SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

1.1 PRODUCT IDENTIFIER

Product Name: - component A

Product Code:

1.2 RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE

Product Use: Component in low pressure polyurethane foam

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Name/Address:

Telephone Number:

Email:

Website:

1.4 EMERGENCY TELEPHONE NUMBER

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Incident
Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1-703-527-3887 (collect calls accepted)

SECTION 2: HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE CHEMICAL

Hazard class:

HAZARD CLASSIFICATION	CATEGORY
Skin Corrosion/Irritation	2
Eye Damage/Irritation	2B
Sensitization – Respiratory	1
Sensitization – Skin	1
STOT SE – Specific Target Organ Toxicity (Single Exposure)	3
Gases Under Pressure	Compressed Gas

2.2 LABEL ELEMENTS

Hazard pictogram: GHS04, GHS07, GHS08

Signal word: Danger

Hazard statement:
Contains gas under pressure; may explode if heated
Causes skin irritation
May cause an allergic skin reaction
Causes eye irritation
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause respiratory irritation
May cause drowsiness or dizziness

Prevention:
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective eye protection/face protection.
In case of inadequate ventilation, wear respiratory protection.

Response:
Specific treatment (see Section 8 on this label).
If on skin: Wash with plenty of water.
Take off contaminated clothing and wash it before reuse.
If skin irritation or a rash occurs: Get medical advice/attention.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms: Call a poison/doctor.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Storage:
Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight.

Disposal:
Dispose of contents and container in accordance with all local, regional, national and international regulations.

2.3 ADDITIONAL INFORMATION

Main symptoms:
Skin irritation. May cause redness and pain. May cause allergic skin reaction. Dermatitis. Rash. Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. Headache. Nausea. Vomiting. May cause drowsiness or dizziness. Difficulty breathing. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Lung damage and respiratory sensitization may be permanent.

Hazards not otherwise specified:
Norflurane vapors may cause drowsiness or dizziness. Excessive exposure can lead to unconsciousness or asphyxiation. System is pressurized. Contains gas under pressure; may explode if heated. Store at temperatures not exceeding 120°F (48°C). In excessive temperatures, the burst plug may burst, releasing Norflurane and other chemicals contained in the product.

1.0% of the mixture consists of ingredient(s) of unknown acute toxicity

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 MIXTURES

Material	CAS No.	Weight %*
Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9	30-60%
4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8	30-60%
Norflurane	811-97-2	5-10%

*The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

SECTION 4: FIRST-AID MEASURES

4.1 DESCRIPTION OF THE FIRST AID MEASURES

General information: If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. The reaction of polyols and isocyanates generate heat. Contact of the reaction materials with skin or eyes can cause severe burns and may be difficult to remove from the affected areas. Immediately wash the affected areas with plenty of water and seek medical assistance.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison center immediately.

Skin contact: Wash with plenty of soap and water. If skin irritation occurs, get medical advice/attention. In case of eczema or other skin disorders: Seek medical attention and bring along these instructions. Take off contaminated clothing and wash 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. Suitable emergency safety shower facility should be available in work area.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion: If swallowed, do not induce vomiting. Get medical attention immediately. The hazard of aspirating material into the lungs is greater than the hazard associated with allowing material to progress through the intestinal tract.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Skin irritation. May cause redness and pain.
May cause allergic skin reaction. Dermatitis. Rash.
Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort.
May cause respiratory irritation
May cause drowsiness or dizziness
Difficulty breathing. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Norflurane vapors may cause drowsiness or dizziness. Excessive exposure can lead to unconsciousness or asphyxiation.

Skin contact with MDI can cause discoloration. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath, and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g. fever, chills) has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENTS NEEDED

Note to physicians: 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. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision.
Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn.
Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound.
Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

Specific treatments: In case of accident or if you feel unwell, seek medical advice (show the label or SDS where possible).

SECTION 5: FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

General hazards: During fire, gases hazardous to health may be formed. May react explosively even in the absence of air at elevated pressure and/or temperature.

Suitable extinguishing media: Foam, CO2 or dry powder. Water spray may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

Unsuitable extinguishing media: Do not use water jet as an extinguisher as this will spread the fire.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Specific hazards: Contents under pressure. Pressurized container may explode when exposed to heat or flame. During a fire, dense smoke will be produced containing the original material as well as unidentified toxic or irritating compounds. Hazardous combustion products may include, but are not limited to, nitrogen oxides, isocyanates, hydrogen cyanide, carbon monoxide, and carbon dioxide. Sealed container may rupture from gases generated in a fire situation. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the auto-ignition temperatures. This may result in spontaneous combustion.

Products of combustion: May include, and are not limited to: carbon oxides (CO, CO2) nitrogen oxides (NO, NO2 etc.) hydrocarbons, isocyanate vapors, and hydrogen cyanide.

5.3 Special protective equipment and precautions for fire-fighters (PPE)

Special protective equipment for fire-fighters:

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.

Special 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.

During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Immediately contact emergency personnel. Evacuate the area. Keep upwind to avoid inhalation of vapors. Clean-up should only be performed by trained personnel. Keep unauthorized persons away. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Emergency personnel need self-contained breathing equipment. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.

6.2 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING - UP

Methods for containment: Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Contain liquid to prevent contamination of soil, surface water or ground water. Keep out of ditches, sewers, and water supplies. Use appropriate Personal Protective Equipment (PPE).

Methods for cleaning-up: Stop the flow of material, if this is without risk. Dike far ahead of spill for later disposal. Following product recovery, flush area with water. For waste disposal, see Section 13 of the SDS.

If the product is in its solid form: Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely.
If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable adsorbent material. Leave to react for at least 30 minutes. Do NOT absorb onto sawdust or other combustible materials. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapour. Neutralise small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminants are : (percentages by weight or volume) :
Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.
Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

Large spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
Never return spills to original containers for re-use.

Environmental precautions: Contain liquid to prevent contamination of soil, surface water or ground water. Keep out of ditches, sewers, and water supplies.

SECTION 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Safe handling advice:	Observe good industrial hygiene practices. Do not breath vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are NOT adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do NOT breathe smoke and gases created by over heating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do NOT reseal if contamination is suspected.
General hygiene advice:	Ensure that medical personnel are aware of the materials(s) involved, and take precautions to protect themselves.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Safe storage:	Store in a cool, covered, well-ventilated place away from direct sunlight. Keep container tightly closed and store locked up in an upright position. Do not expose to moisture. Do not expose to excessive heat. Do not allow to freeze. Ideal storage temperatures: Minimum: 65°F (18°C) Maximum: 90°F (32°C) Contains gas under pressure; may explode if heated. Store at temperatures not exceeding 120°F (48°C). In excessive temperatures, the burst plug may burst, releasing Norflurane and other chemicals contained in the product.
Specific use:	Component in low pressure polyurethane foam
Technical measures:	No specific recommendations.
Incompatible materials:	Copper, copper alloy, galvanized surfaces, water, amines, strong bases, alcohols. Moisture sensitive. Heat, flames, welding arcs, and atmospheric moisture.
Safe storage:	Store away from incompatible materials. Store in tightly closed containers to prevent moisture contamination. Do NOT reseal if contamination is suspected.
Safe packaging material:	No specific recommendations.
Precautions:	Use personal protective recommended in Section 8 of the SDS.
Safe handling advice:	Observe good industrial hygiene practices.
Suitable storage conditions:	Store away from incompatible materials. Store in tightly closed containers to prevent moisture contamination. Do NOT reseal if contamination is suspected. Store at temperatures not exceeding 120°F (48°C). Do not expose to temperatures exceeding 250°F (121°C).
Handling-technical measures:	No specific recommendations.
Local and general ventilation:	Provide adequate ventilation.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Control parameters: Follow standard monitoring procedures.

Exposure limits:

4,4'-Diphenylmethane Diisocyanate (MDI)

OSHA:
PEL-C ppm: 0.02
PEL-C mg/m3: 0.2
NIOSH:
REL-TWA ppm: 0.005
REL-TWA mg/m3: 0.05
REL-C ppm: 0.02
REL-C mg/m3: 0.2
IDLH mg/m3: 75

8.2 EXPOSURE CONTROLS

Engineering measures to reduce exposure:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Provide sufficient air exchange and/or exhaust in work rooms. In all workplaces or parts of the plant where high concentrations of isocyanate aerosols and/or vapors may be generated (e.g. during pressure release, mold venting or when cleaning mixing heads with an air blast), appropriately located exhaust ventilation must be provided in order to prevent occupational exposure limits from being exceeded. The air should be drawn away from the personnel handling the product. The efficiency of the ventilation system must be monitored regularly because of the possibility of blockage. Atmospheric concentrations should be minimized and kept as low as reasonably practicable below the occupational exposure limit.

8.3 INDIVIDUAL PROTECTIVE MEASURES

General: Use personal protective equipment as required.

Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Lung damage and respiratory sensitization may be permanent.

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history or eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. A

comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear appropriate chemical resistant gloves. Nitrile rubber showed excellent resistance. Butyl rubber, neoprene and PVC are also effective.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment. Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C- (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respiratory such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

Skin and body protection: Wear suitable protective clothing. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Hygiene measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Control parameters: Follow standard monitoring procedures.
Local exhaust should be used to maintain levels below the TLV whenever MDI is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g. ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, and others have developed sampling and analytical methods. These are available through various suppliers. does not supply these sampling methods directly.

Thermal hazards: Wear appropriate thermal protective clothing, when necessary.

Environmental exposure controls: Environmental manager must be informed of all major releases.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Brown liquid
Color:	Brown
Form:	Liquid
Odor:	Slightly musty
Odor Threshold:	Well above the exposure limits.
Physical State:	Liquid
pH (at 20°C):	Not available
Melting Point/Freezing Point:	Not available
Initial Boiling Point and Boiling Range:	410°F/210°C @ 5 mmHg
Flash Point:	>400°F/204°C
Evaporation Rate:	Not available
Flammability (solid, gaseous):	Not Flammable
Lower Flammability/Explosive Limit:	Not available
Upper Flammability/Explosive Limit:	Not available
Vapor Pressure:	<1 x 10 (-5) mmHg @ 25°C (77°F)
Vapor Density:	8.5 (air = 1)
Density (lb/gal):	Not available
Relative Density/Specific Gravity:	1.24 @ 20°C
Solubility in water/miscibility:	Reacts with water.
Partition coefficient: n-octanol/water:	Not available
Auto-ignition Temperature:	>1100°F (600°C)
Decomposition Temperature:	Not available
Viscosity (at 20°C) g/L:	Not available
Oxidizing Properties:	Not available
Explosive Properties:	Not available
VOC %:	Not available
Solvent content - Organic:	Not available
Solvent content - Water:	Not available
Solvent content - Solids:	Not available
Other information:	Not available
Incompatibilities:	Copper, copper alloy, galvanized surfaces, water, amines, strong bases, alcohols. Moisture sensitive. Heat, flames, welding arcs, and atmospheric moisture.

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

The product is stable and non-reactive under normal conditions of use, storage and transport. 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.

10.2 CHEMICAL STABILITY

Chemical stability:	Material is stable under normal conditions.
Materials to avoid:	Copper, copper alloy, galvanized surfaces, water, amines, strong bases, alcohols. Moisture sensitive. Heat, flames, welding arcs, and atmospheric moisture.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

Hazardous reactions:	Material reacts slowly with water releasing carbon dioxide. This reaction can cause pressure to build and closed containers to rupture. Elevated temperatures accelerate this reaction. Moisture sensitive. Contact with

moisture, other materials that react with isocyanates may cause polymerizations.

10.4 CONDITIONS TO AVOID Contact with incompatible materials. Heat may cause the cylinders to explode. Avoid heat, sparks, open flames and other ignition sources.

10.5 INCOMPATIBLE MATERIALS Copper, copper alloy, galvanized surfaces, water, amines, strong bases, alcohols. Moisture sensitive. Heat, flames, welding arcs, and atmospheric moisture.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous decomposition products: By fire and high heat: Carbon dioxide (CO2), Carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke, isocyanate, isocyanic acid, other undetermined compounds.

Hazardous polymerization: Moisture sensitive. Contact with moisture, other materials that react with isocyanates may cause polymerizations.

Other information: The reaction of polyols and isocyanates generate heat. Contact of the reaction materials with skin or eyes can cause severe burns and may be difficult to remove from the affected areas. Immediately wash the affected areas with plenty of water and seek medical assistance.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

Acute toxicity: Skin irritation. May cause redness and pain. Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Norflurane vapors may cause drowsiness or dizziness. Excessive exposure can lead to unconsciousness or asphyxiation.

Likely routes of exposure: Skin contact. Eye contact. Inhalation.

Eye: Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort.

Skin: Causes skin irritation. May cause an allergic skin reaction.

Contact with MDI can cause discoloration. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Ingestion: Not an expected route of exposure. Expected to be a low ingestion hazard.

Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled. Excessive exposure by inhalation may cause irritation of the eyes, respiratory tract, and lungs. Norflurane vapors may cause drowsiness or dizziness. Excessive exposure can lead to unconsciousness or asphyxiation.

Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore

throat, coughing, chest discomfort, shortness of breath, and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g. fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

LD50/LC50 values relevant to this classification:

4,4'-Diphenylmethane Diisocyanate (MDI)
Oral rat LD50 >2,000 mg/kg bw
Oral rat LD50 >7,616 mg/kg bw
Oral rat LD50 >10,000 mg/kg bw
Inhal rat LC50 369 mg/m3 air 4hr
Inhal rat LC50 >300 mg/m3 air 4hr
Inhal rat LC50 >2.24 mg/L air 1hr
Inhal rat LC50 0.49 mg/L air 4hr
Derm rabbit LD50 >9,400 mg/kg bw

Calculated overall chemical acute toxicity values for this formulation:

Calculated overall Chemical Acute Toxicity Values		
LC50 (inhalation)	**LD50 (oral)**	**LD50 (dermal)**
>5 mg/kg (dust and mist)	>10,000 mg/kg	>2000 mg/kg

11.2 DELAYED, IMMEDIATE, AND CHRONIC EFFECTS OF SHORT- AND LONG-TERM EXPOSURE

Skin corrosion/irritation: Causes skin irritation. May cause an allergic skin reaction.

Serious eye damage/irritation: Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort.

Respiratory sensitization: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitization: May cause an allergic skin reaction.

Symptoms and target organs: Skin irritation. May cause redness and pain. May cause allergic skin reaction. Dermatitis. Rash. Causes eye irritation. Exposed individuals may experience eye tearing, redness, and discomfort. May cause respiratory irritation. Difficulty breathing. Norflurane vapors may cause drowsiness or dizziness. Excessive exposure can lead to unconsciousness or asphyxiation.

Chronic health effects: No chronic health effects known.

Carcinogenicity: This preparation does not contain a component that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicological Program).
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.

Mutagenicity: No data available to indicate product or any components present at

greater than 0.1% are mutagenic or genotoxic.

Reproductive Toxicity: This product is not expected to cause reproductive or developmental effects.

Specific Target Organ Toxicity (STOT):

Single Exposure: May cause respiratory irritation. May cause drowsiness or dizziness.

Repeated Exposure: Not classified as an STOT - Repeated Exposure.

Aspiration Toxicity: Based on available data, this product is not expected to cause aspiration toxicity.

Other Information: Not available.

SECTION 12: ECOLOGICAL INFORMATION

12.1 ECOTOXICITY

Acute/Chronic toxicity: Based on information for MDI and polymeric MDI. The ecotoxicity measurement 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 >100mg/L in the most sensitive species). The LC50 for earthworm eisenia foetida is >1000 mg/kg.

Aquatic toxicity: In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polymers 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.

Environmental effects: The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

12.2 PERSISTENCE AND DEGRADABILITY

Persistence/biodegradability: The product contains substances which are not expected to be readily biodegradable.
0%, exposure time: 28d, i.e. not readily degradable

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: Oncorhynchus mykiss (rainbow trout), exposure time: 112 d, <1 BCF
i.e. does not bioaccumulate

12.4 MOBILITY

Mobility: Movement is expected to be limited by the product's reactivity with water, forming predominantly insoluble polymers.

12.5 OTHER ADVERSE EFFECTS

Ozone layer: No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Disposal method: Procedure for handling empty or partially used disposable cylinders: GacoFlashFoam is best disposed of as solid material as opposed to the liquid chemicals. To that end, we recommend the following:

Empty remaining chemicals, if any, into a waste container. Make sure that the waste container contains both "A" and "B" chemicals. They do not have to be on ratio, but they both must be present. Mix the waste chemical blend with a stick so that it becomes a solid substance. This substance can then be disposed of as solid industrial waste.

VENTING OF THE TANKS: Turn the tanks upside down. Open tank valves. Leave in this position for 24 hours. Any remaining pressure should be evacuated from the tanks within this period of time.

If only one of the chemicals remains within the container, the chemical must be absorbed and possibly neutralized before disposal.

For "A" chemical remaining, follow this procedure: Always wear respiratory protection. After venting tanks, empty "A" chemical into a waste container. Absorb chemical with a dry oil-absorbent material (for example sawdust or vermiculite). Remove to an outdoor or extremely well ventilated area. Decontaminate with solution of 90-95 parts water, 2–8 parts aqueous ammonia solution and .03-.05 parts liquid detergent. Be sure to add 10%-20% of this decontamination solution to the absorbed chemical. DO NOT SEAL THE CONTAINER. Allow to stand for 72 to 96 hours. Dispose of as solid industrial waste.

Contaminated packaging: Containers may contain residue and should be treated with the same considerations as the product itself. Dispose of vented empty tanks as ordinary industrial waste. Check with your City Department of Public Works for more information.

EU codes: The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Residual waste: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. The preferred option for disposal is sending waste to a licensed and permitted recycler, reclaimer, incinerator, or other thermal destruction device. All disposal methods must be in compliance with local, state, national, and international regulations. Compliance with these regulations is the sole responsibility of the waste generator.

` HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION.

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents and container in accordance with all local, regional, national and international regulations.

Waste codes: The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Other disposal recommendations: Contains gas under pressure; may explode if heated. Store at temperatures not exceeding 120°F (48°C). In excessive temperatures, the burst plug may burst, releasing Norflurane and other chemicals contained in the product.

SECTION 14: TRANSPORT INFORMATION

DOT Non-Bulk

UN: UN3500
Proper shipping name: Chemical under pressure, n.o.s. (Nitrogen)
Hazard class: 2.2 **Packing group:** N/A

DOT Bulk

UN: UN3500
Proper shipping name: Chemical under pressure, n.o.s. (Nitrogen)
Hazard class: 2.2 **Packing group:** N/A

IMDG

UN: UN3500
Proper shipping name: Chemical under pressure, n.o.s. (Nitrogen)
Hazard class: 2.2 **Packing group:** N/A

ICAO/IATA

UN: UN3500
Proper shipping name: Chemical under pressure, n.o.s. (Nitrogen)
Hazard class: 2.2 **Packing group:** N/A

Reportable Quantity:

4,4'-Diphenylmethane Diisocyanate (MDI) RQ: 5,040 kg (11,111 lbs)

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

SECTION 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/ LEGISLATIONS SPECIFIC FOR THE CHEMICAL

US Federal Regulations:

U.S. OSHA (Occupational Safety and Health Administration) Specifically Regulated Substances (29 CFR 1910.1001-1050)

No components of this product are present at concentration greater than or equal to 0.1% and are identified as a carcinogen or potential carcinogen by OSHA.

SARA/CERCLA reporting requirements:

The following components of this product are found at concentrations greater than or equal to 0.1% and are subject to SARA/CERCLA reporting requirements.

Material	SARA 302 (EHSs) TPQ	SARA 304 EHSs RQ	CERCLA RQ	SARA 313 listed	RCRA CODE	CAA 112(r) TQ
Polymeric Diphenylmethane Diisocyanate (pMDI)	Not listed	Not listed	Not listed	313	Not listed	Not listed
4,4'-Diphenylmethane Diisocyanate (MDI)	Not listed	Not listed	5,000	X	Not listed	Not listed

State Right-to-Know Regulations

The following components of this product are found at concentrations greater than or equal to 0.1%, subject to state Right-to-Know reporting requirements; or are found at any concentration and are listed under California Proposition 65.

Material	California Proposition 65	Massachusetts Right-to-Know	Minnesota Employee Right-to-Know	New Jersey Community Environmental Hazard Right-to-Know	New Jersey Right-to-Know Substance	Pennsylvania Right-to-Know	Rhode Island Right-to-Know
Polymeric Diphenylmethane Diisocyanate (pMDI)	Not listed	Listed	Not listed	Listed	Listed	Listed	Listed
4,4'-Diphenylmethane Diisocyanate (MDI)	Not listed	Listed	Listed	Listed	Listed	Listed	Listed

Global Inventories:

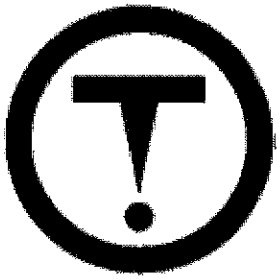
Notification status:	
US - TSCA	All substances are listed
Canada -DSL	All substances are listed
Canada - NDSL	No substances are listed
EU - EINECS	All substances are listed
EU - ELINCS	No substances are listed
EU - NLP	No substances are listed
Australia – AICS	All substances are listed
China - EICSC	All substances are listed
Japan - ENCS	All substances are listed
Korea - KECI	All substances are listed
Taiwan - NECI	All substances are listed
New Zealand - NZIoC	All substances are listed
Philippine - PICCS	All substances are listed

EU - REACH Status:

A registration number is not available for substances in this mixture as the substances are exempted from registration, the annual tonnage does not require a registration or the registration is envisioned for a later registration deadline.

CANADA – WHMIS (Workplace Hazardous Materials Information System) Classification:

D2A, D2B



MEXICO:

Hazard Classification: 2-1-1
Carcinogen Status: Not known

SECTION 16: OTHER INFORMATION

HMIS (Hazardous Materials Identification System) rating:

Health:	**2***
Flammability:	**1**
Physical:	**1**

NFPA 704 (National Fire Protection Association) rating:

Health	**2**
Fire	**1**
Reactivity	**1**

Legend:

DOT	US Department of Transportation
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods

ACGIH	American Conference of Governmental Industrial Hygienists
NTP	National Toxicology Program
IARC	International Agency for Research on Cancer
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
CAA	Clean Air Act
SARA	Superfund Amendments and Reauthorization Act
EPCRA	Emergency Planning and Community Right-to-Know Act
WHMIS	Workplace Hazardous Materials Information System
EU	European Union
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
TSCA	US Toxic Substances Control Act (TSCA)
DSL	Canada Domestic Substance List (DSL)
NDSL	Canada Non-Domestic Substance List (NDSL)
EINECS	European Inventory of Existing Commercial Chemical Substances (EINECS)
ELINCS	European List of Notified Chemical Substances (ELINCS)
NLP	European list of No-longer Polymers (NLP)
AICS	Australian Inventory of Chemical Substances (AICS)
EICSC	China Existing Chemical Inventory - IECSC
ENCS	Japanese Existing and New Chemical Substances Inventory(ENCS)
KECI	Korea Existing Chemicals Inventory(KECI)
NECI	Taiwan National Existing Chemical Inventory (NECI)
NZIoC	New Zealand Inventory of Chemicals (NZIoC)
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
HMIS	Hazardous Materials Identification System
NFPA	National Fire Protection Association (NFPA)

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Prepared by:

End of Safety Data Sheet