

# QUADRANT CHEMICAL CORPORATION

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## MATERIAL SAFETY DATA SHEET

ISSUE DATE: 04/14/2011

### PRODUCT IDENTIFICATION

PRODUCT CODE NUMBER: **Spray Foam Insulation Part A**

#### CHEMICAL FAMILY

#### PART A

Polymeric Diphenylmethane Diisocyanate  
( MDI )

Quadrant Chemical urges each customer to study this MSDS carefully to become aware of and understand the hazards associated with the product. Please convey this MSDS to all parties concerned.

#### HAZARD RATING

HEALTH	2	4 = EXTREME
FIRE	1	3 = HIGH
REACTIVITY	1	2 = MODERATE
		1 = SLIGHT
		0 - INSIGNIFICANT

### COMPONENT INFORMATION

#### PROPRIETARY

4,4' Diphenylmethane diisocyanate ( MDI )  
Diphenylmethane diisocyanate ( 2,2;2,4 )  
Polymethylene polyphenyl isocyanate

#### CAS REG NO.

#### AMOUNT (%)

101-68-8  
26447-40-5  
9016-87-9

35 - 45  
1 - 5  
40 - 55

*The specific chemical identity of this material is considered a trade secret. For secure reference only.*

## EMERGENCY RESPONSE INFORMATION

### FIRST AID PROCEDURES

*The health effects noted below are consistent with requirements under (29 CFR 1910.1200).*

#### INHALATION

Move subject to fresh air. Give artificial respiration if breathing has stopped. With any difficulty IMMEDIATELY see a physician. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme Asthmatic reactions may be life threatening.

#### INGESTION

If swallowed, give 2 glasses of water to drink. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person. Careful gastric lavage may be indicated. Do induce vomiting.

#### SKIN CONTACT

Immediately wash affected skin areas thoroughly with soap and water. Remove contaminated clothing and shoes. See a physician if irritation develops or persists. Wash contaminated clothing before reuse.

#### EYE CONTACT

IMMEDIATELY flush eyes with a large amount of water for at least 15 minutes. LIFT UPPER AND LOWER LIDS AND RINSE WELL UNDER THEM. Get medical attention, preferably from an ophthalmologist.

#### Note to Physician

EYES: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision.  
SKIN: This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. If burned, treat as thermal burn.  
INGESTION: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound.  
RESPIRATORY: This compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

**FIRE FIGHTING INFORMATION**Unusual Hazards**Down-wind personnel must be evacuated**

Do not reseal contaminated containers as pressure build-up may rupture them. People who are fighting isocyanate fires must be protected against nitrogen oxide fumes and Isocyanate vapors by wearing positive pressure self-contained breathing apparatus and full protective clothing.

Extinguishing Agents

Use the following extinguishing media when fighting fires with this material:

**- Halon 1211 foam - water spray - carbon dioxide - dry chemical.**

If water is used, it should be used in very large quantity. The reaction with water and hot isocyanate may be vigorous.

Personal Protective Equipment

Wear self-contained breathing apparatus ( pressure-demand MSHA / NIOSH approved or equivalent ) and full protective gear.

Special Procedures

Use water spray to cool closed ( SEALED ) containers exposed to fire and heat to minimize the possibility of rupture. Avoid water contamination in closed containers or confined areas ( CO<sub>2</sub> evolved ). High temperatures in a fire may cause pressure build-up in closed containers. Explosive rupture is possible. Therefore, use cold water to cool fire-exposed containers.

**SPILL OR LEAK HANDLING INFORMATION**Personal Protection

Evacuate area. Properly protected personnel should contain the spill. Wear a MSHA / NIOSH approved (or equivalent) full-facepiece air-purifying respirator. Wear full protective equipment including: gloves and boots, chemical splash goggles and face shield ( ANSI Z-87.1 or approved equivalent ). Do not take clothing home to be laundered. If exposed to material during clean-up operations IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. For further information see the PERSONAL PROTECTION MEASURES Section.

Procedures

Major spill: If temporary control of isocyanate vapor is required a blanket of protein foam (available at most fire departments) maybe placed over the spill. Large quantities may be pumped into closed but not sealed containers.

Minor spill: Absorb isocyanate with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well-ventilated area ( outside ) and treat with neutralizing solution consisting of a mixture of water and 3-8 % concentrated ammonium hydroxide ( or 5-10 % sodium carbonate ). Add about 10 parts of neutralizer per part of isocyanate with mixing. Allow to stand for 48 hours letting CO<sub>2</sub> to escape.

Clean-up: Decontaminate floor using water / ammonia solution with 1-2 % added detergent letting stand over affected area for at least 10 minutes. Cover mops and brooms used foe this with plastic and dispose properly ( often by incineration ).

Transfer liquids and solid diking material to separate suitable containers for recovery or disposal. see WASTE DISPOSAL Section for information regarding the disposal of contained spills.

***CAUTION: Keep spills and cleaning runoffs out of municipal sewers and open bodies of water.***

**HAZARD INFORMATION**

**HEALTH EFFECTS FROM OVEREXPOSURE**

**Acute Inhalation**

Inhalation of vapor or mist can cause the following: MDI vapors or mist at concentrations above the TLV can irritate 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. May cause respiratory sensitization in susceptible individuals. At room temperature, vapors are minimal due to low vapor pressure. If heated, excessive concentrations are attainable that could be hazardous on single exposure. Effects may be delayed. Decreased ventilatory capacity has been associated with similar isocyanates; it is possible that exposure to MDI may cause similar impairment of lung function. Persons with a preexisting, nonspecific bronchial hyperactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills) has been reported. Symptoms can be delayed several hours after exposure.

**Chronic Inhalation**

As a result of previous repeated overexposures or a single large dose, certain individuals develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma attack, could be immediate or delayed (up to several hours). Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for years. Overexposure to isocyanates has been reported to cause lung damage (including decrease in lung function). Sensitization can be temporary or permanent.

**Acute Eye Contact**

Liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However, damage is usually reversible.

**Acute Skin Contact**

Isocyanates react with skin protein and moisture and can cause irritation which may include the following symptoms: reddening, swelling, rash, scaling, blistering, discoloration and may be difficult to remove.

**Chronic Skin Contact**

Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases, skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapors. Animal tests have indicated that respiratory sensitization can result from skin contact with MDI.

**Acute Ingestion**

Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.

**FIRE AND EXPLOSIVE PROPERTIES**

Flash Point COC ..... > 400°F

Autoignition Temperature / U/L explosive limits ... Not Determined

**REACTIVITY INFORMATION**

**Instability** This material is considered stable under specified conditions of storage, shipment and / or use. See STORAGE AND HANDLING INFORMATION Section for specified conditions.

**Hazardous Decomposition Products** CO, benzene, toluene, NOx, HCN & acetaldehyde.

**Hazardous Polymerization** Will not occur under normal conditions. May occur in large masses, reactive contamination, excess water.

**Incompatibility** Avoid contact with strong acids, bases, alcohols and water.

**ACCIDENT PREVENTION INFORMATION**

**COMPONENT EXPOSURE INFORMATION**

Exposure Limit Information

Component	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
<u>MDI</u>	.2	0.05

**PERSONAL PROTECTION MEASURES**

Respiratory Protection

Atmospheric levels should be maintained below the exposure limit. Air-purifying respirators should be equipped with organic vapor cartridges. Concentrations greater than the TLV can occur when MDI is heated or used in a poorly ventilated area. A positive pressure, supplied-air respirator or a self-contained breathing apparatus is recommended.

If sprayed, airborne concentrations greater than the TLV or PEL will require as a minimum an Air Purifying Respirator with an end of service indicator certified by NIOSH or a change out schedule based on objective information or data that will ensure the cartridges are changed out prior to the end of their service life must be developed and implemented. The basis of this change out schedule must be described in a written respirator program. If an Air Purified Respirator is selected, the airborne concentration must be no greater than 10 times the TLV or PEL. The recommended Air Purifying Respirator is an organic vapor/particulate filter combination cartridge ( OV/P100 ).

Eye Protection

Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed. Vapor resistant goggles should be worn when contact lenses are worn.

Hand Protection

The gloves listed below may provide protection against permeation. Gloves of other chemically resistant materials may not provide adequate protection.  
 - butyl rubber  
 - VITON™ (registered Trademark of E.I. Dupont)

Other Protection

Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required.

**FACILITY CONTROL MEASURES**

Ventilation

Local exhaust should be used to maintain levels below the TLV whenever MDI is processed heated or sprayed.

*Refer to the current edition of*

***Industrial Ventilation: A Manual of Recommended Practice***

*published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use and maintenance of exhaust systems.*

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Educate and train employees in the safe use of product. Follow all label instructions.

Monitoring

Isocyanate exposure levels must be monitored. Monitoring of airborne isocyanates in the breathing zone of individuals should become part of the overall employee exposure characterization program. Monitoring techniques have been developed by OSHA.

Medical

Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include preemployment and periodic medical examinations with pulmonary function tests (FEV, FVC as a minimum). Persons with asthmatic type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

**STORAGE AND HANDLING INFORMATION**

**Storage Conditions**

Protect from freezing. Store in a well ventilated area at a temperature of 64-86 °F. Store away from excessive heat (e.g. steam pipes, radiators) and from reactive materials. Keep container tightly closed when not in use. Do not reseal if contamination is suspected. MDI reacts slowly with water to form CO<sub>2</sub> gas. This gas can cause sealed containers to expand and possibly rupture.

**Handling Procedures**

See the PERSONAL PROTECTION MEASURES Section prior to handling. May cause allergic skin reaction. Aspiration may cause lung damage. Do not get in eyes, on skin, on clothing. Do not swallow. Avoid breathing vapor. Use with adequate ventilation. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic 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. Exposure to vapors of heated MDI can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

**Other                    **CONTAINER MAY BE HAZARDOUS WHEN EMPTY.****

Since emptied containers retain product residue (vapors and/or liquid) follow all MSDS and label warnings even after container is emptied. DO NOT cut, drill, grind or weld on or near container.

**SUPPLEMENTAL INFORMATION**

**TYPICAL PHYSICAL PROPERTIES**

Appearance	.....	Brown Liquid
Odor Characteristic	.....	Musty-Aromatic
Specific Gravity (Water = 1)	.....	1.24
Vapor Density (Air = 1)	.....	8.6
Vapor Pressure	.....	<1x10 <sup>-5</sup> mm Hg @ 25 °C
Boiling Point	.....	>200 °C
Solubility in water	.....	Reacts
Percent Volatility	.....	Nil

**TOXICITY INFORMATION**

**Acute Toxicity**

Dermal LD50            Greater than 7,900 mg/kg (Rabbits)            Oral LD50    Greater than 15,800 mg/kg ( Rats )  
 Inhalation LD50      Approximately 370-490 mg/kg (Rabbits) for an aerosol of MDI  
 Eye Effects            Slightly irritating. A maximum primary eye irritation score for polymeric MDI of 12.0/110 (24 hr.) was obtained. This score is fairly typical for a number of MDI products.  
 Skin Effects            Slight to moderate irritant. Primary dermal irritation scores are typically below 3.4/8.0 (Draize).  
 Sensitization            MDI has been shown to produce dermal sensitization in several species (guinea pigs, mice, rabbits and dogs). Intradermal or topical application followed by inhalation challenge have resulted in a respiratory sensitization response in guinea pigs. In addition, there is some evidence to suggest that cross-sensitization between different diisocyanates may occur.

**Chronic Toxicity**

In a chronic inhalation exposure study, rats were exposed to an aerosol of polymeric MDI for 6 hours per day, 5 days per week for a period of two years. The exposure concentrations were 0, 0.2, 1.0 and 6.0 mg/m<sup>3</sup>. Microscopic examination of tissues revealed the effects of irritation in the nasal cavity and lungs in animals exposed to 1.0 and 6.0 mg/m<sup>3</sup>. The NOEL was 0.2 mg/m<sup>3</sup>.

**Carcinogenicity**

The occurrence of pulmonary adenomas (benign tumors) and a single pulmonary adenocarcinoma (malignant tumor) were considered to be related exposure at the high concentration of 6.0 mg/m<sup>3</sup>.

**Waste Disposal**

Under RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixture, process, etc. may render the resulting material hazardous. Product as purchased may be disposed of by incineration. Most states prohibit disposal of liquids in landfills. For waste disposal purposes, this product is not known to be defined or designated as hazardous by current provisions of the Federal (EPA) Resource Conservation and Recovery Act (RCRA, 40CFR261 ). For disposal purposes, waste must be tested in accordance with applicable Federal, state and local regulations where the waste material is generated, treated and/or disposed of to verify the appropriate classification.

**REGULATORY INFORMATION**

**WORKPLACE CLASSIFICATIONS**

This product is considered Hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

**TRANSPORTATION CLASSIFICATIONS**

Not a regulated product per DOT specifications.

**EMERGENCY PLANNING & COMMUNITY RIGHT-TO-KNOW (SARA TITLE 3)**

**Section 311/312 Categorizations (40CFR 370)**

This product is a **Hazardous** chemical under 29CFR 1910.1200, and is categorized as: **A reactive hazard.**  
 An immediate health hazard. **A delayed health hazard.**

**Section 313 Information (40CFR 372)**

Toxic Chemicals  
 4,4'-Diphenylmethane Diisocyanate, CAS # 101-68-8; Upper Bound 45%

**CERCLA INFORMATION (40CFR 302.4)**

This material does not have a component or components with a reportable quantity under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) Title III.

**RCRA INFORMATION**

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. [ Not a RCRA-regulated product. ] (Resource Conservation and Recovery Act, 40 CFR 261.20-24). Not listed in 40 CFR 261.33. See Disposal Section.

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

<b>CAS NUMBER</b>	<b>STATE CODE</b>	
101-68-8	PA1, FL, IL, MA, RI, NJ1, NJ4, CN2	FL = Florida Substance List
26447-40-5	PA3, NJ4	IL = Illinois Toxic Substances List
9016-87-9	PA3, NJ4	MA = Mass. Hazardous Substance List
NJ1 = New Jersey Hazardous Substance List	PA1 = Pennsylvania hazardous Substance List	
NJ4 = New Jersey Other	PA3 = Pennsylvania Non-hazardous present @ 3% more	
RI = Rhode Island List of Designated Substances	CN2 = Canada WHMIS Ingredient Disclosure List > 1%	

**CHEMICAL CONTROL LAW STATUS**

All components of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

**The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Quadrant Chemical Corporation assumes no responsibility for personal injury or property damage to vendees, users or third parties caused by the material. Such vendees or users assume all risks associated with the use of the material. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions, in addition to those described herein, are required. It is your responsibility to utilize the information we have supplied to develop work practice guidelines and employee instructional programs for the individual operation.**