

### Section 1 - Product and Company Identification

Hazard Label WARNING label

#### Company Information

Johns Manville  
Roofing Systems Group  
P.O. Box 5108  
Denver, CO 80127 USA

Telephone: 303-978-2000 8:00AM-5:00PM M-F  
Internet Address: <http://www.jm.com>  
Emergency: 800-424-9300 (Chemtrec, In English)

**Trade Names:** JM Green Two-Part Urethane Insulation Adhesive (Part 1)

### Section 2 - Hazards Identification

#### Emergency Overview

Breathing vapors from this product may cause irritation of the upper respiratory tract, fatigue, weakness, drowsiness, and headache. Allergic or asthma-type reactions may occur following sensitization to isocyanates.

HMIS Ratings: Health = 2\* Fire = 1 Reactivity = 1 \* = Chronic Health Hazard

#### Inhalation

Inhalation at levels above the occupational exposure limit could cause respiratory sensitization and risk of serious damage to the respiratory system. The onset of respiratory symptoms may be delayed for several hours after exposure.

#### Skin

This product is irritating to the skin and may cause sensitization.

#### Ingestion

This product is not intended to be ingested or eaten under normal conditions of use. If ingested, seek medical attention.

#### Eyes

This product is irritating to the eyes and may cause sensitization.

#### Primary Routes of Entry (Exposure)

Inhalation, skin, and eye contact.

#### Target Organs

Skin, eye, lungs, central nervous system (CNS), respiratory system, kidney, liver.

#### Medical Conditions Aggravated by Exposure

Pre-existing respiratory diseases or conditions, especially asthma or chemically-induced asthma. Prior exposure and sensitization to isocyanate, or other chemical sensitizers may cause asthmatic, or allergic reactions.

### Section 3 - Composition/Information on Ingredients

CAS #	Component	Percent
101-68-8	Methylene bis(phenylisocyanate)	35-45
9016-87-9	Polymethylene polyphenylene isocyanate	40-55
26447-40-5	Diphenylmethane diisocyanate (polymeric MDI)	0-10

#### General Product Description

Dark brown liquid with faint aromatic odor.

### Section 4 - First Aid Measures

#### First Aid: Inhalation

If the affected person is having difficulty breathing, administer oxygen or apply artificial respiration and immediately contact a medical professional.

#### First Aid: Skin

Remove contaminated clothing. Wash exposed areas with soap and water. If irritation develops or persists, seek medical attention. Launder contaminated clothing before reuse.

#### First Aid: Ingestion

Product is not intended to be ingested or eaten. If this product is ingested, do not induce vomiting and seek medical attention immediately.

#### First Aid: Eyes

Flush eyes with large amounts of water until irritation subsides. If irritation persists, seek medical attention.

**First Aid: Notes to Physician**

Treatment for inhalation, skin contact, or ingestion should be symptomatic. Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias.

**Section 5 - Fire Fighting Measures****Flash Point:** 220°C/428°F**Upper Flammable Limit (UFL):** Not determined**Auto Ignition:** Not determined**Rate of Burning:** Not determined**General Fire Hazards**

MDI vapor and other gases may be generated by thermal decomposition. At temperatures greater than 160°C/320°F, MDI can polymerize and decompose, causing pressure build-up in closed containers. Temperatures over 49°C/120°F accelerate the reaction of MDI with water, which releases carbon dioxide and makes explosive rupture of closed containers possible.

**Hazardous Combustion Products**

Carbon monoxide, carbon dioxide, halogenated hydrocarbons, nitrogen oxides, and various hydrocarbons.

**Extinguishing Media**

Carbon dioxide (CO<sub>2</sub>), water, water fog, dry chemical.

**Fire Fighting Equipment/Instructions**

Use NIOSH-approved self-contained breathing apparatus operating in the pressure demand mode and full fire fighting protective clothing. Avoid inhalation of vapors.

**Section 6 - Accidental Release Measures****Containment Procedures**

Remove all sources of ignition. Evacuate and ventilate spill area. Dam spill area with sand, earth, or other suitable absorbent. Prevent entry of material into sewers, other water sources, or land areas. Wear full protective clothing and respiratory protection during clean-up as required to maintain exposures below the applicable exposure limit. Shovel absorbed material into containers in well-ventilated area.

MDI in contaminated areas can be neutralized with an ammonia/water solution (80% water, plus 20% non-ionic surfactant, or 90% water, 3-8% ammonia, plus 2% detergent. Use 10 parts neutralizer per one part isocyanate.) Allow containers of neutralized solution to stand, uncovered, for 48 hours to allow carbon dioxide (CO<sub>2</sub>) to escape. Small spills should be allowed to stand at least 15 minutes.

**Clean-Up Procedures**

Place in closable container for disposal.

**Section 7 - Handling and Storage****Handling Procedures**

Use protective equipment as described in Section 8 of this safety data sheet when handling uncontained material. Handle in accordance with good industrial hygiene and safety practices.

**Storage Procedures**

Warehouse storage should be in accordance with package directions, if any. Product should be kept in a cool and dry area in original packaging. Do not freeze.

**Section 8 - Exposure Controls / Personal Protection****Exposure Guidelines****A: General Product Information**

Protective equipment should be provided as necessary to prevent inhalation of vapors, prolonged skin contact, and to keep exposure levels below the applicable exposure limits.

**B: Component Exposure Limits****Methylene bis(phenylisocyanate) (101-68-8)**

ACGIH: 0.005 ppm TWA

OSHA: 0.02 ppm Ceiling; 0.2 mg/m<sup>3</sup> Ceiling**PERSONAL PROTECTIVE EQUIPMENT****Personal Protective Equipment: Eyes/Face**

Safety glasses with side shields or chemical goggles are recommended.

**Personal Protective Equipment: Skin**

Impervious gloves such as nitrile rubber should be used to help prevent excessive skin contact.

**Personal Protective Equipment: Respiratory**

A NIOSH approved respirator must be used if vapor concentrations exceed exposure limits.

**Ventilation**

Local exhaust or general dilution ventilation may be required to maintain exposures below the applicable exposure limits. The need for ventilation systems should be evaluated by a professional industrial hygienist, while the design of specific ventilation systems should be conducted by a professional engineer.

**Personal Protective Equipment: General**

Protective equipment should be provided as necessary to prevent irritation of the throat, eyes, and skin, and to keep exposures below the applicable exposure limits identified in Section 8.

**Section 9 - Physical & Chemical Properties**

<b>Appearance:</b>	Dark brown liquid.	<b>Odor:</b>	faint aromatic odor
<b>Physical State:</b>	liquid	<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	NA	<b>Vapor Density:</b>	NA
<b>Boiling Point:</b>	406°F/208°C at 5 mm Hg	<b>Melting Point:</b>	NA
<b>Solubility (H<sub>2</sub>O):</b>	Reacts with water	<b>Specific Gravity:</b>	1.21 at 25°C
<b>Freezing Point:</b>	NA	<b>Solids Content</b>	Not determined
<b>Evaporation Rate:</b>	Not determined	<b>Percent Volatile:</b>	Not determined
<b>VOC:</b>	None expected - test method ASTM standard D5201-05a		

**Section 10 - Stability & Reactivity Information****Stability**

MDI vapor and other gases may be generated by thermal decomposition. At temperatures greater than 160°C/320°F, MDI can polymerize and decompose, causing pressure build-up in closed containers. Temperatures over 49°C/120°F accelerate the reaction of MDI with water, which releases carbon dioxide. Explosive rupture of closed containers is possible.

**Stability: Conditions to Avoid**

Keep away from ignition sources. Do not freeze. Do not thin.

**Incompatibility**

Strong acids, alkalis, and oxidizing agents

**Hazardous Polymerization**

May occur at elevated temperatures in the presence of alkalis, tertiary amines, and metal compounds.

**Section 11 - Toxicological Information****Acute Toxicity****A: General Product Information**

MDI is an allergic sensitizing agent that may produce wheezing, coughing, shortness of breath, runny nose, sore throat, coughing, and reduced lung function. Effects may be delayed. Eye contact may cause irritation with tearing (watery eyes), reddening, and swelling. Ingestion may produce irritation, and corrosive effects on the digestive system.

**B: Component Analysis - LD50/LC50****Methylene bis(phenylisocyanate) (101-68-8)**

Oral LD50 Rat: 9200 mg/kg

**Polymethylene polyphenylene isocyanate (9016-87-9)**

Inhalation LC50 Rat: 490 mg/m<sup>3</sup>/4H; Oral LD50 Rat: 49 g/kg; Dermal LD50 Rabbit: >9400 mg/kg

**Diphenylmethane diisocyanate (polymeric MDI) (26447-40-5)**

Inhalation LC50 Rat: 0.369 mg/L/4H; Oral LD50 Rat: >7400 mg/kg; Dermal LD50 Rabbit: >6200 mg/kg

**Component Carcinogenicity****Methylene bis(phenylisocyanate) (101-68-8)**

IARC: Group 3 - Not Classifiable (IARC Monograph 71 [1999], Supplement 7 [1987], Monograph 19 [1979])

**Polymethylene polyphenylene isocyanate (9016-87-9)**

IARC: Group 3 - Not Classifiable (IARC Supplement 7 [1987], Monograph 19 [1979])

**Diphenylmethane diisocyanate (polymeric MDI) (26447-40-5)**

IARC: Group 3 - Not Classifiable (IARC Monograph 71 [1999], Supplement 7 [1987], Monograph 19 [1979])

**Chronic Toxicity**

If the material is heated isocyanates, mainly diisopropylphenyl isocyanate may be released. Repeated or prolonged exposure to isocyanates in general may result in isocyanate sensitization (chemical asthma) in some individuals, causing them to react to isocyanate exposure at concentrations below the established exposure limits. Symptoms include chest tightness, wheezing, coughing, and shortness of breath. Effects can be delayed. Overexposure can cause lung damage, including decreased lung function. Prolonged or repeated skin contact may cause irritation leading to dermatitis. Skin sensitization may also occur.

**Teratogenicity**

MDI: In laboratory animals, MDI/polymeric and MDI did not produce birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

**Section 12 - Ecological Information****Ecotoxicity****A: General Product Information**

No data available for this product.

**B: Component Analysis - Ecotoxicity - Aquatic Toxicity****Diphenylmethane diisocyanate (polymeric MDI) (26447-40-5)**

96 Hr EC50 Skeletonema costatum: 3230 mg/L

24 Hr EC50 Daphnia magna: &gt;1000 mg/L

**Section 13 - Disposal Considerations****US EPA Waste Number & Descriptions****A: General Product Information**

This product is not expected to be a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Product characterization after use is recommended to ensure proper disposal under federal and/or state requirements.

**B: Component Waste Numbers**

No EPA Waste Numbers are applicable for this product's components.

**Disposal Instructions**

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

**Section 14 - Transport Information****International Transport Regulations**

These products are not classified as dangerous goods according to international transport regulations.

**Section 15 - Regulatory Information****US Federal Regulations****A: General Product Information**

SARA 311 Status. The following SARA 311 designations apply to this product: Immediate (acute) health hazard. Delayed (chronic) health hazard.

**B: Component Analysis**

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

**Methylene bis(phenylisocyanate) (101-68-8)**

SARA 313: 1.0 % de minimis concentration (listed under Chemical Category N120, Diisocyanates)

CERCLA: 5000 lb final RQ; 2270 kg final RQ

**Polymethylene polyphenylene isocyanate (9016-87-9)**

SARA 313: 1.0 % de minimis concentration (listed under Chemical Category N120, Diisocyanates)

**State Regulations****A: General Product Information**

Other state regulations may apply. Check individual state requirements.

**B: Component Analysis - State**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Methylene bis(phenylisocyanate)	101-68-8	Yes	No	Yes	Yes	Yes	Yes

**A: TSCA Status**

This product and its components are listed on the TSCA 8(b) inventory.

None of the components listed in this product are listed on the TSCA Export Notification 12(b) list.

**B: Component Analysis - Inventory**

Component	CAS #	TSCA	DSL	EINECS
Methylene bis(phenylisocyanate)	101-68-8	Yes	Yes	Yes
Polymethylene polyphenylene isocyanate	9016-87-9	Yes	Yes	No
Diphenylmethane diisocyanate (polymeric MDI)	26447-40-5	Yes	Yes	Yes

**Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Methylene bis(phenylisocyanate)	101-68-8	0.1 %

**WHMIS Classification**

Controlled Product Classification: D2A and D2B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. This SDS contains all the information required by the Controlled Products Regulations.

**Section 16 - Other Information****Other Information**

Prepared for:  
Johns Manville  
Roofing Systems  
P. O. Box 5108  
Denver, CO USA 80217-5108

Prepared by:  
Johns Manville Technical Center  
P.O. Box 625005  
Littleton, CO USA 80162-5005

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

Date	MSDS #	Reason
05/14/08	3158-1.0000	New MSDS for Part 1 of JM Green Two-Part Urethane Insulation Adhesive

End of Sheet 3158

### Section 1 - Product and Company Identification

Hazard Label CAUTION label

#### Company Information

Johns Manville  
Roofing Systems  
P.O. Box 5108  
Denver, CO 80127 USA

Telephone: 303-978-2000 8:00AM-5:00PM M-F  
Internet Address: <http://www.jm.com>  
Emergency: 800-424-9300 (Chemtrec, In English)

Trade Names: JM Green Two-Part Urethane Insulation Adhesive (Part 2)

### Section 2 - Hazards Identification

#### Emergency Overview

HMIS Ratings: Health = 1 Fire = 0 Reactivity = 0

#### Inhalation

Inhalation of vapors or mists may cause irritation of the upper respiratory tract or central nervous system depression.

#### Skin

Not expected under normal conditions of use.

#### Ingestion

This product is not intended to be ingested under normal conditions of use. May be harmful if swallowed. May cause gastrointestinal irritation and disturbances. May cause effects similar to those for inhalation exposure. Aspiration into the lungs may cause lung inflammation and other lung injury.

#### Eyes

Irritation, redness, and burning in eyes may occur.

#### Primary Routes of Entry (Exposure)

Inhalation, skin, and eye contact.

#### Target Organs

Skin, eye, lungs, central nervous system (CNS), respiratory system, kidney, liver.

#### Medical Conditions Aggravated by Exposure

Pre-existing eye, skin, respiratory, central nervous system (CNS), liver and kidney diseases or conditions.

### Section 3 - Composition/Information on Ingredients

CAS #	Component	Percent
9003-11-6	Polyethylene-polypropylene glycol	35-55
111-46-6	Diethylene glycol	<10
25265-71-8	Dipropylene glycol	<10

#### General Product Description

Green liquid with slight sweet odor.

### Section 4 - First Aid Measures

#### First Aid: Inhalation

If the affected person is having difficulty breathing, administer oxygen or apply artificial respiration and immediately contact a medical professional.

#### First Aid: Skin

Remove contaminated clothing. Wash exposed areas with soap and water. If irritation develops or persists, seek medical attention. Launder contaminated clothing before reuse.

#### First Aid: Ingestion

Product is not intended to be ingested or eaten. If this product is ingested, do not induce vomiting and seek medical attention immediately.

#### First Aid: Eyes

Flush eyes with large amounts of water until irritation subsides. If irritation persists, seek medical attention.

**Section 5 - Fire Fighting Measures****Flash Point:** 190.6°C/375.1°F**Upper Flammable Limit (UFL):** Not determined**Auto Ignition:** Not determined**Rate of Burning:** Not determined**Extinguishing Media**Carbon dioxide (CO<sub>2</sub>), water, water fog, dry chemical.**Fire Fighting Equipment/Instructions**

Use NIOSH-approved self-contained breathing apparatus operating in the pressure demand mode and full fire fighting protective clothing. Avoid inhalation of vapors.

**Method Used:** PMCC**Lower Flammable Limit (LFL):** Not determined**Flammability Classification:** Not determined**Section 6 - Accidental Release Measures****Containment Procedures**

Remove all sources of ignition. Evacuate and ventilate spill area. Dam spill area with sand, earth, or other suitable absorbent. Prevent entry of material into sewers, other water sources, or land areas. Wear full protective clothing and respiratory protection during clean-up as required to maintain exposures below the applicable exposure limit. Shovel absorbed material into containers in well-ventilated area.

**Clean-Up Procedures**

Place in closable container for disposal.

**Section 7 - Handling and Storage****Handling Procedures**

Use protective equipment as described in Section 8 of this safety data sheet when handling uncontained material. Handle in accordance with good industrial hygiene and safety practices.

**Storage Procedures**

Warehouse storage should be in accordance with package directions, if any. Product should be kept in a cool and dry area in original packaging. Do not freeze.

**Section 8 - Exposure Controls / Personal Protection****Exposure Guidelines****A: General Product Information**

Protective equipment should be provided as necessary to prevent inhalation of vapors, prolonged skin contact, and to keep exposure levels below the applicable exposure limits.

The Occupational Safety and Health Administration (OSHA) has not adopted specific occupational exposure standards for diethylene glycol. JM has internally adopted a workplace exposure guideline for diethylene glycol (vapor and aerosol) of 10 mg/m<sup>3</sup> based on the American Industrial Hygiene Association's (AIHA) Workplace Environmental Exposure Levels (WEELs) of 10 mg/m<sup>3</sup> TWA.**B: Component Exposure Limits**

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

**PERSONAL PROTECTIVE EQUIPMENT****Personal Protective Equipment: Eyes/Face**

Safety glasses with side shields or chemical goggles are recommended.

**Personal Protective Equipment: Skin**

Impervious gloves such as nitrile rubber should be used to help prevent excessive skin contact.

**Personal Protective Equipment: Respiratory**

A NIOSH approved respirator must be used if vapor concentrations exceed exposure limits.

**Ventilation**

Local exhaust or general dilution ventilation may be required to maintain exposures below the applicable exposure limits. The need for ventilation systems should be evaluated by a professional industrial hygienist, while the design of specific ventilation systems should be conducted by a professional engineer.

**Personal Protective Equipment: General**

Protective equipment should be provided as necessary to prevent irritation of the throat, eyes, and skin, and to keep exposures below the applicable exposure limits identified in Section 8.

**Section 9 - Physical & Chemical Properties**

<b>Appearance:</b>	Green liquid	<b>Odor:</b>	Slight, sweet odor
<b>Physical State:</b>	liquid	<b>pH:</b>	Not determined
<b>Vapor Pressure:</b>	Not determined	<b>Vapor Density:</b>	Not determined
<b>Boiling Point:</b>	Not determined	<b>Melting Point:</b>	Not determined
<b>Solubility (H<sub>2</sub>O):</b>	Slight	<b>Specific Gravity:</b>	1.0
<b>Freezing Point:</b>	Not determined	<b>Solids Content</b>	Not determined
<b>Evaporation Rate:</b>	Not determined	<b>Percent Volatile:</b>	<0.15
<b>VOC:</b>	None expected - test method ASTM standard D5201-05a		

**Section 10 - Stability & Reactivity Information****Stability**

These products are not reactive.

**Hazardous Decomposition**

May form carbon dioxide, carbon monoxide, halogenated hydrocarbons, nitrogen oxides, various hydrocarbons.

**Hazardous Polymerization**

Will not occur.

**Section 11 - Toxicological Information****Acute Toxicity****A: General Product Information**

Vapors from this product may cause eye, respiratory and skin irritation,

**B: Component Analysis - LD50/LC50****Polyethylene-polypropylene glycol (9003-11-6)**

Oral LD50 Rat: 5700 mg/kg

**Dipropylene glycol (25265-71-8)**

Oral LD50 Rat: 13300 mg/kg; Dermal LD50 Rabbit: 20600 mg/kg

**Diethylene glycol (111-46-6)**

Oral LD50 Rat: 12565 mg/kg; Dermal LD50 Rabbit: 11890 mg/kg

**Component Carcinogenicity**

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

**Chronic Toxicity**

Prolonged, excessive exposures to vapors may cause nervous system, kidney and liver damage.

**Section 12 - Ecological Information****Ecotoxicity****A: General Product Information**

No data available for this product.

**B: Component Analysis - Ecotoxicity - Aquatic Toxicity****Dipropylene glycol (25265-71-8)**

24 Hr LC50 Carassius auratus: >5000 mg/L [static]

**Diethylene glycol (111-46-6)**

96 Hr LC50 Pimephales promelas: 75200 mg/L [flow-through]

96 Hr EC50 water flea: 0.3 mg/L [Static]; 48 Hr EC50 Daphnia magna: 84000 mg/L



**Section 13 - Disposal Considerations****US EPA Waste Number & Descriptions****A: General Product Information**

This product is not expected to be a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Product characterization after use is recommended to ensure proper disposal under federal and/or state requirements.

**B: Component Waste Numbers**

No EPA Waste Numbers are applicable for this product's components.

**Disposal Instructions**

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

**Section 14 - Transport Information****International Transport Regulations**

These products are not classified as dangerous goods according to international transport regulations.

**Section 15 - Regulatory Information****US Federal Regulations****A: General Product Information**

SARA 311 Status. The following SARA 311 designations apply to this product: Immediate (acute) health hazard.

**B: Component Analysis**

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

**State Regulations****A: General Product Information**

Other state regulations may apply. Check individual state requirements.

**B: Component Analysis - State**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Dipropylene glycol	25265-71-8	No	No	No	No	No	Yes
Diethylene glycol	111-46-6	No	No	No	Yes	No	Yes

**A: TSCA Status**

This product and its components are listed on the TSCA 8(b) inventory.

None of the components listed in this product are listed on the TSCA Export Notification 12(b) list.

**B: Component Analysis - Inventory**

Component	CAS #	TSCA	DSL	EINECS
Polyethylene-polypropylene glycol	9003-11-6	Yes	Yes	No
Dipropylene glycol	25265-71-8	Yes	Yes	Yes
Diethylene glycol	111-46-6	Yes	Yes	Yes

**Component Analysis - WHMIS IDL**

No components are listed in the WHMIS IDL.

**WHMIS Classification**

Controlled Product Classification: D2A, D2B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. This SDS contains all the information required by the Controlled Products Regulations.

**Section 16 - Other Information****Other Information**

Prepared for:  
Johns Manville  
Roofing Systems  
P. O. Box 5108  
Denver, CO USA 80217-5108

Prepared by:  
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P.O. Box 625005  
Littleton, CO USA 80162-5005

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

<b>Date</b>	<b>MSDS #</b>	<b>Reason</b>
05/14/08	3159-1.0000	New MSDS for JM Green Two-Part Urethane Insulation Adhesive (Part 2)
11/21/08	3159-1.0001	Composition update. Removed ethylene oxide from composition.
12/07/09	3159-1.0002	added "green" to the trade name.

End of Sheet 3159