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## **SECTION 1: Identification of the substance/mixture and of the company/undertaking**

### **Product identifiers**

Product name : 4,4'-MDI

Product Number : 33428

Index-No. : 615-005-00-9

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

CAS-No. : 101-68-8

### **Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Manufacture of substances

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## **SECTION 2: Hazards identification**

### **Classification of the substance or mixture**

#### **Classification according to Regulation (EC) No 1272/2008**

Acute toxicity, Inhalation (Category 4), H332

Skin irritation (Category 2), H315

Eye irritation (Category 2), H319

Respiratory sensitization (Category 1), H334

Skin sensitization (Category 1), H317

Carcinogenicity (Category 2), H351

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Respiratory system, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

**Label elements**
**Labelling according Regulation (EC) No 1272/2008**

Pictogram



Signal word

Danger

Hazard statement(s)

H315

Causes skin irritation.

H317

May cause an allergic skin reaction.

H319

Causes serious eye irritation.

H332

Harmful if inhaled.

H334

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H335

May cause respiratory irritation.

H351

Suspected of causing cancer.

H373

May cause damage to organs (Respiratory system) through prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P201

Obtain special instructions before use.

P280

Wear protective gloves.

P302 + P352

IF ON SKIN: Wash with plenty of water.

P305 + P351 + P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard Statements

none

**Other hazards**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Lachrymator.

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**SECTION 3: Composition/information on ingredients**
**3.1 Substances**

 Synonyms : 4,4'-Methylenebis(phenyl isocyanate)  
 4,4'-MDI  
 Bis(4-isocyanatophenyl)methane

 Formula : C<sub>15</sub>H<sub>10</sub>N<sub>2</sub>O<sub>2</sub>

Molecular weight : 250,25 g/mol

CAS-No. : 101-68-8

EC-No. : 202-966-0

Index-No. : 615-005-00-9

Component	Classification	Concentration
<b>diphenylmethane-4,4'-diisocyanate</b>		



	Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2; Resp. Sens. 1; Skin Sens. 1; Carc. 2;	<= 100 %
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	<p>STOT SE 3; STOT RE 2; H332, H315, H319, H334, H317, H351, H335, H373 Concentration limits: &gt;= 5 %: Eye Irrit. 2, H319; &gt;= 5 %: STOT SE 3, H335; &gt;= 5 %: Skin Irrit. 2, H315; &gt;= 0,1 %: Resp. Sens. 1, H334;</p>
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For the full text of the H-Statements mentioned in this Section, see Section 16.

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## SECTION 4: First aid measures

### Description of first-aid measures

#### General advice

Consult a physician. Show this material safety data sheet to the doctor in attendance.

#### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

#### In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

#### In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

#### If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### Indication of any immediate medical attention and special treatment needed

No data available

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## SECTION 5: Firefighting measures

### Extinguishing media

#### Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### Special hazards arising from the substance or mixture

Carbon oxides, Nitrogen oxides (NO<sub>x</sub>)

### Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

### Further information

No data available

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## **SECTION 6: Accidental release measures**

### **Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

### **Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### **Methods and materials for containment and cleaning up**

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

### **Reference to other sections**

For disposal see section 13.

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## **SECTION 7: Handling and storage**

### **Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

### **Conditions for safe storage, including any incompatibilities**

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature -20 °C

Moisture sensitive. Store under argon.

### **Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## **SECTION 8: Exposure controls/personal protection**

### **Control parameters**

#### **Ingredients with workplace control parameters**

### **Exposure controls**

#### **Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

#### **Personal protective equipment**

##### **Eye/face protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

##### **Skin protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Full contact

Material: Nature latex/chloroprene

Minimum layer thickness: 0,6 mm

Break through time: 480 min

Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0,11 mm

Break through time: 60 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

### **Body Protection**

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

### **Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### **Control of environmental exposure**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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## **SECTION 9: Physical and chemical properties**

### **Information on basic physical and chemical properties**

- |                                            |                                        |
|--------------------------------------------|----------------------------------------|
| a) Appearance                              | Form: crystalline<br>Color: white      |
| b) Odor                                    | No data available                      |
| c) Odor Threshold                          | No data available                      |
| d) pH                                      | No data available                      |
| e) Melting point/freezing point            | Melting point/range: 42 - 45 °C - lit. |
| f) Initial boiling point and boiling range | 200 °C at 7 hPa - lit.                 |

g) Flash point 113 °C - closed cup

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|-------------------------------------------------|-------------------------------------------------------|
| h) Evaporation rate                             | No data available                                     |
| i) Flammability (solid, gas)                    | The product is not flammable. - Flammability (solids) |
| j) Upper/lower flammability or explosive limits | No data available                                     |
| k) Vapor pressure                               | No data available                                     |
| l) Vapor density                                | No data available                                     |
| m) Relative density                             | 1,18 g/cm <sup>3</sup> at 25 °C                       |
| n) Water solubility                             | No data available                                     |
| o) Partition coefficient: n-octanol/water       | No data available                                     |
| p) Autoignition temperature                     | > 601 °C<br>at 1.013 hPa                              |
| q) Decomposition temperature                    | No data available                                     |
| r) Viscosity                                    | No data available                                     |
| s) Explosive properties                         | No data available                                     |
| t) Oxidizing properties                         | No data available                                     |

**Other safety information**

No data available

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**SECTION 10: Stability and reactivity**

**Reactivity**

No data available

**Chemical stability**

Stable under recommended storage conditions.

**Possibility of hazardous reactions**

No data available

**Conditions to avoid**

No data available

**Incompatible materials**

Water, Amines, Strong bases, Alcohols

**Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NO<sub>x</sub>)

Other decomposition products - No data available

In the event of fire: see section 5



## **SECTION 11: Toxicological information**

### **11.1 Information on toxicological effects**

#### **Acute toxicity**

LD50 Oral - Rat - 9.200 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Ataxia.  
Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

LC50 Inhalation - Rat - male and female - 1 h - > 2,24 mg/l  
(OECD Test Guideline 403)

#### **Skin corrosion/irritation**

No data available

#### **Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Moderate eye irritation

#### **Respiratory or skin sensitization**

in vivo assay - Guinea pig

Result: May cause sensitization by inhalation.

in vivo assay - Mouse

Result: May cause sensitization by skin contact.

#### **Germ cell mutagenicity**

Laboratory experiments have shown mutagenic effects.

Ames test

S. typhimurium

Result: negative

Mutagenicity (micronucleus test)

Rat - male

Result: negative

#### **Carcinogenicity**

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

#### **Reproductive toxicity**

##### **Specific target organ toxicity - single exposure**

Inhalation - May cause respiratory irritation. - Respiratory system

##### **Specific target organ toxicity - repeated exposure**

Inhalation - May cause damage to organs through prolonged or repeated exposure. - Respiratory system

#### **Aspiration hazard**

No data available

#### **Additional Information**

RTECS: NQ9350000

Cough, Shortness of breath, Headache, Nausea, Vomiting, Pulmonary edema. Effects may be delayed.

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## SECTION 12: Ecological information

### Toxicity

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 0,35 mg/l - 24 h

### Persistence and degradability

#### Bioaccumulative potential

Bioaccumulation Cyprinus carpio (Carp) - 28 d  
- 0,0008 mg/l(diphenylmethane-4,4'-diisocyanate)

Bioconcentration factor (BCF): 92

#### Mobility in soil

No data available

#### Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**Other adverse effects** Do not empty into drains. No data available

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

#### Contaminated packaging

Dispose of as unused product.

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## SECTION 14: Transport information

#### UN number

ADR/RID: - IMDG: - IATA: 3335

#### UN proper shipping name

ADR/RID: Not dangerous goods  
IMDG: Not dangerous goods  
IATA: Aviation regulated solid, n.o.s. (diphenylmethane-4,4'-diisocyanate)

#### Transport hazard class(es)

ADR/RID: - IMDG: - IATA: 9

#### Packaging group

ADR/RID: - IMDG: - IATA: III

#### Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

**Special precautions for user**

No data available

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**SECTION 15: Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

**Authorisations and/or restrictions on use**

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)

: diphenylmethane-4,4'-diisocyanate

**Chemical Safety Assessment**

For this product a chemical safety assessment was not carried out

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END OF MSDS