

SAFETY DATA SHEET

This Safety data sheet is subject to the Egyptian standard ES 8398 "Safety data sheet for chemical products" According to ISO 11014 /2009

CARADATE 80 (TDI)

Print Date 29.08.2022

Revision Date 20.10.2021

Version 1.3

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

1.1 Product identifier

Trade 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

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture	: Use for the manufacture of polyurethane products.
Uses advised against	: This product must not be used in applications other than the above without first seeking the advice of the supplier., Restricted to professional users.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier	: SHELL MARKETS (MIDDLE EAST) LIMITED CHEMICALS PO Box 307 JEBEL ALI, DUBAI Unit.Arab Emir.
Telephone	: +971 4 405 4400
Telefax	: +971 4 329 3311
Email Contact for Safety Data Sheet	:

1.4 Emergency telephone number

+ (65) 6542 9595 (Alert-SGS)

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.
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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GHS Classification

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
Short-term (acute) aquatic hazard	: Category 3
Long-term (chronic) aquatic hazard	: Category 3

2.2 Label elements

GHS-Labeling

Hazard pictograms



Signal word

: Danger

Hazard statements

: PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS 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:
H402 Harmful to aquatic life.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

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P284 In case of inadequate ventilation wear respiratory protection.

P273 Avoid release to the environment.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water and soap.

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P310 Immediately call a POISON CENTER/ doctor.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Disposal:

P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

2.3 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.

SECTION 3: Composition/information on ingredients

3.1 Substances

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
m-tolylidene diisocyanate	26471-62-5	<= 100

Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
4-methyl-m-phenylene	584-84-9	>= 80

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diisocyanate		
2-methyl-m-phenylene diisocyanate	91-08-7	-<= 20

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : DO NOT DELAY.
Keep victim calm. Obtain medical treatment immediately.
- Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
- 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.
Remove contact lenses, if present and easy to do. Continue rinsing.
Transport to the nearest medical facility for additional treatment.
- If swallowed : 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.

4.2 Most important symptoms and effects, both acute and delayed

- Symptoms : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
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.

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Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Skin sensitisation (allergic skin reaction) signs and symptoms may include itching and/or a rash.
Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.
Respiratory sensitisation signs and symptoms are asthma-like and may include difficulty breathing, sneezing, wheezing and/or collapse due to inability to breath.

No specific hazards under normal use conditions.
Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
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.
Product is a respiratory irritant and potential respiratory sensitizer. Treatment is essentially symptomatic for primary irritation or bronchospasm.
Exposed persons may be kept under medical observation for at least 48 hours because delayed effects may occur.
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.

SECTION 5: Firefighting measures

5.1 Extinguishing media

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.

5.2 Special hazards arising from the substance or mixture

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

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organic and inorganic compounds. Toxic gases TDI Carbon monoxide.

5.3 Advice for firefighters

- 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).
- 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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions : Observe all relevant local and international regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Avoid inhaling vapour and/or mists. Stay upwind and keep out of low areas. Avoid contact with the skin. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.

6.2 Environmental precautions

- Environmental precautions : Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Ventilate contaminated area thoroughly.

6.3 Methods and materials for containment and cleaning up

- Methods for cleaning up : Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays.

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Large spillage:

Prevent from spreading by making a barrier with sand, earth or other containment material.

Transfer to a labelled, sealable container for product recovery or safe disposal.

Do not flush away residues with water. Retain as contaminated waste.

Decontaminate residues as for small spillage.

Small spillage:

Contain and cover the spillage with decontaminant, wet earth or wet sand and leave to react for at least 30 minutes.

Shovel residues into open-top drums and remove for further decontamination, where necessary. Wash area well with water and inspect.

Retain washings as contaminated waste.

Put leaking containers in a labelled drum or overdrum.

6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.,For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.,DO NOT dispose of unreacted product.,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.,Highly Toxic.,Keep animals off contaminated vegetation.,May burn although not readily ignitable.,Reaction with water produces insoluble solids which block 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.

SECTION 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.

7.1 Precautions for safe handling

Advice on safe handling

- : Avoid exposure. Obtain special instructions before use.
- Avoid inhaling vapour and/or mists.
- Monitor concentrations in air at regular intervals.

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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.
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 (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling.
Do NOT use compressed air for filling, discharging, or handling operations.

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.

7.2 Conditions for safe storage, including any incompatibilities

Storage period : 6 month(s)

Storage temperature : 18 - 25 °C

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64 - 77 °F

Other data

: Prevent all contact with water and moist atmosphere because CO₂ 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 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.

7.3 Specific end use(s)

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.

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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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

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>

8.2 Exposure controls

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:

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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.

Personal protective equipment

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

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

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.

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

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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)].

Thermal hazards : Not applicable

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet. Launder 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : Liquid.

Colour : Pale yellow

Odour : Sharp, pungent

Odour Threshold : 0,2 ppm

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pH	: Not applicable
Melting / freezing point	: 10 °C
Boiling point/boiling range	: 252 - 254 °C (1013,0 hPa)
Flash point	: 132 °C
Evaporation rate	: Data not available
Flammability (solid, gas)	: Not applicable
Upper explosion limit	: 9,5 %(V) (150 °C)
Lower explosion limit	: 0,9 %(V) (118 °C)
Vapour pressure	: 0,015 hPa (20 °C)
Relative vapour density	: 6 (25 °C)
Relative density	: Data not available
Density	: 1.220 kg/m ³ (20 °C)

Solubility(ies)

Water solubility	: insoluble, Reacts with water to form carbon dioxide and insoluble polyureas.
Partition coefficient: n-octanol/water	: log Pow: 3,4
Auto-ignition temperature	: > 595 °C
Decomposition temperature	: Data not available

Viscosity

Viscosity, dynamic	: 2.200 mPa.s (estimated value(s) 20 °C)
Viscosity, kinematic	: Data not available
Explosive properties	: Not applicable
Oxidizing properties	: Data not available

9.2 Other information

Surface tension	: Data not available
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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
Molecular weight	: Data not available

SECTION 10: Stability and reactivity

10.1 Reactivity

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

10.2 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 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.

10.3 Possibility of hazardous reactions

Hazardous reactions : Hygroscopic.

10.4 Conditions to avoid

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.

10.5 Incompatible materials

Materials to avoid : Avoid contact with strong oxidizing agents, copper and copper alloys.

10.6 Hazardous decomposition products

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

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degradation.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

- 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

Product:

- 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:

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

Product:

Remarks: Causes skin irritation.

Components:

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m-tolylidene diisocyanate:

Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:

Remarks: Causes eye irritation.

Components:

m-tolylidene diisocyanate:

Remarks: Causes eye irritation.

Respiratory or skin sensitisation

Product:

Remarks: May cause sensitisation by inhalation., May cause sensitization by skin contact.

Components:

m-tolylidene diisocyanate:

Remarks: May cause sensitisation by inhalation., May cause sensitization by skin contact.

Germ cell mutagenicity

Product:

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

Components:

m-tolylidene diisocyanate:

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

Carcinogenicity

Product:

Remarks: Suspected of causing cancer.

Components:

m-tolylidene diisocyanate:

Remarks: Suspected of causing cancer.

Material

GHS/CLP Carcinogenicity Classification

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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

Product:

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

Components:

m-tolylidene diisocyanate:

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

STOT - single exposure

Product:

Remarks: May cause respiratory irritation.

Components:

m-tolylidene diisocyanate:

Remarks: May cause respiratory irritation.

STOT - repeated exposure

Product:

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

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Components:

m-tolylidene diisocyanate:

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

Aspiration toxicity

Product:

Not an aspiration hazard.

Components:

m-tolylidene diisocyanate:

Not an aspiration hazard.

Further information

Product:

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

Components:

m-tolylidene diisocyanate:

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

SECTION 12: Ecological information

12.1 Toxicity

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.

Product:

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

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) : EC50 : > 10 - 100 mg/l
Remarks: Harmful

Toxicity to algae (Acute) : EC50 : > 100 mg/l

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toxicity)	Remarks: Practically non toxic:
Toxicity to fish (Chronic toxicity)	: Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)
Toxicity to bacteria (Acute toxicity)	: IC50 : > 100 mg/l Remarks: Practically non toxic:

Components:

m-tolylidene diisocyanate :

Toxicity to fish (Acute toxicity)	: LC50 : > 100 mg/l Remarks: Practically non toxic:
Toxicity to daphnia and other aquatic invertebrates (Acute toxicity)	: EC50 : > 10 - 100 mg/l Remarks: Harmful
Toxicity to algae (Acute toxicity)	: EC50 : > 100 mg/l Remarks: Practically non toxic:
Toxicity to bacteria (Acute toxicity)	: IC50 : > 100 mg/l Remarks: Practically non toxic:
Toxicity to fish (Chronic toxicity)	: Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: Remarks: NOEC/NOEL > 1.0 - <=10 mg/l (based on test data)

12.2 Persistence and degradability

Product:

Biodegradability	: Remarks: Not readily biodegradable.
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Components:

m-tolylidene diisocyanate :

Biodegradability	: Remarks: Not readily biodegradable.
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12.3 Bioaccumulative potential

Product:

Bioaccumulation	: Remarks: Does not bioaccumulate significantly.
Partition coefficient: n-octanol/water	: log Pow: 3,4

Components:

m-tolylidene diisocyanate :

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Bioaccumulation : Remarks: Does not bioaccumulate significantly.

12.4 Mobility in soil

Product:

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

Components:

m-tolylidene diisocyanate :

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

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : 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.

Local legislation

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SECTION 14: Transport information

14.1 UN number

ADR : 2078
IMDG : 2078
IATA : 2078

14.2 Proper shipping name

ADR : TOLUENE DIISOCYANATE
IMDG : TOLUENE DIISOCYANATE
IATA : Toluene diisocyanate

14.3 Transport hazard class

ADR : 6.1
IMDG : 6.1
IATA : 6.1

14.4 Packing group

ADR
Packing group : II
Classification Code : T1
Hazard Identification Number : 60
Labels : 6.1
IMDG
Packing group : II
Labels : 6.1
IATA
Packing group : II
Labels : 6.1

14.5 Environmental hazards

ADR
Environmentally hazardous : no
IMDG
Marine pollutant : no

14.6 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.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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

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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.

SECTION 15: Regulatory information

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

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

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

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

SECTION 16: Other information

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.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup

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DIN = Deutsches Institut für Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HPVS = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Further information

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- | | |
|---|---|
| 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 date 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.