Material Name: JM SPF 0.5 pcf A Component

Section 1 - Product and Company Identification

Hazard Label WARNING

Company Information
Johns Manville
Insulation Systems
P.O. Box 5108
Denver, CO 80127 USA

Trade Names: JM SPF 0.5 pcf A Component

Use: Part A of a two-component indoor spray foam insulation with 50:50 ratio used to insulate homes, buildings, equipment, etc

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

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>101-68-8</td>
<td>Methylene bis(phenylisocyanate) (MBI or MDI)</td>
<td>35-45</td>
</tr>
<tr>
<td>9016-87-9</td>
<td>Polymethylene polyphenylene isocyanate</td>
<td>50-60</td>
</tr>
<tr>
<td>5873-54-1</td>
<td>Benzene, 1-isocyanato-2-[(4-isocyanatophenyl)methyl]-</td>
<td>1-5</td>
</tr>
</tbody>
</table>

General Product Description
Brown liquid with musty 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
This 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: 388.4°F/198°C  Method Used: ASTM D 93
Upper Flammable Limit (UFL):
Auto Ignition:
Rate of Burning:
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 (CO₂), 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 (CO₂) 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.
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.

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**Section 9 - Physical & Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>brown color</td>
</tr>
<tr>
<td>Physical State</td>
<td>liquid</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>&lt;0.0001 mmHg @ 25°C (77°F)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Approximately 208°C (406.4°F)</td>
</tr>
<tr>
<td>Solubility (H2O)</td>
<td>Reacts with water</td>
</tr>
<tr>
<td>Odor</td>
<td>slightly musty</td>
</tr>
<tr>
<td>pH</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>8.5</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.24 @ 25°C (77°F)</td>
</tr>
</tbody>
</table>

**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) (MBI or MDI) (101-68-8)**
  - Oral LD50 Rat: 9200 mg/kg

- **Polymethylene polyphenylene isocyanate (9016-87-9)**
  - Inhalation LC50 Rat: 490 mg/m3/4H; Oral LD50 Rat:49 g/kg; Dermal LD50 Rabbit:>9400 mg/kg

**Component Carcinogenicity**

- **Methylene bis(phenylisocyanate) (MBI or MDI) (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])
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
No ecotoxicity data are available for this product's components.

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. Single containers less than 5,000 lbs. are not regulated.

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) (MBI or MDI) (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.

This product contains a trace (ppm) amount of phenyl isocyanate (CAS# 103-71-9) and monochlorobenzene (CAS# 108-90-7) as impurities.
B: Component Analysis - State
The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>CA</th>
<th>FL</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene bis(phenylisocyanate) (MBI or MDI)</td>
<td>101-68-8</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Polymethylene polyphenylene isocyanate</td>
<td>9016-87-9</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>EINECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene bis(phenylisocyanate) (MBI or MDI)</td>
<td>101-68-8</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Polymethylene polyphenylene isocyanate</td>
<td>9016-87-9</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Benzene, 1-isocyanato-2-[(4-isocyanatophenyl)methyl]-</td>
<td>5873-54-1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Component Analysis - WHMIS IDL
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Minimum Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene bis(phenylisocyanate) (MBI or MDI)</td>
<td>101-68-8</td>
<td>0.1 %</td>
</tr>
</tbody>
</table>

WHMIS Classification
Controlled Product Classification: D1A, 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
Insulation 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.

<table>
<thead>
<tr>
<th>Date</th>
<th>MSDS #</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/09/10</td>
<td>1093-1.0000</td>
<td>New JM MSDS</td>
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End of Sheet 1093