

## Product Information

### MSDS 06

**JOWATHERM REACTANT** 10 613.70; 10 630.88; 12 633.10; 14 630.60; 16 602.80; 47 601.70; 60 600.35; 60 601.10; 60 601.70; 60 602.40; 60 603.77; 60 604.30; 60 604.40; 60 605.50; 60 606.00; 60 606.60; 60 606.80; 60 609.30; 60 633.10; 61 600.00; 61 600.40; 61 602.40; 61 602.48 600.00; 600.10; 600.19; 600.35; 600.37; 600.40; 600.45; 600.60; 600.61; 600.68; 600.90; 601.60; 601.70; 601.75; 601.88; 602.20; 602.40; 603.00; 603.07; 603.08; 603.30; 603.57; 603.67; 603.77; 604.00; 604.10; 604.17; 604.20; 604.30; 604.31; 604.38; 604.39; 604.40; 604.50; 604.59; 605.00; 605.20; 605.28; 605.40; 605.44; 605.50; 605.51; 605.59; 605.60; 605.70; 605.77; 605.79; 605.90; 606.00; 606.20; 606.21; 606.60; 606.80; 606.81; 606.85; **607.30; 607.31**; 607.39; 607.40; 607.50; 609.20; 609.30; 609.32; 609.33; 609.40; 609.47; 609.99; 612.11; 612.69; 612.80; 613.30; 613.40; 613.70; 613.75; 613.98; 634.30; 637.00; 637.10; 637.18; 639.00; EP 10 600.37; EXP 500 035 EXP 500 040; EXP 500 042; EXP 534 008; EXP 545 009; EXP 549 001

Product class: POLYURETHANE-RESINS

## Section I - General Information

Manufacturer: **Jowat Corporation**  
**5608 Uwharrie Road**  
**Archdale NC 27263**

Emergency Phone Numbers: **1 800 424 9300 ( Chemtrec 24 Hours )**  
Information Telephone Number: **336 434 9000**

Date Prepared: 05/18/99  
Prepared by: G. Haas

Date Issued: 5/10/2013

Date Reviewed: 04/10/2007

## Section II - Hazardous Ingredients

|   | CAS#     | CONCENTRATION<br>[wt. %] | OSHA PEL<br>[ppm] | ACGIH TLV<br>[ppm] |
|---|----------|--------------------------|-------------------|--------------------|
| 4,4' - Diphenyl methane diisocyanate<br>(MDI) | 101-68-8 | <4                       | 0.02              | 0.005              |

\*exposure level shall at no time exceed given value.

## Section III - Physical Data

MELTING POINT: 100°C  
% VOLATILES: N/A  
ODOR: no particular odor

BOILING POINT: N/A  
WATER SOLUBILITY: reacts with water  
FORM: solid adhesive, white-yellow color

## Section IV - Fire and Explosion Hazard Data

FLASH POINT: Above 200°C (392F) COC

FIRE AND EXPLOSION HAZARDS: During a fire, MDI and other irritating, highly toxic gases may be generated by thermal decomposition or combustion.

HAZARDOUS COMBUSTION PRODUCTS: Like most organic products it may form carbonmonoxide, -dioxide and oxide of nitrogen, and traces of HCN, MDI

EXTINGUISHING MEDIA: CO<sub>2</sub>, dry chemical, and foam water spray for large fires.

SPECIAL FIREFIGHTING PROCEDURES: fire fighters should wear self-contained breathing apparatus to avoid inhalation of smoke and vapors.

## Section V - Reactivity Data

STABILITY: Stable

CONDITIONS TO AVOID: Avoid contact with water. Moisture or high humidity will cure or gel product.

MATERIALS TO AVOID: Water, alcohols, strong bases, metal compounds, strong oxidizer.

HAZARDOUS DECOMPOSITION AND BYPRODUCTS: Like most organic products it may form carbonmonoxide, - dioxide and oxide of nitrogen, and traces of HCN, MDI.

## Section VI - Health Hazard Data

ROUTE(S) OF ENTRY:

- *Inhalation*: Although MDI is low in volatility, an inhalation hazard can exist from MDI aerosols or vapors formed during heating, foaming or spraying.
- *Ingestion*: very unlikely
- *Skin*: from liquid and aerosols (spray application)

HEALTH HAZARDS: (ACUTE AND CHRONIC)

-*Inhalation-acute*: MDI vapors or mist at concentrations above TLV 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 hyper reactivity 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 also been reported. These symptoms can be delayed up to several hours after exposure.

-*Inhalation-chronic*: 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 after exposure). 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 several years. Overexposure to isocyanates has also been reported to cause lung damage (including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent.

-*Skin-acute*: Isocyanates react with skin protein and moisture and can cause irritation which may include the following symptoms: reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove.

-*Skin-chronic*: Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases, skin sensitization. Individuals who have developed a skin sensitization can develop these symptoms as a result of contact with very small amounts of liquid material or as a result of exposure to vapor.

-*Eye contact-acute*: 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. See emergency & first aid procedures.

-*Eye contact-chronic*: None found.

-*Ingestion-acute*: 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. Ingestion is not considered a common occupational route to exposure.

-*Ingestion-chronic*: None found.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Asthma other respiratory disorders (bronchitis, emphysema, bronchial hyper reactivity), skin allergies, eczema.

CARCINOGENICITY: neither MDI nor polymeric MDI are listed by the NIP, IARC or regulated by OSHA as carcinogens.

EXPOSURE LIMITS: OSHA PEL. 0.02PPM (0.2 mg/m<sup>3</sup>) ceiling (MDI) ACGIH TLV. 0.005PPM (0.055mg/m<sup>3</sup>) TIME weight average. (MDI)

#### EMERGENCY & FIRST AID PROCEDURES

- Eye contact*: Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Refer individual to physician or ophthalmologist for immediate follow-up.
- Skin contact*: Remove contaminated clothing. Wash affected skin thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing, and then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists after the area is washed.
- *Inhalation*: move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic-type symptoms may develop immediately or delayed up to several hours. Consult physician should this occur.
- *Ingestion*: Do not induce vomiting. Give 1 to 2 cups of milk or water to drink. Do not give anything by mouth to an unconscious person. Consult physician.

#### 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 a 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

ANIMAL TOXICITY DATA: Toxicity data has not been established for this product. Data listed is for MDI.

#### ACUTE TOXICITY - MDI

ORAL, LD50: 9,400 mg/kg (rats)

DERMAL, LD50: GREATER THAN 7,900 mg/kg (rabbits)

INHALATION LC50: Approximately 370-490 mg/m<sup>3</sup> for an aerosol of polymeric MDI (rat). An LC50 (2 hr) of greater than 400 mg/m<sup>3</sup> was determined on dust of monomeric MDI (rat).

- Eye effects*: Slight irritation. A maximum primary eye irritation score for a 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 guinea pigs, rabbits and dogs. Although not well defined in experimental animal models, MDI is known to induce pulmonary and dermal sensitization in humans. In addition, there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur.

SUBCHRONIC/CHRONIC TOXICITY: Pulmonary irritation and inflammation of the upper respiratory tract are the primary ill-effects following extended 90-day inhalation study in rats of a polymeric MDI (50% monomeric MDI) delivered as an aerosol (6hr/dy, 5dy/wk) induced moderate to severe hyperplastic/inflammatory lesions of the nasal cavity and lungs at exposure of 8 mg/m<sup>3</sup> and greater. These effects were minimal at 4 mg/m<sup>3</sup>. The noel is around 2-3 mg/m<sup>3</sup>.

#### OTHER:

- Carcinogenicity*: The international isocyanate institute is sponsoring a lifetime inhalation study of polymeric MDI in rats. This study is currently underway.
- Mutagenicity*: Monomeric MDI is positive in the Ames assay (with hepatic microsomal activation). however, it was negative in an in vivo-in vitro micronucleus assay.

*-Aquatic toxicity:* LC50-24 hr (static): Greater than 500 mg/liter for daphnia magna, limnea stagnalis, and zebra fish (brachydanio rerio) for both polymeric and monomeric MDI.

## **Section VII - Precautions for Safe Handling and Use**

STORAGE TEMPERATURE: Min/max -30F (-34°C) /104F (40°C)

AVERAGE SHELF LIFE: 6 MONTHS @ 77F (25°C)

SPECIAL SENSITIVITY:

HEAT, LIGHT, MOISTURE: If container is exposed to high heat, 400F (204°C) it can be pressurized and possibly rupture. MDI reacts slowly with water to form CO<sub>2</sub> gas. This gas can cause sealed containers to expand and possibly rupture.

PRECAUTIONS TO BE TAKEN:

IN HANDLING AND STORING: Store in tightly closed container to prevent moisture contamination. Do not reseal if contamination is suspected. Avoid contact with skin and eyes. Do not breathe aerosols or vapors. 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.

STEPS TO BE TAKEN IN CASE MATERIALS IS RELEASED OR SPILLED: Sweep area and dispose of spilled material accordingly.

RDCRA status: MDI is not listed as a hazardous waste. To the best our knowledge, MDI does not meet the criteria of a hazardous waste if discarded in its purchased form. However, under RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether a product meets any of the criteria for a hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and EP toxicity (40 code of federal regulations 261.20-24).

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA), TITLE 111 SECTION 302-EXTREMELY HAZARDOUS SUBSTANCES: None

SECTION 313 - TOXIC CHEMICALS: 4,4'- diphenylmethane diisocyanate

## **Section VIII - Control Measures**

EYE PROTECTION: Liquid chemical goggles or full-face shield. Contact lenses should not be worn.

SKIN PROTECTION: Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered only by the cream to a minimum.

VENTILATION AND RESPIRATORY PROTECTION: Local exhaust ventilation should be used as required to maintain levels below the TLV whenever MDI is processed, heated or spray applied. Standard reference sources regarding industrial ventilation (i.e. ACGIH industrial ventilation) should be consulted for guidance about adequate ventilation. An air-supplied respirator must be worn during spray applications, during long-term (over 1 hour) exposures, when the product is heated, in environments of high concentrations well above the TLV of 0.005ppm, or where airborne isocyanate concentrations are unknown. For short-term (less than 1 hour) emergency situations consist of concentrations at or near the TLV, an air purifying respirator equipped with organic cartridges or canisters and dust filters can be used.

However, due to the poor warning properties of MDI, proper fit and timely replacement of filters elements must be ensured. Observe OSHA regulations for respirator use (29 CFR 1910.134).

MONITORING: MDI exposure levels must be monitored by accepted monitoring techniques to ensure that the TLV is not exceeded. See volume 1 (chapter 17) and volume 3 (chapter 3) in Patty's industrial hygiene and toxicology for sampling strategy.

MEDICAL SURVEILLANCE: Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include preemployment and periodic medical examinations with respiratory 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 MDI. Once a person is diagnosed as sensitized to MDI, no further exposure can be permitted.

## ***Section IX - Regulatory Information***

HMIS – RATING: HEALTH-1      FLAMMABILITY-1      REACTIVITY-0

DOT PROPER SHIPPING NAME: Not a regulated material

## ***Section X – Other Information***

These data are based on our present state of information. They shall, however, not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. All standard industrial precautions apply, concerning protection of health, and safe handling. The recommendations have to be examined in the context of the application for which the product is intended, and observed as necessary.