

# SAFETY DATA SHEET

## CARADATE 80 (TDI)

Version 3.0

Revision Date 05.05.2022

Print Date 03.09.2022

### 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name : CARADATE 80 (TDI)

Product code : U3713

CAS-No. : 26471-62-5

Synonyms : Methyl phenylene diisocyanate, TDI 80:20, Toluene 2,4- and 2,6-diisocyanate mixture

#### Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Chemicals Europe B.V.**  
PO Box 2334  
3000 CH Rotterdam  
Netherlands

Telephone : +31 (0)10 441 5137 +31(0)10 441 5191

Telefax : +31 (0)20 716 8316/ +31 (0)20 713 9230

Emergency telephone number : +44 (0) 1235 239 670 (This telephone number is available 24 hours per day, 7 days per week)

#### Recommended use of the chemical and restrictions on use

Recommended use : Use for the manufacture of polyurethane products.

Restrictions on use : This product must not be used in applications other than the above without first seeking the advice of the supplier.,  
Restricted to professional users.

Other information : CARADATE is a trademark owned by Shell Trademark Management B.V. and Shell Brands Inc. and used by affiliates of Royal Dutch Shell plc.

### 2. HAZARDS IDENTIFICATION

#### Classification (REGULATION (EC) No 1272/2008)

Skin irritation : Category 2

Skin sensitisation : Category 1

Eye irritation : Category 2

Acute toxicity (Inhalation) : Category 1

Respiratory sensitisation : Category 1

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

Carcinogenicity : Category 2

Long-term (chronic) aquatic hazard : Category 3

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### Label elements

Hazard pictograms

:



Signal word

: Danger

Hazard statements

: **PHYSICAL HAZARDS:**  
Not classified as a physical hazard according to CLP criteria.  
**HEALTH HAZARDS:**  
H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H330 Fatal if inhaled.  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H335 May cause respiratory irritation.  
H351 Suspected of causing cancer.  
**ENVIRONMENTAL HAZARDS:**  
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**  
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P273 Avoid release to the environment.  
**Response:**  
P302 + P352 IF ON SKIN: Wash with plenty of water and soap.  
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.  
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.  
**Storage:**  
No precautionary phrases.  
**Disposal:**  
P501 Dispose of contents/ container to an approved waste disposal plant.

### Other hazards

This material reacts with water to produce a violent chemical reaction. This material is a static accumulator. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture

: Substance

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### Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration (% w/w)
m-tolylidene diisocyanate	26471-62-5	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 1; H330 Resp. Sens. 1; H334 STOT SE 3; H335 Carc. 2; H351 Aquatic Chronic 3; H412	<= 100

Refer to Chapter 8 for Occupational Exposure Guidelines.

For explanation of abbreviations see section 16.

### Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
4-methyl-m-phenylene diisocyanate	584-84-9	>= 80
2-methyl-m-phenylene diisocyanate	91-08-7	<=20

### Other information

Refer to Chapter 8 for Occupational Exposure Guidelines.

## 4. FIRST-AID MEASURES

- General advice : DO NOT DELAY.  
Keep victim calm. Obtain medical treatment immediately.
- If inhaled : Call emergency number for your location / facility.  
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.
- In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
- In case of eye contact : Immediately flush eye(s) with plenty of water.

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	<p>Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>Transport to the nearest medical facility for additional treatment.</p>
If swallowed	<p>: If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth.</p>
Most important symptoms and effects, both acute and delayed	<p>: Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.</p> <p>Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death.</p> <p>Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.</p> <p>Skin sensitisation (allergic skin reaction) signs and symptoms may include itching and/or a rash.</p> <p>Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.</p> <p>Respiratory sensitisation signs and symptoms are asthma-like and may include difficulty breathing, sneezing, wheezing and/or collapse due to inability to breath.</p> <p>No specific hazards under normal use conditions.</p> <p>Ingestion may result in nausea, vomiting and/or diarrhoea.</p>
Protection of first-aiders	<p>: When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.</p>
Notes to physician	<p>: IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!</p> <p>Artificial respiration and/or oxygen may be necessary. Treat symptomatically. Following cases of gross over-exposure, investigation of liver, kidney and eye function may be advisable. Records of such incidents should be maintained for future reference.</p> <p>Product is a respiratory irritant and potential respiratory sensitiser. Treatment is essentially symptomatic for primary irritation or bronchospasm.</p> <p>Exposed persons may be kept under medical observation for at least 48 hours because delayed effects may occur.</p> <p>If skin sensitisation has developed and a causal relationship has been confirmed, further exposure should not be allowed. Call a doctor or poison control center for guidance.</p>

### 5. FIRE-FIGHTING MEASURES

#### Flammable properties

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Flash point	: 132 °C / 270 °F
Ignition temperature	: > 595 °C / > 1103 °F
Upper explosion limit	: 9,5 %(V) ( 150 °C)
Lower explosion limit	: 0,9 %(V) ( 118 °C)
Flammability (solid, gas)	: Not applicable
Suitable extinguishing media	: Large fires should only be fought by properly trained fire fighters. Dry chemical powder, carbon dioxide or protein based foam. If water has to be used it must only be sprayed in large quantities. Do not discharge extinguishing waters into the aquatic environment. Foam. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Dry sand
Unsuitable extinguishing media	: Do not use water in a jet.
Specific hazards during firefighting	: Will only burn if enveloped in a pre-existing fire. Reacts violently with water. Water reacts vigorously with hot product forming insoluble solids which block drains. Hazardous combustion products may include: Amines. Carbon dioxide Hydrogen cyanide Organic nitrogen compounds. Unidentified organic and inorganic compounds. Toxic gases TDI Carbon monoxide.
Specific extinguishing methods	: Standard procedure for chemical fires.
Further information	: Clear fire area of all non-emergency personnel. All storage areas should be provided with adequate fire fighting facilities. Keep adjacent containers cool by spraying with water.
Special protective equipment for firefighters	: Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

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### 6. ACCIDENTAL RELEASE MEASURES

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|---|--|
| Personal precautions, protective equipment and emergency procedures | : Observe all relevant local and international regulations.<br>Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.<br>Local authorities should be advised if significant spillages cannot be contained.<br><br>: Avoid inhaling vapour and/or mists.<br>Stay upwind and keep out of low areas.<br>Avoid contact with the skin.<br>Isolate hazard area and deny entry to unnecessary or unprotected personnel.<br>Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.   |
| Environmental precautions   | : Use appropriate containment to avoid environmental contamination.<br>Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.<br>Ventilate contaminated area thoroughly.   |
| Methods and materials for containment and cleaning up               | : Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays.<br>Large spillage:<br>Prevent from spreading by making a barrier with sand, earth or other containment material.<br>Transfer to a labelled, sealable container for product recovery or safe disposal.<br>Do not flush away residues with water. Retain as contaminated waste.<br>Decontaminate residues as for small spillage.<br>Small spillage:<br>Contain and cover the spillage with decontaminant, wet earth or wet sand and leave to react for at least 30 minutes.<br>Shovel residues into open-top drums and remove for further decontamination, where necessary. Wash area well with water and inspect.<br>Retain washings as contaminated waste.<br>Put leaking containers in a labelled drum or overdrum. |
| Additional advice   | : For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.<br>For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.<br>DO NOT dispose of unreacted product.<br>Proper disposal should be evaluated based on regulatory status of this material (refer to Section 13), potential contamination from subsequent use and spillage, and regulations governing disposal in the local area.<br>Highly Toxic.<br>Keep animals off contaminated vegetation.<br>May burn although not readily ignitable.<br>Reaction with water produces insoluble solids which block   |

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drains.

Suitable decontaminant solutions:

Sodium carbonate 5-10%, Liquid Detergent 0.2-2%, Water to make up 100%.

Concentrated ammonia solution (0.880) 3 - 8 %; Liquid detergent 0.2 - 2 %.; Water 90 - 95%

The decontaminant made of concentrated ammonia is regarded as an alternative only to be used if appropriate personal and environmental measures are taken i.e. full mask respirators and gloves should be worn and the solution should be prevented from entering the drains.

### 7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.  
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.  
Ensure that all local regulations regarding handling and storage facilities are followed.

Advice on safe handling : Avoid exposure. Obtain special instructions before use.  
Avoid inhaling vapour and/or mists.  
Monitor concentrations in air at regular intervals.  
Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded.  
Use local exhaust extraction over processing area.  
Avoid unintentional contact with isocyanates to prevent uncontrolled polymerisation.  
For lines and fittings, avoid copper, copper alloys, zinc.  
Avoid contact with skin, eyes and clothing.  
It is recommended that the product be handled in a closed system. If this is not practicable use local exhaust extraction or wear respiratory protection.  
To avoid uncontrolled polymerisation, avoid unintentional mixing with water, alcohols and polyols.  
Do not empty into drains.  
Handling Temperature:  
Ambient.  
Agitate product whilst heating.  
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.  
Decontaminant should be readily available.  
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.  
Bulk storage tanks should be diked (bunded).  
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.  
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.

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If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

Even when the product is not itself flammable, such vapours may be present as a result of operations involving a previously handled product, or faulty vapour recovery systems.

Restrict line velocity during pumping in order to avoid generation of electrostatic discharge ( $\leq 1$  m/s until fill pipe submerged to twice its diameter, then  $\leq 7$  m/s). Avoid splash filling.

Do NOT use compressed air for filling, discharging, or handling operations.

Avoidance of contact : Avoid contact with strong oxidizing agents, copper and copper alloys.

Product Transfer : If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve. Lines should be purged with nitrogen before and after product transfer. Refer to supplier for further product transfer instructions if required. Refer to guidance under Handling section.

### Storage

Storage temperature : 18 - 25 °C

18 - 25 °C

Storage period : 6 month(s)

Other data : Prevent all contact with water and moist atmosphere because CO<sub>2</sub> may be liberated leading to excessive pressure in closed containers and formation of solid insoluble polymers, which can block pipes, valves, etc.  
Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.  
A reliable fixed sprinkler/deluge system should be installed.  
Prevent all contact with water and with moist atmosphere.  
Pressurization of drums to empty may result in a potentially hazardous container failure.  
Keep container tightly closed.  
Tanks must be clean, dry and rust-free.  
Prevent ingress of water.  
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat.  
Tanks should be fitted with a vapour recovery system.  
Vapours from tanks should not be released to atmosphere.  
Breathing losses during storage should be controlled by a suitable vapour treatment system.  
Fit silica gel driers in small tanks if not nitrogen blanketed.  
Drums should be stacked to a maximum of 3 high.  
Storage Period:  
6 months  
Storage Temperature:  
18°C / 64 °F minimum



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25 °C / 77 °F maximum.

Tanks should be fitted with heating coils in areas where ambient conditions can result in handling temperatures below the freezing point/pour point of the product.

Potential exists for runaway reaction at elevated temperatures in the presence of strong bases and salts of strong bases.

Temperatures above 43 °C: product dimerization might occur above this temperature.

Electrostatic charges will be generated during pumping.

Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.

Packaging material : Suitable material: For lines and fittings, use mild steel, stainless steel.  
Unsuitable material: Copper., Copper alloys., Zinc.

Specific use(s) : Not applicable

Ensure that all local regulations regarding handling and storage facilities are followed.

Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Polymerisation may cause violent rupture of cargo tanks or piping.

See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).

IEC/TS 60079-32-1: Electrostatic hazards, guidance

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Data Source
4-methyl-m-phenylene diisocyanate	584-84-9	MPC-STEL (vapour and/or gas)	0,05 mg/m3	RU OEL
Further information: Class 1 - Extremely dangerous, Allergens				
2-methyl-m-phenylene diisocyanate	91-08-7	MPC-STEL (vapour and/or gas)	0,05 mg/m3	RU OEL
Further information: Class 1 - Extremely dangerous, substance causing allergic reactions in the working environment, Substances that need automatic monitoring of their content in the air				

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**Biological occupational exposure limits**

No biological limit allocated.

**Monitoring Methods**

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods  
<http://www.cdc.gov/niosh/>

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods  
<http://www.osha.gov/>

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances  
<http://www.hse.gov.uk/>

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany  
<http://www.dguv.de/inhalt/index.jsp>

L'Institut National de Recherche et de Sécurité, (INRS), France <http://www.inrs.fr/accueil>

**Engineering measures**

- : Use sealed systems as far as possible.
- Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.
- Local exhaust ventilation is recommended.
- Eye washes and showers for emergency use.
- Items that cannot be decontaminated should be destroyed (see Chapter 13).
- Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
- The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances.
- Appropriate measures include:

**General Information:**

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when there is potential for inhalation; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

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### Personal protective equipment

#### Protective measures

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.

Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].

Hand protection  
Remarks

: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. When prolonged or frequent repeated contact occurs. PVC. Nitrile rubber. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye protection : Wear goggles for use against liquids and gas.  
Wear full face shield if splashes are likely to occur.

Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.

Thermal hazards : Not applicable

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Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.  
Laundry contaminated clothing before re-use.

### Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.  
Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Section 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Colour : Pale yellow

Odour : Sharp, pungent

Odour Threshold : 0,2 ppm

pH : Not applicable

Melting / freezing point : 10 °C / 50 °F

Boiling point/boiling range : 252 - 254 °C / 486 - 489 °F (1013,0 hPa)

Flash point : 132 °C / 270 °F

Evaporation rate : Data not available

Flammability (solid, gas) : Not applicable

Upper explosion limit : 9,5 %(V)  
( 150 °C / 302 °F)

Lower explosion limit : 0,9 %(V)  
( 118 °C / 244 °F)

Vapour pressure : 0,015 hPa (20 °C / 68 °F)

Relative vapour density : 6 (25 °C / 77 °F)

Relative density : Data not available

Density : 1.220 kg/m<sup>3</sup> (20 °C / 68 °F)

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Method: ASTM D4052

### Solubility(ies)

Water solubility : insoluble, Reacts with water to form carbon dioxide and insoluble polyureas.

Solubility in other solvents : Data not available

Partition coefficient: n-octanol/water : log Pow: 3,4

Auto-ignition temperature : > 595 °C / > 1103 °F

Decomposition temperature : Data not available

### Viscosity

Viscosity, dynamic : 2.200 mPa.s (estimated value(s) 20 °C / 68 °F)  
Method: ASTM D445

Viscosity, kinematic : Data not available

Explosive properties : Not applicable

Oxidizing properties : Data not available

Surface tension : Data not available

Conductivity : Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

Particle size : Data not available

Molecular weight : Data not available

## 10. STABILITY AND REACTIVITY

Reactivity : The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

Chemical stability : Stable under ambient conditions. Reacts exothermically with bases (eg caustic soda), ammonia, primary and secondary amines, alcohols, water and acids. Hygroscopic. Reacts with water to form carbon dioxide and insoluble polyureas. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of reaction

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partners is good or is supported by stirring or by the presence of solvents. Material will start to polymerize at elevated temperatures above 43 °C or if contaminated with water.

Possibility of hazardous reactions	: Hygroscopic.
Conditions to avoid	: Heat, flames, and sparks. Exposure to water vapour. Extended periods above 35 deg. C In certain circumstances product can ignite due to static electricity.
Incompatible materials	: Avoid contact with strong oxidizing agents, copper and copper alloys.
Hazardous decomposition products	: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

### 11. TOXICOLOGICAL INFORMATION

Basis for assessment	: Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s). Information given is based on product testing.
Information on likely routes of exposure	: Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

#### Acute toxicity

##### Components:

##### **m-tolylidene diisocyanate:**

Acute oral toxicity	: LD50 : > 5.000 mg/kg Remarks: Low toxicity:
Acute inhalation toxicity	: LC50 : <= 0,5 mg/l Remarks: Fatal if inhaled.
Acute dermal toxicity	: LD50 : > 5.000 mg/kg Remarks: Low toxicity:

#### Skin corrosion/irritation

##### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Causes skin irritation.

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### Serious eye damage/eye irritation

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Causes eye irritation.

### Respiratory or skin sensitisation

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: May cause sensitisation by inhalation.

May cause sensitization by skin contact.

### Germ cell mutagenicity

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Non mutagenic, Based on available data, the classification criteria are not met.

### Carcinogenicity

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Suspected of causing cancer.

Material	GHS/CLP Carcinogenicity Classification
m-tolylidene diisocyanate	Carcinogenicity Category 2
4-methyl-m-phenylene diisocyanate	Carcinogenicity Category 2
2-methyl-m-phenylene diisocyanate	Carcinogenicity Category 2

Material	Other Carcinogenicity Classification
m-tolylidene diisocyanate	IARC: Group 2B: Possibly carcinogenic to humans
4-methyl-m-phenylene diisocyanate	IARC: Group 2B: Possibly carcinogenic to humans
2-methyl-m-phenylene diisocyanate	IARC: Group 2B: Possibly carcinogenic to humans

### Reproductive toxicity

#### **Components:**

##### **m-tolylidene diisocyanate:**

Remarks: Not a developmental toxicant., Based on available data, the classification criteria are not met., Does not impair fertility.

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### STOT - single exposure

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: May cause respiratory irritation.

### STOT - repeated exposure

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Based on available data, the classification criteria are not met.

### Aspiration toxicity

#### Components:

##### **m-tolylidene diisocyanate:**

Not an aspiration hazard.

### Further information

#### Components:

##### **m-tolylidene diisocyanate:**

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

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## 12. ECOLOGICAL INFORMATION

Basis for assessment : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).  
Information given is based on product testing.

### Ecotoxicity

#### Components:

##### **m-tolylidene diisocyanate :**

Toxicity to fish (Acute toxicity) : LC50 : > 100 mg/l  
Remarks: Practically non toxic:

Toxicity to crustacean (Acute toxicity) : EC50 : > 10 - 100 mg/l  
Remarks: Harmful

Toxicity to algae/aquatic plants (Acute toxicity) : EC50 : > 100 mg/l  
Remarks: Practically non toxic:

Toxicity to microorganisms (Acute toxicity) : IC50 : > 100 mg/l  
Remarks: Practically non toxic:

Toxicity to fish (Chronic toxicity) : Remarks: Data not available



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Toxicity to crustacean(Chronic toxicity) : Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)

### Persistence and degradability

#### Components:

**m-tolylidene diisocyanate :**

Biodegradability : Remarks: Not readily biodegradable.

### Bioaccumulative potential

#### Product:

Partition coefficient: n-octanol/water : log Pow: 3,4

#### Components:

**m-tolylidene diisocyanate :**

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

### Mobility in soil

#### Components:

**m-tolylidene diisocyanate :**

Mobility : Remarks: If it enters soil, it will adsorb to soil particles and will not be mobile.

### Other adverse effects

no data available

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## 13. DISPOSAL CONSIDERATIONS

### Disposal methods

Waste from residues : Recover or recycle if possible.  
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses  
Waste product should not be allowed to contaminate soil or water.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.  
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Drain container thoroughly.  
After draining, vent in a safe place away from sparks and fire.  
Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums.  
Send to drum recoverer or metal reclaimer.

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### 14. TRANSPORT INFORMATION

#### International Regulations

##### ADR

UN number : 2078  
Proper shipping name : TOLUENE DIISOCYANATE  
Class : 6.1  
Packing group : II  
Labels : 6.1  
Hazard Identification Number : 60  
Environmentally hazardous : no

##### IATA-DGR

UN/ID No. : UN 2078  
Proper shipping name : Toluene diisocyanate  
Class : 6.1  
Packing group : II  
Labels : 6.1

##### IMDG-Code

UN number : UN 2078  
Proper shipping name : TOLUENE DIISOCYANATE  
Class : 6.1  
Packing group : II  
Labels : 6.1  
Marine pollutant : no

#### Maritime transport in bulk according to IMO instruments

Pollution category : Y  
Ship type : 2  
Product name : Toluene diisocyanate

#### Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

**Additional Information** : This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

### 15. REGULATORY INFORMATION

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

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

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### Other international regulations

The components of this product are reported in the following inventories:

AIIC	: Listed
DSL	: Listed
IECSC	: Listed
ENCS	: Listed
KECI	: Listed
NZIoC	: Listed
PICCS	: Listed
TSCA	: Listed
TCSI	: Listed

## 16. OTHER INFORMATION

### Full text of H-Statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H412	Harmful to aquatic life with long lasting effects.

### Full text of other abbreviations

Acute Tox.	Acute toxicity
Aquatic Chronic	Long-term (chronic) aquatic hazard
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Resp. Sens.	Respiratory sensitisation
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation
STOT SE	Specific target organ toxicity - single exposure

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

SDS Regulation :  
1. GN 2.2.5.1313-03 "Maximum permissible concentration of harmful substance in the working zone area".  
2. GOST 12.1.007-76 "Harmful agents. Classification and safety requirements."  
3. GOST 12.1.005-88 "General hygiene requirements to the working zone area".  
4. GN 2.1.5.1315-03 "Reservoir water maximum permissible concentration".  
5. GOST 19433-88 "Dangerous goods. Classification and

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marking".

6. Rail transportation safety rules and dangerous goods accidents liquidation procedure.

7. GOST 30333-2007 Chemical product safety data sheet. General requirements.

Regulation 1907/2006/EC

### Further information

Training advice : Provide adequate information, instruction and training for operators.

Other information : A vertical bar (|) in the left margin indicates an amendment from the previous version.

Sources of key data used to compile the Safety Data Sheet : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID data base, EC 1272 regulation, etc).

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.