be taken in Case Material is Released or Spilled: Not applicable for product in purchased form. Panel dust may be vacuumed or shovelled for recovery or disposal. Avoid dusting conditions. Provide good ventilation where dusting is possible. Use NIOSH approved dust respirator and goggles where ventilation is not possible.

Waste Disposal Methods: If disposed or discarded in its purchased form, incineration is preferable. Dry land disposal may be acceptable. It is however the user's responsibility to determine at time of disposal whether the product meets federal, state, provincial or local regulations.

GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
C	degree Centigrade
CAS RN	Chemical Abstracts Service Registry Number (American Chemical Society)
F	degree Fahrenheit
IARC	International Agency for Research on Cancer
mg/m ³	milligrams per cubic meter of air
n/a	not applicable
NFPA	National Fire Protection Association (US)
NIOSH	National Institute of Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OEL	occupational exposure limit
OSHA	Occupational Safety and Health Administration (US)
PEL	permissible exposure level
ppm	parts per million in air
STEL	short term exposure limit (15 minutes)
TLV	threshold limit value
TWA	8 hour time weighted average

Important: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. SBA makes no warranty, express or implied, concerning the accuracy or completeness of the information and data herein and will not be liable for claims relating to any party's use of a reliance on the information and data contained herein. It is expected by SBA that the user of this information will confirm its accuracy and completeness with the supplier and/or manufacturer of the oriented strand board or waferboard product being purchased and/or used.

Insulfoam LLC

Material Data Safety Sheet

I. PRODUCT INFORMATION Effective date 6/20/07

Product : Insulfoam Molded EPS Products, R-TECH	Hazard Rating 0 = Minimal 3 = Serious 1 = Slight 4 = Severe 2 = Moderate	Health	0
Synonyms : Molded Expanded Polystyrene (MEPS)		Fire	2
Product Grades : Type I, VIII, II, IX, XIV and XV (modified)		Reactivity	0
Chemical Family : Polystyrene Thermoplastic	Contact:		
CAS Registry No. : 9003536			
CAS Name : Benzene, Ethenyl, Homopolymer			
Formula : (C ₈ H ₈) _n			
TSCA Inventory Status : Listed			
			Insulfoam LLC 1019 Pacific Avenue, Suite 1501 Tacoma, Washington 98402-4483 (253) 572-5111 FAX (253) 383-7100

II. INGREDIENTS

Hazardous Components:	CAS Registry No.:	Approx. Weight Percentage:
Pentane	109660	<2%
Bromine Flame Retardant Polymeric Film	3194-55-6	<1% 1-3%
Non-Hazardous Components:	CAS Registry No.:	Approx. Weight Percentage:
Polystyrene	9003536	>92%

III. PHYSICAL DATA

Form : Rigid, cellular foam blocks, boards and shapes	Specific Gravity (Water = 1) : <1
Color : White	Volatile by Volume : <1.8% (Pentane & Water)
Odor : Very slight pentane	Vapor Pressure : N/A
Boiling Point : N/A	Vapor Density (Air = 1) : N/A
Melting Point : N/A (Softening begins @ 160° F)	Evaporation Rate : None
	Solubility in Water : Insoluble
	Density : 0.6 pcf to 3.0 pcf

IV. FIRE & EXPLOSION DATA

Flash Pt. and Method Used :	610° F min. (ASTM D1929)
Special Fire-Fighting Instructions :	Use approved self-contained breathing apparatus respirator and personal protective clothing (turn out gear).
Extinguishing Media :	Water fog, carbon dioxide, dry chemical, foam
Autoignition Temperature :	850° F min.
Unusual Fire & Explosion Hazards :	If exposed to fire, high heat will develop and may produce dense, black smoke. Dust generated by fabrication (ie. sanding, sawing, etc.) will increase fire hazard and should be handled accordingly.

V. REACTIVITY DATA

Stability (Conditions to Avoid) :	Stable. Avoid fire and high temperatures.
Incompatibility (Materials to Avoid) :	Will dissolve in most organic solvents and some insecticides, aldehydes and amines.
Hazardous Decomposition :	CO, CO ₂ , H ₂ O and Hydrogen Bromides
Hazardous Polymerization :	None.

<u>Principal Health Hazards and Signs & Symptoms of Exposure</u>	<u>First Aid</u>
<p>Eye Contact : Dust or particles may cause mechanical eye irritation and/or injury.</p> <p>Inhalation : Dust from mechanical fabrication may cause upper respiratory irritation. Fumes from hot-wire cutting can also cause upper respiratory irritation.</p> <p>Skin Contact : None. May produce slight skin irritation in a few individuals.</p> <p>Ingestion : Biological inert. May act as an obstruction if swallowed.</p> <p>Carcinogenicity : None.</p> <p>Safety Precautions: Use positive ventilation. Mechanical fabrication, sanding, etc. requires the use of safety glasses or goggles and dust mask.</p>	<p>Eyes : Rinse with clean water. Remove foreign particles with clean, lint-free cloth. Obtain medical treatment if pain, blinking, tears or redness persists.</p> <p>Inhalation : If overcome by exposure, remove to fresh air. Provide oxygen and artificial respiration. Get medical attention.</p> <p>Skin : Not expected to present skin hazard. Wash exposed areas with mild soap and water. Consult physician if irritation persists.</p> <p>Ingestion : Not expected to present significant ingestion hazard. Consult physician if swallowed.</p>

VII. EMPLOYEE PROTECTION

Personal Protection Equipment
<p>Respiratory Protection : Use approved dust mask when sawing or sanding.</p> <p>Skin Protection : Wear gloves and/or sleeves if sensitivity is noted.</p> <p>Eye Protection : Use approved safety glasses/goggles when sawing or sanding.</p> <p>General Control Measures : Use positive ventilation. Wear safety glasses/goggles and dust mask if mechanical fabrication is to take place.</p>

VIII. SPILL OR LEAK PROCEDURE

<p>Spill, Leak or Release Procedures : Normal good housekeeping should be observed. Material can be swept or picked up and placed into a suitable container for disposal.</p> <p>Reportable Quantity : None.</p> <p>Disposal Method : Recycle, incinerate (WTE) or land-fill per local and state regulations.</p>
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IX. SPECIAL PRECAUTIONS

<p>Storage and Handling : Expanded Polystyrene is considered to be combustible, and adequate protection from sources of ignition should be taken.</p> <p>Transportation Requirements : Not a D.O.T. Hazardous Material.</p>

The information contained herein is provided as a general reference only. Insulfoam believes the data set forth herein to be accurate and given in good faith. Insulfoam makes no guarantee or warranty and does not assume any liability with respect to the accuracy or completion of such information or of the product results in any specific instance, and hereby expressly disclaims any implied warranties of merchantability or fitness for a particular purpose, or any other warranties or representations whatsoever, expressed or implied.

MSDS 085

INSULFOAM LLC
1019 Pacific Avenue, Suite 1501
Tacoma, Washington 98402-4483

Emergency Telephone Number CHEMTREC 1-800-424-9300 (This number is available days, nights, weekends & holidays.)

INSULFOAM LLC
 TECHINCAL CENTER
 17001 Fish Point Road, Suite 101
 Prior Lake, Minnesota 55372
 (800) 469-8870

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EMERGENCY CONTACTS

Call Chemtrec: USA: 1-800-424-9300
International: (703) 527-3887

SECTION I - PRODUCT AND COMPANY INFORMATION

Product Name: PBS SIPs Mastic

HMIS Hazard Rating: Health: 1 Fire: 3 Reactivity: 0 PPE: B

Company Identification: MADE FOR
Premier Building Systems
4609 70th Avenue East
Fife, WA 98424
USA

SECTION II - INGREDIENT AND HAZARD INFORMATION

Ingredient Name	CAS Number	Percent	TSCA
Light Hydrotreated Naphtha	64742-49-0	15 to 25	Y

Ingredient Notes:

Remaining ingredients are not considered OSHA hazardous.

SECTION III - PHYSICAL AND CHEMICAL PROPERTIES

Form:	Non-sag mastic
Solubility (in water):	Insoluble
pH Value, +/- .3:	Not Applicable
Boiling Range:	135 ^o F - 160 ^o F (57.22 ^o C - 71.11 ^o C)
Vapor Pressure (mmHg):	Over 98 @ 68 ^o F (20 ^o C)
Evaporation Rate:	4.4 times faster than n-Butyl Acetate
Vapor Density:	Heavier than air
% Volatile, Weight:	Approximately 20%
% Volatile, Volume:	Approximately 40%
Specific Gravity:	1.34339
VOC (less H ₂ O or exempt):	300 g/l (20%)

NOTE :

BOILING RANGE, EVAPAPORATION RATE, VAPOR DENSITY AND PRESSURE ARE FOR SOLVENT ONLY!

SECTION IV - FIRE FIGHTING MEASURES

Flammability Class: IB
Flash Point: Approximately 0^o F to 5^o F (-17.78^o C to -15^o C)
Tag Closed Cup

Explosive Range (LEL/UEL): 1.0% to 6.7%

EXTINGUISHING MEDIA:

Carbon Dioxide---Dry Chemical---Foam

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Use water fog to cool material in vicinity of fire.

SPECIAL FIRE-FIGHTING PROCEDURES:

Use self-contained breathing apparatus with full face piece operated in pressure demand with full protective equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Any closed container may rupture when exposed to extreme heat. Solvent vapors are heavier than air and travel along the ground. Vapors given off are flammable and may be ignited in air explosively.

SECTION V - HEALTH HAZARD DATA

ROUTES OF ENTRY:

ENTRY THROUGH: Inhalation? YES Skin? YES Ingestion? YES

Contains N-Hexane (110-54-3) in trace quantities which can cause peripheral neuropathy and nervous system damage.

CARCINOGENICITY:

NTP? N/E IARC Monographs? N/E OHSAs? NO

EFFECTS OF OVEREXPOSURE:

Eyes: Can cause irritation, redness, tearing and blurred vision.

Skin: Prolonged or repeated contact can cause moderate irritation, drying of the skin, and dermatitis.

Inhalation: Excessive inhalation of vapors can cause respiratory irritation, headache, drowsiness and fatigue. High concentrations of vapors are anesthetic and may cause central nervous system effects such as dizziness.

Ingestion: Can cause gastrointestinal irritation, nausea, vomiting and diarrhea.

FIRST AID MEASURES:

Eyes: Flush eyes gently with water for at least 15 minutes lifting eyelids occasionally; get prompt medical attention.

Skin: Wash thoroughly with soap and water; apply a mild skin cream. Remove contaminated clothing.

Inhalation: Move affected person to fresh air; if breathing is difficult, administer oxygen; if breathing has stopped, give artificial respiration. Get medical attention.

Ingestion: DO NOT INDUCE VOMITING! Get immediate medical attention

CHRONIC HAZARDS:

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain, nervous system, liver or kidney damage or may cause cardiac arrhythmia. INTENTIONAL misuse of this product by deliberately inhaling its vapors may be harmful or fatal.

SECTION VI - STABILITY AND REACTIVITY

Stability: Product is stable under normal storage conditions

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Hazardous Polymerization: Will not occur under normal conditions

INCOMPATIBILITY:

Keep away from strong oxidizing agents.

CONDITIONS TO AVOID:

Keep away from heat, spark, open flames and any ignition source.

HAZARDOUS DECOMPOSITION PRODUCTS:

Will produce fumes and smoke containing carbon monoxide and dioxide under fire conditions.

SECTION VII - ACCIDENTAL RELEASE AND DISPOSAL MEASURES

STEPS TO BE TAKEN IN CASE OF SPILL:

Eliminate all ignition sources. Ventilate confined areas. Open windows and doors. Wear appropriate protective clothing. Cover with absorbent. Scoop material into a sealable safety container.

WASTE DISPOSAL METHOD:

Dispose of following local, state, and federal regulations.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

ACGIH TLV	ACGIH TLV-C	ACGIH STEL	OSHA STEL	OSHA PEL
Light Hydrotreated Naphtha				
500.00 PPM	N/est	N/est	1000.00 PPM	500.00 PPM

RESPIRATORY PROTECTION:

If TLV of the product is exceeded, a NIOSH/MSHA jointly approved air supply respirator is advised in the absence of proper ventilation. OSHA regulations also permit the use of other types of NIOSH/MSHA respirators under specified conditions. See your safety equipment supplier for more information.

VENTILATION:

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV. Ventilate during application and curing of this product.

PROTECTIVE CLOTHING:

Rubber gloves should be worn where skin contact is likely. Wear impervious clothing and shoes.

EYE PROTECTION:

Chemical goggles or safety glasses should be worn.

HANDLING AND STORAGE PRECAUTIONS:

Keep away from heat, spark and flame.
Keep out of reach of children.
Keep container closed while not in use.
Do not cut or burn receptacles that have contained a solvent based product.
Do not reuse this container.
Use only in a well ventilated area.

N/A=NOT APPLICABLE

N/AV=NOT AVAILABLE

N/E, N/est = NOT ESTABLISHED

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SECTION IX - TRANSPORT INFORMATION

GROUND TRANSPORT (DOT) - DOMESTIC:

Units less than 5L (1.3 gallons liquid) i.e. 10oz, 28oz
Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM - D
DOT Label Required: ORM-D
Shipping Document: CONSUMER COMMODITY, ORM-D
ERG Code: 171

AIR TRANSPORT (DOT) - DOMESTIC:

Units less than 5L (1.3 gallons liquid) i.e. 10oz, 28oz
Proper Shipping Name: CONSUMER COMMODITY
Classification: ORM-D
DOT Label Required: ORM-D-AIR
Shipping Document: Consumer Commodity, ORM-D
ERG Code: 171

AIR TRANSPORT (IATA) - INTERNATIONAL:

Units less than 5L (1.3 gallons liquid) i.e. 10oz, 28oz,
Proper Shipping Name: CONSUMER COMMODITY
Classification: Class 9
Label Required: ID8000
Shipping Document: Consumer Commodity, 9, ID8000
ERG Code: 9L

MARINE - OCEAN TRANSPORT (IMDG):

Units less than 5L (1.3 gallons liquid) i.e. 10oz, 28oz
Proper Shipping Name: ADHESIVE
Classification: Class 3
Label Required: Flammable Liquid, UN1133, Class 3, Ltd. Qty.
(on Ocean container only, not required on cartons)
Shipping Document: ADHESIVE, 3, UN1133, PG 111, LTD.QTY.
EMS Code: F-E, S-D

SECTION X - REGULATORY INFORMATION

SARA Section 311/312 Hazard Categories met: Fire Hazard, Immediate (Acute) and
Delayed (Chronic) Health Hazards.
Chemical ingredients are listed on the TSCA inventory.
SARA Section 313 toxic chemicals: NONE above the de minimis reporting
thresholds.
California PROP.65 Chemicals: none known

DISCLAIMER:

The information contained herein is based on data available as of the date of preparation of this MSDS and which we believe to be reliable. However, no warranty is expressed or implied regarding the accuracy of the data. We shall not be responsible for the use of this information, or of any product, method, apparatus mentioned, and user must make his own investigation to determine the suitability of the information or products for his particular purpose, for the protection of the environment, and the health & safety of the users of this material

EMERGENCY CONTACTS

Call Chemtrec: USA: 1-800-424-9300
International: (703) 527-3887

Section 1. Product and Company Information (MADE FOR)

Product Name	PBS Zero VOC SIPs Mastic	Premier Building Systems 4609 70 th Avenue East Fife, WA 98424 U.S.A. Tel: 253-926-2020
Family	Silyl terminated polyether	
Product Use	Moisture cure mastic	
MSDS Prepared	12/11/08	

Section 2. Composition / Information on Ingredients**HAZARDOUS INGREDIENTS**

<u>Ingredient Name</u>	<u>CAS Number</u>	<u>Concentration</u>
Amino Silane VOC	1760-24-3	1 – 5% 0 g/l

Section 3. Hazards Identification**EMERGENCY OVERVIEW**Human Effects and Symptoms of Exposure

Routes of Entry – Dermal contact, Eye.
Acute Eye Contact – Direct contact can cause severe irritation.
Acute Skin Contact – Direct contact may cause slight irritation.
Skin Absorption – Not Toxic.
Acute Inhalation – Product is extremely low in volatility and therefore not likely to pose a problem from inhalation.
Acute Ingestion – May be harmful if ingested, not a likely route of entry.
Chronic Effects of exposure – Repeated or prolonged direct contact to the eyes may cause chemical burns. Repeated or prolonged direct contact to the skin may cause a dermatitis.
Medical Conditions Aggravated by exposure – Preexisting skin and eye disorders may be aggravated by direct contact to this product.
Carcinogenicity – There are no components in this product that are listed as a carcinogen by NTP, IARC, ACGIH or OSHA.

HMIG

<u>Health</u>	1
<u>Flammability</u>	0
<u>Reactivity</u>	0
<u>Protective Equipment</u>	B

Section 4. First Aid Measures

First Aid For Eyes – Flush with large amounts of water for at least 15 minutes. Consult a physician if ill effects or irritation occurs.
First Aid For Skin – Clean product from affected area with Ethyl alcohol, then wash with soap and water.
First Aid for Inhalation – An unlikely route of entry. Remove to fresh air. Consult a physician.
First Aid For Ingestion – An unlikely route of entry. Consult a physician.

Section 5. Fire Fighting Measures

Special Fire Fighting Instructions – None. Full emergency equipment with self – contained breathing apparatus and full protective clothing should be worn by firefighters.
Extinguishing Media – Water, CO₂, Dry Chemical, Foam.
Unusual Fire and Explosion Hazards – None. This product is not considered flammable.
Flashpoint – Not applicable.
Upper Flammable Limit – Not applicable.
Lower Flammable Limit – Not applicable.
Autoignition temperature – Not applicable.
Sensitivity to Impact – Not applicable.
Sensitivity to Static Discharge – Not applicable.
Hazardous Combustion Products – Thermal decomposition may produce toxic fumes of Carbon Monoxide and/or Carbon dioxide.

Section 6. Accidental release measures

Personal Precautions – Use personal protection recommended in section 8.
Methods For Cleaning Up – Collect spill with absorbent material such as cardboard and place into a container approved for waste disposal.

Section 7. Handling and Storage

Handling – Use personal protection recommended in section 8. Avoid eye, skin and clothing contact.
Storage – Store in a cool dry area (this product polymerizes when in contact with moisture.)

Section 8. Exposure Controls / Personal Protection

Exposure Guidelines – No established limits.
Engineering controls – No specific controls are needed.
Personal Protective Equipment:
 Eye Protection – Wear safety glasses or goggles to avoid eye contact.
 Skin Protection – Wear impervious gloves such as vinyl to minimize contact with skin.
 Respiratory Protection – Not required.
 Work/Hygienic Practices – Avoid contact with eyes and skin. Wash thoroughly after handling and before eating or drinking.

Section 9. Physical and Chemical Properties

Physical State	Paste.(reacts with moisture to become a firm synthetic rubber)
Odor and appearance	Mild ester odor, thick paste, orange color.
pH	Not established.
Specific Gravity	Heavier than water.
Bulk Density	~ 13.35 lbs/gal.
Vapor Density (air = 1)	> 1
Vapor Pressure (mmHg)	Not established.
Evaporation Rate	Not Applicable.

Section 9. Physical and Chemical Properties (continued)

Boiling Point.....Not established.
Freezing Point.....Not established.
Coefficient of Water/Oil Distribution...Not established
Viscosity.....~ 800,000 cP

Section 10. Stability and Reactivity

Stability – Considered Stable.
Conditions to Avoid – None known
Incompatible Materials – None known.
Hazardous Decomposition Products – None known.
Hazardous polymerization – Will not occur.
Reactivity – Hazardous reaction will not occur.

Section 11. Toxicological Information

Information below is based on Amino Silane (refer to sections 2.and 3.)

Oral – Result: LD50 > 2,000 mg/kg. Remark: Very low order of toxicity.
Skin Absorption – Result: LD50 > 2,000 mg/kg. Remark: Very low order of toxicity.
Skin Direct contact – Result: Slight irritation.
Eye Direct contact – Result: Severe irritation. Remark: Causes corneal injury.
Inhalation – Result: LC50 Not acutely Toxic.
Exposure Limits – Not applicable.
Sensitization – No.
Reproductive Toxicity – No.
Mutagenicity – No.
Teratogenicity – No
Synergistic Products – None.

Section 12. Ecological Information

No known applicable information.

Section 13. Disposal Considerations

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
This product becomes a firm synthetic rubber when cured. Please allow to cure before disposal.

Section 14. Transport Information

Special Shipping Information – None.
DOT – Not regulated.
TDG – Not available.
PIN – Not available.

Section 15. Regulatory Information

OSHA 29 CFR 1910-1200 – Irritant.

TSCA – All components of this product are listed on TSCA Inventory.

CERCLA Reportable Quantity – Not applicable.

SARA Title III:

Section 302 Extremely Hazardous Substances – None.

Section 304 – Not applicable.

Section 311/312 – Immediate (acute) health hazard.

Section 313 – None.

RCRA – Refer to section 13.

California Proposition 65 – This product contains no levels of listed substances which the state of California has found to cause cancer, birth defects or other reproductive harm.

WHIMS Classification – D2B

Section 16. Other Information

Prepared in accordance with 29 CFR 1910.1200

This Product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

To the best of our knowledge, the information contained herein is accurate. However Premier Building Systems does not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be handled with care. Although we have described herein all of the hazards to which we are currently aware, we cannot guarantee that these are the only hazards which exist.

EMERGENCY CONTACTS

Call Chemtrec: USA: 1-800-424-9300
International: (703) 527-3887

Section 1. Product and Company Information

Product Name	Air Barrier	CHEM LINK Services LLC 353 E. Lyons Street Schoolcraft, MI 49087 U.S.A.
Chemical Family	Silyl terminated polyether	
Product Use	Moisture cure adhesive	
MSDS Prepared	10/20/11	Tel: 269-679-4440
MSDS Prepared by	James Larke	Fax: 269-679-4448

Section 2. Composition / Information on Ingredients**HAZARDOUS INGREDIENTS**

<u>Ingredient Name</u>	<u>CAS Number</u>	<u>Concentration</u>
Amino Silane	1760-24-3	1 – 5%

Section 3. Hazards Identification**HMIG****EMERGENCY OVERVIEW**Human Effects and Symptoms of Exposure

<u>Health</u>	1
<u>Flammability</u>	0
<u>Reactivity</u>	0
<u>Protective</u>	
<u>Equipment</u>	B

Routes of Entry – Dermal contact, Eye.

Acute Eye Contact – Direct contact can cause severe irritation.

Acute Skin Contact – Direct contact may cause slight irritation.

Skin Absorption – Not Toxic.

Acute Inhalation – Product is extremely low in volatility and therefore not likely to pose a problem from inhalation.

Acute Ingestion – May be harmful if ingested, not a likely route of entry.

Chronic Effects of exposure – Repeated or prolonged direct contact to the eyes may cause chemical burns. Repeated or prolonged direct contact to the skin may cause a dermatitis.

Medical Conditions Aggravated by exposure – Preexisting skin and eye disorders may be aggravated by direct contact to this product.

Carcinogenicity – There are no components in this product that are listed as a carcinogen by NTP, IARC, ACGIH or OSHA.

Section 4. First Aid Measures

First Aid For Eyes – Flush with large amounts of water for at least 15 minutes. Consult a physician if ill effects or irritation occurs.

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Special Fire Fighting Instructions – None. Full emergency equipment with self - contained breathing apparatus and full protective clothing should be worn by firefighters.
 Extinguishing Media – Water, CO₂, Dry Chemical, Foam.
 Unusual Fire and Explosion Hazards – None. This product is not considered flammable.
 Flashpoint – Not applicable.
 Upper Flammable Limit – Not applicable.
 Lower Flammable Limit – Not applicable.
 Autoignition temperature – Not applicable.
 Sensitivity to Impact – Not applicable.
 Sensitivity to Static Discharge – Not applicable.
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 Storage – Store in a cool dry area (this product polymerizes when in contact with moisture.)

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 Engineering controls – No specific controls are needed.
 Personal Protective Equipment:
 Eye Protection – Wear safety glasses or goggles to avoid eye contact.
 Skin Protection – Wear impervious gloves such as vinyl to minimize contact with skin.
 Respiratory Protection – Not required.
 Work/Hygienic Practices – Avoid contact with eyes and skin. Wash thoroughly after handling and before eating or drinking.

Section 9. Physical and Chemical Properties

Physical State.....Paste. (reacts with moisture to become a firm synthetic rubber adhesive)
 Odor and appearanceMild ester odor, paste, light green color.
 pH.....Not established.
 Specific Gravity..... Heavier than water.
 Vapor Density (air = 1).....> 1
 Vapor Pressure (mmHg).....Not established.
 Evaporation Rate.....Not Applicable.

Section 9. Physical and Chemical Properties (continued)

Boiling Point.....Not established.

Freezing Point.....Not established.

Coefficient of Water/Oil Distribution...Not established

Section 10. Stability and Reactivity

Stability – Considered Stable.

Conditions to Avoid – None known

Incompatible Materials – None known.

Hazardous Decomposition Products – None known.

Hazardous polymerization – Will not occur.

Reactivity – Hazardous reaction will not occur.

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Oral – Result: LD50 > 2,000 mg/kg. Remark: Very low order of toxicity.

Skin Absorption – Result: LD50 > 2,000 mg/kg. Remark: Very low order of toxicity.

Skin Direct contact – Result: Slight irritation.

Eye Direct contact – Result: Severe irritation. Remark: Causes corneal injury.

Inhalation – Result: LC50 Not acutely Toxic.

Exposure Limits – Not applicable.

Sensitization – No.

Reproductive Toxicity – No.

Mutagenicity – No.

Teratogenicity – No

Synergistic Products – None.

Section 12. Ecological Information

No known applicable information.

Section 13. Disposal Considerations

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. This product becomes a firm synthetic rubber when cured. Please allow to cure before disposal.

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DOT – Not regulated.

TDG – Not available.

PIN – Not available.

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