

SAFETY DATA SHEET

According to EC No 1907/2006 as amended as at the date of this SDS

CARADATE 80 (TDI)

Version	Revision Date:	SDS Number:	Date of last issue: 01.11.2023
5.0	30.12.2024	800001001005	Print Date 06.01.2025

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

1.1 Product identifier

Trade name	: CARADATE 80 (TDI)
Product code	: U3713
Registration number EU	: 01-2119454791-34
Synonyms	: Methyl phenylene diisocyanate, TDI 80:20, Toluene 2,4- and 2,6-diisocyanate mixture
CAS-No.	: 26471-62-5

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. Please refer to section 16 and/or the annexes for the registered uses under REACH.
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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.
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This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier.

1.3 Details of the supplier of the safety data sheet

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
Contact for Safety Data Sheet	: sccmsds@shell.com

1.4 Emergency telephone number

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

(In non-emergency situations, the number of the Poison Information Centre is 08-33 12 31)

Other information	: CARADATE is a trademark owned by Shell Trademark Management B.V. and Shell Brands Inc. and used by affiliates of Shell plc.
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Acute toxicity, Category 1, Inhalation	H330: Fatal if inhaled.
Respiratory sensitisation, Category 1	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

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:**

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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.

2.3 Other hazards

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
m-tolylidene diisocyanate	26471-62-5 247-722-4	<= 100

Further information

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Contains:

Chemical name	Identification number	Classification	Concentration (% w/w)
4-methyl-m-phenylene diisocyanate	584-84-9, 209-544-5	Carc.2; H351 Acute Tox.2; H330 Eye Irrit.2; H319 Skin Irrit.2; H315 STOT SE2; H335 Resp. Sens.1; H334 Skin Sens.1; H317 Aquatic Chronic3; H412	>= 80
2-methyl-m-phenylene diisocyanate	91-08-7, 202-039-0	Carc.2; H351 Acute Tox.2; H330 Eye Irrit.2; H319 Skin Irrit.2; H315 STOT SE2; H335 Resp. Sens.1; H334 Skin Sens.1; H317 Aquatic Chronic2; H412	<= 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.

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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.
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 breathe.

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 fight-

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ers.

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 fire-fighting : 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.

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

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environment occurs or is likely to occur.
Local authorities should be advised if significant spillages cannot be contained.

6.1.1 For non emergency personnel:
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.

6.1.2 For emergency responders:
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 material 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.
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

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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

7.1 Precautions for safe handling

- | | |
|-------------------------|--|
| Technical measures | : <ul style="list-style-type: none">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 | : <ul style="list-style-type: none">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. |

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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.

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

7.2 Conditions for safe storage, including any incompatibilities

Storage period : 6 Months

Recommended storage temperature : 18 - 25 °C

64 - 77 °F

Further information on storage stability : 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.

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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) : Please refer to section 16 and/or the annexes for the registered uses under REACH.
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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
m-tolylidene diisocyanate	26471-62-5	NGV	0,002 ppm	AFS 2023:14

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	Further information: Substance is sensitizing.			
m-tolylidene diisocyanate		KGV	0,005 ppm	AFS 2023:14
	Further information: Substance is sensitizing.			
m-tolylidene diisocyanate		NGV	0,002 ppm 0,014 mg/m3	AFS 2023:14
	Further information: Substance is carcinogenic., Substance is sensitizing.			
m-tolylidene diisocyanate		KGV	0,005 ppm 0,04 mg/m3	AFS 2023:14
	Further information: Substance is carcinogenic., Substance is sensitizing.			
4-methyl-m-phenylene diisocyanate	584-84-9	NGV	0,002 ppm	AFS 2023:14
	Further information: Substance is sensitizing.			
4-methyl-m-phenylene diisocyanate		KGV	0,005 ppm	AFS 2023:14
	Further information: Substance is sensitizing.			
4-methyl-m-phenylene diisocyanate		NGV	0,002 ppm 0,014 mg/m3	AFS 2023:14
	Further information: Substance is carcinogenic., Substance is sensitizing.			
4-methyl-m-phenylene diisocyanate		KGV	0,005 ppm 0,04 mg/m3	AFS 2023:14
	Further information: Substance is carcinogenic., Substance is sensitizing.			
4-methyl-m-phenylene diisocyanate		KGV	0,005 ppm 0,04 mg/m3	AFS 2023:14
	Further information: Sensitizing substances that can cause allergy or other hypersensitivity in the skin., Sensitizing substances that can cause allergy or other hypersensitivity in the upper and lower respiratory tract., Substance is carcinogenic.			
4-methyl-m-phenylene diisocyanate		NGV	0,002 ppm 0,014 mg/m3	AFS 2023:14
	Further information: Sensitizing substances that can cause allergy or other hypersensitivity in the skin., Sensitizing substances that can cause allergy or other hypersensitivity in the upper and lower respiratory tract., Substance is carcinogenic.			
2-methyl-m-phenylene diisocyanate	91-08-7	NGV	0,002 ppm	AFS 2023:14
	Further information: Substance is sensitizing.			
2-methyl-m-phenylene diisocyanate		KGV	0,005 ppm	AFS 2023:14
	Further information: Substance is sensitizing.			
2-methyl-m-phenylene diisocyanate		NGV	0,002 ppm 0,014 mg/m3	AFS 2023:14

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	Further information: Substance is carcinogenic., Substance is sensitizing.			
2-methyl-m-phenylene diisocyanate		KGV	0,005 ppm 0,04 mg/m3	AFS 2023:14
	Further information: Substance is carcinogenic., Substance is sensitizing.			
2-methyl-m-phenylene diisocyanate		NGV	0,002 ppm 0,014 mg/m3	AFS 2023:14
	Further information: Sensitizing substances that can cause allergy or other hypersensitivity in the skin., Sensitizing substances that can cause allergy or other hypersensitivity in the upper and lower respiratory tract., Substance is carcinogenic.			
2-methyl-m-phenylene diisocyanate		KGV	0,005 ppm 0,04 mg/m3	AFS 2023:14
	Further information: Sensitizing substances that can cause allergy or other hypersensitivity in the skin., Sensitizing substances that can cause allergy or other hypersensitivity in the upper and lower respiratory tract., Substance is carcinogenic.			

Biological occupational exposure limits

No biological limit allocated.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
CARADATE 80 (TDI), 26471-62-5	Workers	Inhalation	Acute systemic effects	0,14 mg/m3
CARADATE 80 (TDI), 26471-62-5	Workers	Inhalation	Acute local effects	0,14 mg/m3
CARADATE 80 (TDI), 26471-62-5	Workers	Inhalation	Long-term systemic effects	0,035 mg/m3
CARADATE 80 (TDI), 26471-62-5	Workers	Inhalation	Long-term local effects	0,035 mg/m3

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
CARADATE 80 (TDI), 26471-62-5	Fresh water	0,013 mg/l
CARADATE 80 (TDI), 26471-62-5	Marine water	0,00125 mg/l
CARADATE 80 (TDI), 26471-62-5	Soil	> 1 mg/kg
CARADATE 80 (TDI), 26471-62-5	Sewage treatment plant	> 1 mg/l

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.
Use sealed systems as far as possible.
Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

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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.

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex.

The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

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.

Approved to EU Standard EN166.

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

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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.
Protective clothing approved to EU Standard EN14605.

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 meeting EN14387 and EN143 [Filter type A/P for use against certain organic gases and vapours with a boiling point >65°C (149°F) and for use against particles].

Thermal hazards : Not applicable

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: Liquid.
Colour	: Pale yellow
Odour	: Sharp, pungent
Odour Threshold	: 0,2 ppm
Melting / freezing point	: 10 °C
Boiling point/boiling range	: 252 - 254 °C (1013,0 hPa)
Flammability	
Flammability (solid, gas)	: Not applicable

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Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit /
upper flammability limit : 9,5 %(V)
(150 °C)

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

Flash point : 132 °C

Auto-ignition temperature : > 595 °C

Decomposition temperature
Decomposition temperature : Data not available

pH : Not applicable

Viscosity

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

Viscosity, kinematic : Data not available

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

Vapour pressure : 0,015 hPa (20 °C)

Relative density : Data not available

Density : 1.220 kg/m³ (20 °C)
Method: ASTM D4052

Relative vapour density : 6 (25 °C)

Particle characteristics

Particle size : Data not available

9.2 Other information

Explosive properties : Not applicable

Oxidizing properties : Data not available

Evaporation rate : 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
Surface tension	:	Data not available
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.

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10.6 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.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

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.

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.

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Germ cell mutagenicity

Components:

m-tolylidene diisocyanate:

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

Germ cell mutagenicity- Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity

Components:

m-tolylidene diisocyanate:

Remarks : Suspected of causing cancer.

Carcinogenicity - Assessment : May cause 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:

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

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

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

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Components:

m-tolylidene diisocyanate:

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

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SECTION 12: Ecological information

12.1 Toxicity

Components:

m-tolylidene diisocyanate:

Toxicity to fish	:	LC50 : > 100 mg/l Remarks: Practically non toxic:
Toxicity to daphnia and other aquatic invertebrates	:	EC50 : > 10 - 100 mg/l Remarks: Harmful
Toxicity to algae/aquatic plants	:	EC50 : > 100 mg/l Remarks: Practically non toxic:
Toxicity to microorganisms	:	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

Components:

m-tolylidene diisocyanate:

Biodegradability	:	Remarks: Not readily biodegradable.
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12.3 Bioaccumulative potential

Components:

m-tolylidene diisocyanate:

Bioaccumulation	:	Remarks: Does not bioaccumulate significantly.
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12.4 Mobility in soil

Components:

m-tolylidene diisocyanate:

Mobility	:	Remarks: If it enters soil, it will adsorb to soil particles and will not be mobile.
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12.5 Results of PBT and vPvB assessment

Components:

m-tolylidene diisocyanate:

Assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB..

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

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. Disposal, transport, storage and handling should be in accordance with SE regulation Avfallsförordning (2011:927).
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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Packing: Emptying: Place the package upside down, and tilt slightly, circa 10 degrees, to enable drainage in such a way that the lowest part of the package is at the exit orifice. On some packing an extra hole must be made. Drainage should be carried out at room temperature (at least 15 °C). Wait until the package is drip dry. Do not close package after draining. Please note the risks connected with emptying package and containers with flammable liquids. Emptied package should be ventilated in a safe place away from sparks and fire. Residues may be an explosion risk. Do not puncture, cut or weld in non-cleaned package, containers or drums.

Local legislation
Remarks

: Suggestion for emptied package:
15 01 02: Plastic packaging
15 01 04 metallic packaging.
Packages containing any remaining product and which have not been emptied until drip dry, must be handled as dangerous waste and must be well sealed before disposal.
Suggestion for waste code:
15 01 10: Packaging containing residues of or contaminated by dangerous substances

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	2078
RID	:	2078
IMDG	:	2078
IATA	:	2078

14.2 UN proper shipping name

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

14.3 Transport hazard class(es)

ADR	:	6.1
RID	:	6.1
IMDG	:	6.1
IATA	:	6.1

14.4 Packing group

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ADR

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

RID

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
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RID

Environmentally hazardous	:	no
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IMDG

Marine pollutant	:	no
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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.
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14.7 Maritime transport in bulk according to IMO instruments

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

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.
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Transport in bulk according to Annex II of Marpol and the IBC Code

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SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation (Annex XIV)	:	Product is not subject to Authorisation under REACH.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

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:

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

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations

AFS 2023:14	:	Sweden. Occupational Exposure Limit Values, AFS 2023:14
AFS 2023:14 / NGV	:	Time Weighted Average
AFS 2023:14 / KGV	:	Short Term Exposure Limit

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ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

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

Other information : For Industry guidance and tools on REACH please visit the CEFIC website at <http://cefic.org/Industry-support>.
The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

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).

Identified Uses according to the Use Descriptor System Uses - Worker

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Title : Formulation & (re)packing of substances and mixtures
- Industrial

Uses - Worker

Title : Flexible Foam Applications
- Industrial

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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Exposure Scenario - Worker

300000000982	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	Sector of Use: SU3, SU10 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9, PROC 15 Environmental Release Categories: ERC2
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2		OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1		Control of Worker Exposure	
Product Characteristics			
Physical form of product		Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article		Covers use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use			
Covers daily exposures up to 8 hours (unless stated differently).			
Other Operational Conditions affecting Exposure			
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.			
Contributing Scenarios		Risk Management Measures	
General risk management measures applicable to all activities		Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.	
General exposures (closed systems)		No other specific measures identified.	
General exposures (closed systems)General measures (skin irritants).		Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.	

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General exposures (closed systems)Use in contained batch processes	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Batch processes at elevated temperatures	Formulate in enclosed or ventilated mixing vessels. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a full face respirator TM3 conforming to EN12942 with Type A/P2 filter or better.
Mixing operations (open systems)	Provide extraction ventilation at points where emissions occur. Wear a full face respirator TM3 conforming to EN12942 with Type A/P2 filter or better.
Process sampling	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Bulk transfersDedicated facility	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Drum/batch transfersDedicated facility	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Drum and small package filling	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter

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	or better.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Equipment cleaning and maintenanceDedicated facility	Drain down and flush system prior to equipment opening or maintenance. Transfer via enclosed lines. Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Storage.	Store substance within a closed system.
Section 2.2	Control of Environmental Exposure
Substance is a unique structure.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	1
Regional use tonnage (tonnes/year):	3,2E+04
Fraction of Regional tonnage used locally:	0,3125
Annual site tonnage (tonnes/year):	1,0E+04
Maximum daily site tonnage (kg/day):	3,3E+04
Frequency and Duration of Use	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	3,0E-04
Release fraction to wastewater from process (initial release prior to RMM):	0
Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
Wastewater emission controls are not applicable as there is no direct release to wastewater.	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0

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Organisational measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Conditions and Measures related to municipal sewage treatment plant	
Wastewater emission controls are not applicable as there is no direct release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1,1E+09
Assumed domestic sewage treatment plant flow (m3/d)	0
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
Measured data have been used to estimate exposure.	

Section 3.2 -Environment	
Used EUSES model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	

Section 4.2 -Environment	
Not applicable.	

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Exposure Scenario - Worker

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SECTION 1	EXPOSURE SCENARIO TITLE
Title	Flexible Foam Applications- Industrial
Use Descriptor	Sector of Use: SU3 Process Categories: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 14, PROC 15, PROC 21 Environmental Release Categories: ERC2, ERC3, ERC 6C
Scope of process	Covers material transfers, mixing, pouring or compression during open or closed moulding or slabstock operations, laboratory use, equipment cleaning and maintenance.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1	Control of Worker Exposure	
Product Characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article	Covers use of substance/product up to 100% (unless stated differently).,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes use at not more than 20°C above ambient temperature (unless stated differently). Assumes a good basic standard of occupational hygiene is implemented.		
Contributing Scenarios		Risk Management Measures
General risk management measures applicable to all activities		Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
General exposures (closed systems)		No other specific measures identified.
General exposures (closed systems)Continuous processGeneral measures (skin irritants).		Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
General exposures (closed		Provide extraction ventilation at points where emissions oc-

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systems)Use in contained batch processes	cur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
General exposures (open systems)	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Mixing operations (open systems)	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a full face respirator TM3 conforming to EN12942 with Type A/P2 filter or better.
Process sampling	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Bulk transfersDedicated facility	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Drum/batch transfersDedicated facility	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Injection moulding of articles(closed systems)	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Injection moulding of articles(open systems)	Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE:

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	Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Production or preparation or articles by tableting, compression, extrusion or pelletisation	Provide extraction ventilation at points where emissions occur. Wear a full face respirator TM3 conforming to EN12942 with Type A/P2 filter or better. Limit the substance content in the product to 85%.
Low energy manipulation of substances bound in materials and/or articles.	Provide extraction ventilation at points where emissions occur. Wear a respirator conforming to EN140 with Type A filter or better. Limit the substance content in the product to 1 %.
Low energy manipulation of substances bound in materials and/or articles.elevated temperature	Provide extraction ventilation at points where emissions occur. Wear a respirator conforming to EN140 with Type A filter or better. Limit the substance content in the product to 1 %.
Laboratory activities	Handle in a fume cupboard or under extract ventilation.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Transfer via enclosed lines. Provide extraction ventilation at points where emissions occur. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Section 2.2	Control of Environmental Exposure
Substance is a unique structure.	
Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	1
Regional use tonnage (tonnes/year):	4,48E+05
Fraction of Regional tonnage used locally:	0,0223
Annual site tonnage (tonnes/year):	1,0E+04
Maximum daily site tonnage (kg/day):	3,3E+04
Frequency and Duration of Use	
Emission Days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other Operational Conditions affecting Environmental Exposure	
Release fraction to air from process (initial release prior to RMM):	9,0E-05
Release fraction to wastewater from process (initial release prior to RMM):	0

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Release fraction to soil from process (initial release prior to RMM):	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process re-release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of >= (%)	0
Wastewater emission controls are not applicable as there is no direct release to wastewater.	
If discharging to domestic sewage treatment plant, no secondary wastewater treatment required.	0
Organisational measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Conditions and Measures related to municipal sewage treatment plant	
Wastewater emission controls are not applicable as there is no direct release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)Not applicable.	1,1E-09
Assumed domestic sewage treatment plant flow (m3/d)	0
Conditions and Measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or regional regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or regional regulations.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
Measured data have been used to estimate exposure.	

Section 3.2 -Environment	
Used EUSES model.	

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	

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Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Section 4.2 -Environment

Not applicable.