

MATERIAL SAFETY DATA SHEET



Bayer MaterialScience

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Product Safety & Regulatory Affairs
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TRANSPORTATION EMERGENCY
CALL CHEMTREC: (800) 424-9300
INTERNATIONAL: (703) 527-3887

NON-TRANSPORTATION
Bayer Emergency Phone: Call Chemtrec
Bayer Information Phone: (800) 662-2927

1. Product and Company Identification

Product Name: MONDUR MR®
Material Number: 3047753
Chemical Family: Aromatic Isocyanate
Chemical Name: Polymeric Diphenylmethane Diisocyanate (pMDI)
CAS-No.: 9016-87-9

2. Hazards Identification

Emergency Overview

WARNING! Color: Dark brown, Black **Form:** liquid **Odor:** musty.
Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation

Acute Inhalation

For Product: MONDUR MR®

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.

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<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
45 - 55%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9
35 - 45%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 10%	Diphenylmethane Diisocyanate (MDI) Mixed Isomers	26447-40-5

4. First Aid Measures

Eye Contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention.

Skin Contact

Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops.

Inhalation

Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion

Do not induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician

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.

5. Fire-Fighting Measures

Suitable Extinguishing Media: dry chemical, carbon dioxide (CO₂), foam, water spray for large fires.

Special Fire Fighting Procedures

Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. 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.

Unusual Fire/Explosion Hazards

Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO₂ formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between

Further Info on Storage Conditions

Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure Controls / Personal Protection

4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 0.005 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Ceiling Limit Value: 0.02 ppm, 0.2 mg/m³

Industrial Hygiene/Ventilation Measures

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, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available, upon request.

Respiratory Protection

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 respirator 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).

Hand Protection

Gloves should be worn., Nitrile rubber showed excellent resistance., Butyl rubber, neoprene and PVC are also effective.

Eye Protection

When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

Skin and body protection

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., 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.

Medical Surveillance

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of 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

Repeated Dose Toxicity

90 Days, inhalation: NOAEL: 1 mg/m³, (rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity.

2 years, inhalation: NOAEL: 0.2 mg/m³, (rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity.

Mutagenicity

Genetic Toxicity in Vitro:

Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity

rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week

Exposure to a level of 6 mg/m³ polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

Developmental Toxicity/Teratogenicity

rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m³, NOAEL (maternal): 4 mg/m³

No Teratogenic effects observed at doses tested. Fetotoxicity seen only with maternal toxicity.

Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI)**Acute Inhalation Toxicity**

LC50: 369 mg/m³, 4 hrs (rat, Male/Female)

LC50: > 2240 mg/m³, aerosol, 1 h (rat)

Acute dermal toxicity

LD50: > 10,000 mg/kg (rabbit)

Skin Irritation

rabbit, Draize Test, Slightly irritating

Eye Irritation

rabbit, Draize Test, Slightly irritating

Sensitization

dermal: sensitizer (guinea pig, Maximisation Test (GPMT))

inhalation: sensitizer (Guinea pig)

Repeated Dose Toxicity

90 Days, inhalation: NOAEL: 0.3 mg/m³, (rat, Male/Female, 18 hrs/day, 5 days/week)

Irritation to lungs and nasal cavity.

Mutagenicity

Genetic Toxicity in Vitro:

Ames: (Salmonella typhimurium, Metabolic Activation: with/without)

Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.

Genetic Toxicity in Vivo:

Micronucleus Assay: negative (mouse)

Carcinogenicity

rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week

negative

UN/NA Number: NA3082
Packaging Group: III
Hazard Label(s): Class 9

RSPA/DOT Regulated Components:

4,4'-Diphenylmethane Diisocyanate (MDI)

Reportable Quantity: 11,111 lb

Sea transport (IMDG)

Non-Regulated

Air transport (ICAO/IATA)

Non-Regulated

Additional Transportation Information

When in individual containers of less than the Product RQ, this material ships as non-regulated.

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components

4,4'-Diphenylmethane Diisocyanate Reportable quantity: 5,000 lbs
(MDI)

SARA Section 311/312 Hazard Categories:

Acute Health Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III
Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components

None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III
Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components

Polymeric Diphenylmethane Diisocyanate (pMDI)
4,4'-Diphenylmethane Diisocyanate (MDI)

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes
and Appendix VIII Hazardous Constituents (40 CFR 261):

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. (40 CFR 261.20-24)

State Right-To-Know Information

Material Name: MONDUR MR®

Article Number: 3047753

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