Safety data sheet

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 PRODUCT IDENTIFIER

Product name

MITOPUR E45

UFI:

AT1E-4KVF-111G-S8JJ

https://my.chemius.net/p/03cMiN/en/pd/en

1.2 RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Relevant identified uses

One-component adhesive / primer / sealant for industrial, professional and consumer end-use.

Uses advised against

Application with spray is not allowed for general public.

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Manufacturer

MITOL, tovarna lepil, d.o.o., Sežana
Partizanska c. 78
6210 Sežana, Slovenia
+386 5 73 12 300 (8:00-16:00)
lilijana.kocjan@mitol.si

1.4 EMERGENCY TELEPHONE NUMBER

Emergency

112

Manufacturer

+386 5 73 12 300 (8:00-16:00)

SECTION 2: HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Classification according to Regulation (EC) No 1272/2008 (CLP)

Skin Irrit. 2; H315 Causes skin irritation.
Skin Sens. 1; H317 May cause an allergic skin reaction.
Eye Irrit. 2; H319 Causes serious eye irritation.
Acute Tox. 4; H332 Harmful if inhaled.
Resp. Sens. 1; H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
STOT SE 3; H335 May cause respiratory irritation.
Carc. 2; H351 Suspected of causing cancer.
STOT RE 2; H373 May cause damage to organs through prolonged or repeated exposure.
Aquatic Chronic 3; H412 Harmful to aquatic life with long lasting effects.

2.2 LABEL ELEMENTS

Labelling according to Regulation (EC) No 1272/2008 [CLP]



Signal word: DANGER
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
H412 Harmful to aquatic life with long lasting effects.
P102 Keep out of reach of children.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/eye protection/face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501 Dispose of contents/container in accordance with national regulation.

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Contains:

Aromatic Polyisocyanate-Prepolymer
diphenylmethane diisocyanate, isomers and homologues
diphenylmethane-2,4'-diisocyanate
'4,4'-methylenediphenyl diisocyanate

Special provisions

Persons already sensitised to diisocyanates may develop allergic reactions when using this product. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product. This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (i.e. type A1 according to standard EN 14387) is used.
As from 24 August 2023 adequate training is required before industrial or professional use.

2.3 OTHER HAZARDS

PBT/vPvB

No information.

Endocrine disrupting properties

The product does not contain substances with the potential for endocrine disorders.

Additional information

Persons who have problems with sensitivity of the airways (asthma, chronic bronchitis), should avoid contact with the product.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 SUBSTANCES

For mixtures see 3.2.

3.2 MIXTURES

Name	CAS EC Index Reach	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
Aromatic Polyisocyanate-Prepolymer	67815-87-6 - -	40-60	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 STOT RE 2; H373	/	/
diphenylmethane diisocyanate, isomers and homologues	9016-87-9 618-498-9 615-005-00-9	30-40	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 Carc. 2; H351 STOT RE 2; H373	/	/

Name	CAS EC Index Reach	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
diphenylmethane-2,4'-diisocyanate	5873-54-1 227-534-9 615-005-00-9 01-2119480143-45	2,5-5	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 Carc. 2; H351 STOT RE 2; H373	Skin Irrit. 2; H315; C ≥ 5% Eye Irrit. 2; H319; C ≥ 5% Resp. Sens. 1; H334; C ≥ 0.1% STOT SE 3; H335; C ≥ 5%	C
'4,4'-methylenediphenyl diisocyanate	101-68-8 202-966-0 615-005-00-9 01-2119457014-47	2,5-5	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 Carc. 2; H351 STOT RE 2; H373	Skin Irrit. 2; H315; C ≥ 5% Eye Irrit. 2; H319; C ≥ 5% Resp. Sens. 1; H334; C ≥ 0.1% STOT SE 3; H335; C ≥ 5%	C
bis(isopropyl)naphthalene	38640-62-9 254-052-6 - 01-2119565150-48	<0,9	Asp. Tox. 1; H304 Aquatic Chronic 1; H410; M = 1	/	/
'2,2'-methylenediphenyl diisocyanate	2536-05-2 219-799-4 615-005-00-9 01-2119927323-43	<0,1	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 4; H332 Resp. Sens. 1; H334 STOT SE 3; H335 Carc. 2; H351 STOT RE 2; H373	Skin Irrit. 2; H315; C ≥ 5% Eye Irrit. 2; H319; C ≥ 5% Resp. Sens. 1; H334; C ≥ 0.1% STOT SE 3; H335; C ≥ 5%	C

Notes for substances

C	Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers.

Product description

Polyisocyanate based on diphenylmethane diisocyanate.

SECTION 4: FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

General notes

Never give anything by mouth to an unconscious person. Place patient in recovery position and ensure airway patency.

Following inhalation

Remove patient to fresh air - move out of dangerous area. If symptoms occur, seek medical advice.

Following skin contact

Immediately remove contaminated clothing. Wash affected skin areas immediately with plenty of water and soap. If possible, rinse with polyethylene glycol 400 and plenty of water. If symptoms persist, seek medical attention.

Following eye contact

Immediately flush eyes with running water, keeping eyelids apart. Seek medical help.

Following ingestion

Do not induce vomiting! Consult a physician. Show the physician the safety data sheet or label.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Following inhalation

Harmful. Can cause sensitization. Coughing, sneezing, nasal discharge, labored breathing.

Following skin contact

Causes irritation of mucous membrane. May cause sensitisation by skin contact (symptoms: itching, redness, rashes).

Following eye contact

Redness, tearing, pain.

Following ingestion

Irritates mucous membranes in the mouth, throat, esophagus and in gastrointestinal area.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

Product is irritating to the respiratory tract and may cause skin and respiratory tract sensitization. Treatment of acute irritation or narrowing of the bronchial tubes is carried out mainly symptomatic. Depending on the degree of exposure and severity of symptoms additional treatment may be required.

SECTION 5: FIREFIGHTING MEASURES

5.1 EXTINGUISHING MEDIA

Suitable extinguishing media

Carbon dioxide (CO_2).
Foam.
Fire extinguishing powder. Fight larger fires with water spray.

Unsuitable extinguishing media

Full water jet.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Hazardous combustion products

In the event of fire the following can be generated: carbon monoxide (CO), carbon dioxide (CO_2). In the event of fire the following is released: nitrogen oxides (NOx).
Vapours of Isocyanates.
Hydrogen cyanide (HCN).

5.3 ADVICE FOR FIREFIGHTERS

Protective actions

In case of fire or heating do not breathe fumes/vapours. Cool containers at risk with water spray. If possible remove containers from endangered area.

Special protective equipment for fire-fighters

Firefighters should wear appropriate protective clothing for firefighters (including helmets, protective boots and gloves) (EN 469) and self-contained breathing apparatus (SCBA) with a full face-piece (EN 137).

Additional information

Contaminated firefighting water must be disposed of in accordance with the regulations; do not allow to reach the sewage system. Contaminated firefighting water and fire residues must be disposed of in accordance with the local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

For non-emergency personnel

Protective equipment

Use personal protective equipment (Section 8).

Precautionary measures

Ensure adequate ventilation. Keep away from sources of ignition and/or heat; No smoking!

Emergency procedures

Prevent access to unauthorised personnel.

For emergency responders

No information.

6.2 ENVIRONMENTAL PRECAUTIONS

Do not allow product to reach water/drains/sewage systems or permeable soil. If accidental large entry into water or ground occurs, inform responsible authorities.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

For containment

No information.

For cleaning up

Remove mechanically; cover residues with wet material (eg. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour collect in a waste container, which should not be closed (CO_2 formation!). Keep wet in a safe ventilated area. Spillage area can be decontaminated with a solution for neutralization. The solution for decontamination (not flammable): 5% of sodium carbonate and 95% water. You can also use: yellow liquid soap (potassium soap with approx. 15% anionic surfactants): 20 ml + Water 700 ml + PEG 400: 350 ml.

Other information

No information.

6.4 REFERENCE TO OTHER SECTIONS

See also sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Protective measures

Measures to prevent fire

Ensure adequate ventilation. The usual measures for preventive fire protection.

Measures to prevent aerosol and dust generation

Use general or local exhaust ventilation to prevent inhaling high concentrations of vapours and aerosols.

Measures to protect the environment

Avoid release to the environment. Do not discharge into drains, surface water and soil. After use immediately close container tightly.

Other measures

No information.

Advice on general occupational hygiene

Use good personal hygiene practices – wash hands at breaks and when done working with material. Do not eat, drink or smoke while working. Avoid contact with skin, eyes and clothes. Product is not for eating – do not ingest! Do not breathe vapours/mist. Remove contaminated clothes and wash them before reuse. Contaminated work clothing should not be allowed out of the workplace. Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. For the use of the product, a suitable training for working with diisocyanates is required.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Technical measures and storage conditions

Keep in a locked place. Storage temperature: +5 - 25 ° C. Keep in tightly closed container. Store in a dry, cool and well-ventilated area, away from incompatible materials. Protect from direct sunlight. Keep away from food, drink and animal feeding stuffs.

Packaging materials

Store only in original container. Keep in containers of the same material as the original one.

Requirements for storage rooms and vessels

Do not store in unlabelled containers. Close opened containers after use. Put the containers upright to prevent from leaking. Contact with moisture initiates a cross-linking reaction, releasing carbon dioxide gas.

Storage class

No information.

Further information on storage conditions

No information.

7.3 SPECIFIC END USE(S)

Recommendations

No information.

Industrial sector specific solutions

No information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Occupational Exposure limit values

Name	mg/m³	ml/m³	Short-term value mg/m³	Short-term value ml/m³	Remark	Biological Tolerance Values
'4,4'-methylenediphenyl diisocyanate	0.07	/	/	/	STEL, EH40/2005 WELs (United Kingdom (UK), 8/2007). Skin sensitiser. (as NCO) 15 minute(s).	/
'4,4'-methylenediphenyl diisocyanate	0.05	/	/	/	TWA	/
'4,4'-methylenediphenyl diisocyanate	0.02	/	/	/	TWA, EH40/2005 WELs (United Kingdom (UK), 8/2007). Skin sensitiser. (as NCO) 8 hour(s).	/

Information on monitoring procedures

BS EN 14042:2003 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. BS EN 689:2018 Workplace exposure. Measurement of exposure by inhalation to chemical agents. Strategy for testing compliance with occupational exposure limit values. BS EN 482:2021 Workplace exposure. Procedures for the determination of the concentration of chemical agents. Basic performance requirements.

DNEL/DMEL values

For product

No information.

For components

Name	Type	Exposure route	exp. frequency	Remark	value
'4,4'-methylenediphenyl diisocyanate	Worker	dermal	short term systemic effects	24 h	50 mg/kg
'4,4'-methylenediphenyl diisocyanate	Worker	inhalation	short term systemic effects	/	0.1 mg/m³
'4,4'-methylenediphenyl diisocyanate	Worker	dermal	short term systemic effects	/	28.7 mg/cm²
'4,4'-methylenediphenyl diisocyanate	Worker	inhalation	short term systemic effects	/	0.1 mg/m³
'4,4'-methylenediphenyl diisocyanate	Worker	inhalation	long term systemic effects	/	0.05 mg/m³
'4,4'-methylenediphenyl diisocyanate	Worker	inhalation	long term systemic effects	/	0.05 mg/m³
'4,4'-methylenediphenyl diisocyanate	Consumer	dermal	short term systemic effects	mg/kg per day	25 mg/kg

Name	Type	Exposure route	exp. frequency	Remark	value
'4,4'-methylenediphenyl diisocyanate	Consumer	inhalation	short term systemic effects	/	0.05 mg/m³
'4,4'-methylenediphenyl diisocyanate	Consumer	oral	short term systemic effects	mg/kg per day	20 mg/kg
'4,4'-methylenediphenyl diisocyanate	Consumer	dermal	short term local effects	/	17.2 mg/cm²
'4,4'-methylenediphenyl diisocyanate	Consumer	inhalation	short term local effects	/	0.05 mg/m³
'4,4'-methylenediphenyl diisocyanate	Consumer	inhalation	long term systemic effects	systemic	0.025 mg/m³
'4,4'-methylenediphenyl diisocyanate	Consumer	inhalation	long term local effects	/	0.025 mg/m³
'2,2'-methylenediphenyl diisocyanate	Worker	dermal	short term local effects	/	28.7 mg/cm²
'2,2'-methylenediphenyl diisocyanate	Worker	dermal	short term systemic effects	mg/kg per day	50 mg/kg
'2,2'-methylenediphenyl diisocyanate	Worker	inhalation	long term local effects	/	0.05 mg/m³
'2,2'-methylenediphenyl diisocyanate	Worker	inhalation	long term systemic effects	/	0.05 mg/m³
'2,2'-methylenediphenyl diisocyanate	Worker	inhalation	short term local effects	/	0.1 mg/m³
'2,2'-methylenediphenyl diisocyanate	Worker	inhalation	short term systemic effects	/	0.1 mg/m³
'2,2'-methylenediphenyl diisocyanate	Consumer	dermal	short term systemic effects	/	25 mg/kg bw/day
'2,2'-methylenediphenyl diisocyanate	Consumer	inhalation	short term systemic effects	/	0.05 mg/m³
'2,2'-methylenediphenyl diisocyanate	Consumer	oral	short term systemic effects	/	20 mg/kg bw/day
'2,2'-methylenediphenyl diisocyanate	Consumer	dermal	short term local effects	/	17.2 mg/cm²
'2,2'-methylenediphenyl diisocyanate	Consumer	inhalation	short term local effects	/	0.05 mg/m³

Name	Type	Exposure route	exp. frequency	Remark	value
'2,2'-methylenediphenyl diisocyanate	Consumer	inhalation	long term systemic effects	/	0.025 mg/m³
'2,2'-methylenediphenyl diisocyanate	Consumer	inhalation	long term local effects	/	0.025 mg/m³
diphenylmethane-2,4'-diisocyanate	Worker	dermal	short term local effects	/	28.7 mg/cm²
diphenylmethane-2,4'-diisocyanate	Worker	dermal	short term systemic effects	mg/kg per day	50 mg/kg
diphenylmethane-2,4'-diisocyanate	Worker	inhalation	long term local effects	/	0.05 mg/m³
diphenylmethane-2,4'-diisocyanate	Worker	inhalation	long term systemic effects	/	0.05 mg/m³
diphenylmethane-2,4'-diisocyanate	Worker	inhalation	short term local effects	/	0.1 mg/m³
diphenylmethane-2,4'-diisocyanate	Worker	inhalation	short term systemic effects	/	0.1 mg/m³
diphenylmethane-2,4'-diisocyanate	Consumer	dermal	short term systemic effects	/	25 mg/kg bw/day
diphenylmethane-2,4'-diisocyanate	Consumer	inhalation	short term systemic effects	/	0.05 mg/m³
diphenylmethane-2,4'-diisocyanate	Consumer	oral	short term systemic effects	/	20 mg/kg bw/day
diphenylmethane-2,4'-diisocyanate	Consumer	dermal	short term local effects	/	17.2 mg/cm²
diphenylmethane-2,4'-diisocyanate	Consumer	inhalation	short term local effects	/	0.05 mg/m³
diphenylmethane-2,4'-diisocyanate	Consumer	inhalation	long term systemic effects	/	0.025 mg/m³
diphenylmethane-2,4'-diisocyanate	Consumer	inhalation	long term local effects	/	0.025 mg/m³

PNEC values

For product

No information.

For components

Name	Exposure route	Remark	value

Name	Exposure route	Remark	value
'4,4'-methylenediphenyl diisocyanate	fresh water	/	1 mg/L
'4,4'-methylenediphenyl diisocyanate	marine water	/	0.1 mg/L
'4,4'-methylenediphenyl diisocyanate	soil	/	1 mg/kg
'4,4'-methylenediphenyl diisocyanate	water, intermittent release	/	10 mg/L
'4,4'-methylenediphenyl diisocyanate	water treatment plant	/	1 mg/L
'2,2'-methylenediphenyl diisocyanate	soil	/	1 mg/kg
'2,2'-methylenediphenyl diisocyanate	fresh water	/	1 mg/L
'2,2'-methylenediphenyl diisocyanate	marine water	/	0.1 mg/L
'2,2'-methylenediphenyl diisocyanate	water treatment plant	/	1 mg/L
diphenylmethane-2,4'-diisocyanate	soil	/	1 mg/kg
diphenylmethane-2,4'-diisocyanate	fresh water	/	1 mg/L
diphenylmethane-2,4'-diisocyanate	marine water	/	0.1 mg/L
diphenylmethane-2,4'-diisocyanate	water treatment plant	/	1 mg/L

8.2 EXPOSURE CONTROLS

Appropriate engineering control

Substance/mixture related measures to prevent exposure during identified uses

Use good personal hygiene practices – wash hands at breaks and when done working with material. Avoid contact with eyes and skin. Do not breathe vapours/aerosols. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke while working.

Structural measures to prevent exposure

No information.

Organisational measures to prevent exposure

No information.

Technical measures to prevent exposure

Provide good ventilation and local exhaust in areas with increased concentration.

Personal protective equipment

Eye and face protection

Safety glasses with side protection (BS EN ISO 16321-1:2022).

Hand protection

Protective gloves (BS EN ISO 374). Observe the manufacturer's instructions regarding the use, storage, maintenance and replacement of gloves. In case of damage or at the first signs of wear and tear, change the gloves immediately.

Appropriate materials

Material	Thickness	Penetration Time	Remark
chloroprene rubber	0.5 mm	480 min	BS EN ISO 374
Nitrile	0.35 mm	480 min	BS EN ISO 374
Butyl rubber	0.5 mm	480 min	BS EN ISO 374
Viton (fluorinated rubber)	0.4 mm	480 min	BS EN ISO 374

Skin protection

Cotton protective clothing and shoes that cover the entire foot (EN ISO 20345:2022).

Respiratory protection

In case of insufficient ventilation wear suitable respiratory protection. Wear suitable protective breathing mask (BS EN 136) with filter A2-P2 (BS EN 14387).

Thermal hazards

No information.

Environmental exposure controls

Substance/mixture related measures to prevent exposure

No information.

Instruction measures to prevent exposure

No information.

Organisational measures to prevent exposure

No information.

Technical measures to prevent exposure

No information.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Important health, safety and environmental information

Physical state	liquid
Shape	No information.
Colour	brown
Odour	characteristic
Odour threshold	No information.
Melting/freezing point or softening point	No information.
Boiling point or initial boiling point and boiling range	> 300 °C at 1013 hPa
Flammability (solid, gas)	> 400 °C
Explosion limits (vol%)	No information.
Flash point	> 210 °C
Auto-ignition temperature	No information.
Decomposition temperature	No information.
pH	substance/mixture reacts with water
Viscosity (dynamic)	< 5500 mPas at 25 °C (DIN 53019)
Solubility (Water)	insoluble
Partition coefficient n-octanol/water (log value)	No information.
Vapour pressure	< 17 hPa at 20 °C (EG A4) < 39 hPa at 55 °C
Density	> 1.1 g/cm^3 at 20 °C (DIN 53217)
Relative vapour/gas density	No information.
Particle characteristics	No information.

9.2 OTHER INFORMATION

Information with regard to physical hazard classes

No information.

Other safety characteristics

No information.

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

No information.

10.2 CHEMICAL STABILITY

Product is stable under normal conditions of use, recommended handling and storage conditions.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

Product reacts slowly with water, releasing CO_2, which can cause overpressure in closed containers. Danger of explosion.

10.4 CONDITIONS TO AVOID

No special precautions required. Consider the directions for use and storage. Do not expose to temperatures above 200°C.

10.5 INCOMPATIBLE MATERIALS

Amines.
Alcohols. Exothermic reaction with amines and alcohols.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

Under normal use conditions no hazardous decomposition products are expected. In case of fire/explosion vapours/gases that pose a health hazard are released.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON HAZARD CLASSES AS DEFINED IN REGULATION (EC) NO 1272/2008

(a) Acute toxicity

For product

Exposure route	Type	Species	Time	value	Method	Remark
oral	LD_{50}	rat	/	> 5000 mg/kg	/	/

For components

Name	Exposure route	Type	Species	Time	value	Method	Remark
'4,4'-methylenediphenyl diisocyanate	oral	LD_{50}	rat (male)	/	> 10000 mg/kg	/	/
'4,4'-methylenediphenyl diisocyanate	dermal	LD_{50}	rabbit	/	> 9400 mg/kg	/	/
'4,4'-methylenediphenyl diisocyanate	inhalation	LC_{50}	rat	4 h	0.368 mg/m3	OECD 403	/
'2,2'-methylenediphenyl diisocyanate	oral	LD_{50}	rat	/	> 2000 mg/kg	/	/
'2,2'-methylenediphenyl diisocyanate	dermal	LD_{50}	rabbit	/	> 9400 mg/kg	/	/
'2,2'-methylenediphenyl diisocyanate	inhalation	LC_{50}	/	4 h	0.527 mg/l	/	dust/aerosol

Name	Exposure route	Type	Species	Time	value	Method	Remark
diphenylmethane-2,4'-diisocyanate	oral	LD_{50}	rat	/	5000 mg/kg	/	/
diphenylmethane-2,4'-diisocyanate	dermal	LD_{50}	rabbit	/	> 9400 mg/kg	/	/
diphenylmethane-2,4'-diisocyanate	inhalation	LC_{50}	rat	4 h	0.387 mg/l	/	vapour

Additional information

Harmful if inhaled.

(b) Skin corrosion/irritation

For components

Name	Species	Time	result	Method	Remark
'4,4'-methylenediphenyl diisocyanate	rabbit	/	Irritating.	OECD 404	/
'2,2'-methylenediphenyl diisocyanate	rabbit	/	Mild irritating.	OECD 404 (Acute Dermal Irritation/Corrosion)	/
diphenylmethane-2,4'-diisocyanate	rabbit	/	Irritating.	OECD 404 (Acute Dermal Irritation/Corrosion)	/

Additional information

Irritating to eyes, respiratory system and skin.

(c) Serious eye damage/irritation

For components

Name	Exposure route	Species	Time	result	Method	Remark
'4,4'-methylenediphenyl diisocyanate	/	rabbit	/	Non-irritant.	OECD 405, GLP	/
'2,2'-methylenediphenyl diisocyanate	/	rabbit	/	Mild irritating.	OECD 405 Acute Eye Irritation/Corrosion	/
diphenylmethane-2,4'-diisocyanate	/	rabbit	/	No irritant effect.	OECD 405 Acute Eye Irritation/Corrosion	/

(d) Respiratory or skin sensitisation

For components

Name	Exposure route	Species	Time	result	Method	Remark
'4,4'-methylenediphenyl diisocyanate	dermal	mouse	/	Sensitizing.	OECD 429 Skin Sensitisation: Local Lymph Node Assay	/
'4,4'-methylenediphenyl diisocyanate	dermal	guinea pig	/	Non sensitising.	OECD 406	/
'4,4'-methylenediphenyl diisocyanate	inhalation	guinea pig	/	Sensitizing.	/	/
'2,2'-methylenediphenyl diisocyanate	dermal	mouse	/	Sensitizing.	OECD 429 Skin Sensitisation: Local Lymph Node Assay	/
'2,2'-methylenediphenyl diisocyanate	inhalation	guinea pig	/	Sensitizing.	/	/
diphenylmethane-2,4'-diisocyanate	dermal	Guinea pig (male/female)	/	Non sensitising.	OECD 406 (Skin Sensitization)	Buehler test
diphenylmethane-2,4'-diisocyanate	dermal	mouse	/	Sensitizing.	OECD 429 Skin Sensitisation: Local Lymph Node Assay	/
diphenylmethane-2,4'-diisocyanate	inhalation	guinea pig	/	Sensitizing.	/	/

Additional information

May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

(e) (Germ cell) mutagenicity

For components

Name	Type	Species	Time	result	Method	Remark
'4,4'-methylenediphenyl diisocyanate	/	Bacteria	/	Negative.	EU EC B.13/14 Mutagenicity - Reverse Mutation Test using Bacteria	/
'4,4'-methylenediphenyl diisocyanate	in-vivo mutagenicity	/	/	Negative.	OECD 474	/

(f) Carcinogenicity

For components

Name	Exposure route	Type	Species	Time	value	result	Method	Remark
'4,4'-methylene diphenyl diisocyanate	inhalation	/	rat	2 years	mg/l	Positive	OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies	5 days per week

(g) Reproductive toxicity

For components

Name	Reproductive toxicity type	Type	Species	Time	value	result	Method	Remark
'4,4'-methylene diphenyl diisocyanate	Teratogenicity	NOAEL	rat (male/female)	/	12 mg/kg	/	OECD 414	Inhalation (vapour)

Summary of evaluation of the CMR properties

Suspected of causing cancer. Product is not classified as mutagenic or toxic for reproduction.

(h) STOT-single exposure

No information.

(i) STOT-repeated exposure

For components

Name	Exposure route	Type	Species	Time	Exposure	organ	value	result	Method	Remark
'4,4'-methylenediphenyl diisocyanate	inhalation (aerosol)	NOAEC	rat	104 weeks	sub-chronic	/	0.2 mg/m³	irritation	OECD 453	6 h per day, 5 days per week
'4,4'-methylenediphenyl diisocyanate	inhalation (aerosol)	LOAEC	rat	104 weeks	sub-chronic	Respiratory tract	1 mg/m³	irritation	OECD 453	6 h per day, 5 days per week
'2,2'-methylenediphenyl diisocyanate	inhalation (aerosol)	NOAEC	rat	104 weeks	sub-chronic	/	0.2 mg/m³	irritation	OECD 453	6 h per day, 5 days per week
'2,2'-methylenediphenyl diisocyanate	inhalation (aerosol)	LOAEC	rat	104 weeks	sub-chronic	Respiratory tract	1 mg/m³	irritation	OECD 453	6 h per day, 5 days per week

Name	Exposure route	Type	Species	Time	Exposure	organ	value	result	Method	Remark
diphenylmethane-2,4'-diisocyanate	inhalation (aerosol)	LOAEC	rat	104 weeks	sub-chronic	Respiratory tract	1 mg/m3	irritation	OECD 453	6 h per day, 5 days per week
diphenylmethane-2,4'-diisocyanate	inhalation (aerosol)	NOAEC	rat	104 weeks	sub-chronic	/	0.2 mg/m3	irritation	OECD 453	6 h per day, 5 days per week

(j) Aspiration hazard

No information.

Symptoms related to the physical, chemical and toxicological characteristics

No information.

Interactive effects

No information.

11.2 INFORMATION ON OTHER HAZARDS

Endocrine disrupting properties

The product does not contain substances with the potential for endocrine disorders.

Other information

No information.

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY

Acute (short-term) toxicity

For product

Type	Exposure time	Species	organism	Method	Remark	value
LC_{50}	96 h	fish	*Brachydanio rerio*	OECD 203	/	> 100 mg/L
EC_{50}	48 h	crustacea	*Daphnia magna*	OECD 202	/	83 mg/L
ErC_{50}	72 h	algae	*Desmodesmus subspicatus*	OECD 201	/	> 100 mg/L

For components

Name	Type	value	Exposure time	Species	organism	Method	Remark
'4,4'-methylenediphenyl diisocyanate	LC_{50}	> 1000 mg/L	96 h	fish	/	OECD 203	/
'4,4'-methylenediphenyl diisocyanate	EC_{50}	> 1000 mg/L	24 h	daphnia	*Daphnia magna*	OECD 202	/
'4,4'-methylenediphenyl diisocyanate	EC_{50}	> 100 mg/L	72 h	algae	/	OECD 201	/

Name	Type	value	Exposure time	Species	organism	Method	Remark
'4,4'-methylenediphenyl diisocyanate	EC_{50}	> 100 mg/kg	3 h	bacteria	/	OECD 209	/
'4,4'-methylenediphenyl diisocyanate	NOEC	> 1000 mg/kg	14 days	Soil macroorganisms	*Eisenia fetida*	OECD TG 207	/
'4,4'-methylenediphenyl diisocyanate	NOEC	> 1000 mg/kg	14 days	Plants	*Avena sativa*	OECD TG 208	/
'4,4'-methylenediphenyl diisocyanate	NOEC	> 1000 mg/kg	14 days	Plants	*Lactuca sativa*	OECD TG 208	/
'2,2'-methylenediphenyl diisocyanate	LC_{50}	> 1000 mg/L	96 h	fish	*Danio rerio*	OECD Guideline 203 (Fish, Acute Toxicity Test)	/
'2,2'-methylenediphenyl diisocyanate	EC_{50}	> 1640 mg/L	72 h	algae	*Scenedesmus subspicatus*	OECD Guideline 201 (Alga, Growth Inhibition Test)	/
'2,2'-methylenediphenyl diisocyanate	EC_{50}	> 100 mg/L	3 h	activated sludge	/	OECD 209 Activated Sludge, Respiration Inhibition Test	/
'2,2'-methylenediphenyl diisocyanate	EC_{50}	> 1000 mg/L	24 h	daphnia	*Daphnia magna*	202 (Daphnia sp. Acute Immobilisation Test)	/
diphenylmethane-2,4'-diisocyanate	LC_{50}	1000 mg/L	96 h	fish	/	/	/

Name	Type	value	Exposure time	Species	organism	Method	Remark
diphenylmethane-2,4'-diisocyanate	EC_{50}	1000 mg/L	48 h	crustacea	/	/	/

Chronic (long-term) toxicity

For components

Name	Type	value	Exposure time	Species	organism	Method	Remark
'4,4'-methylenediphenyl diisocyanate	NOEC	> 10 mg/l	21 days	Magna Daphnia	*Daphnia magna*	OECD 211	/
'2,2'-methylenediphenyl diisocyanate	NOEC	> 10 mg/l	21 days	Magna Daphnia	*Daphnia magna*	OECD 202	/
diphenylmethane-2,4'-diisocyanate	NOEC	> 10 mg/l	21 days	Magna Daphnia	*Daphnia magna*	OECD 202	/

12.2 PERSISTENCE AND DEGRADABILITY

Abiotic degradation, physical- and photo-chemical elimination

For components

Name	Environment	Type / Method	Half Time	Evaluation	Method	Remark
'4,4'-methylenediphenyl diisocyanate	Air	photodegradation	/	slowly	/	/

Biodegradation

For components

Name	Type	Rate	Time	Evaluation	Method	Remark
'4,4'-methylenediphenyl diisocyanate	aerobic	/	/	Non-biodegradable	/	/

Additional information

Contains non readily biodegradable component(s).

12.3 BIOACCUMULATIVE POTENTIAL

Partition coefficient n-octanol/water (log value)

For components

Name	Media	value	Temperature °C	pH	Concentration	Method
'4,4'-methylenediphenyl diisocyanate	Octanol-water (log Pow)	4.51	/	/	/	/

Bioconcentration factor (BCF)

For components

Name	Species	organism	value	Duration	Evaluation	Method	Remark
'4,4'-methylenediphenyl diisocyanate	organism	*Cyprinus carpio*	92 - 200	4 weeks	/	OECD 305	experimental value

Additional information

No bioaccumulation expected.

12.4 MOBILITY IN SOIL

Known or predicted distribution to environmental compartments

No information.

Surface tension

No information.

Adsorption/Desorption

For components

Name	Type	Criterion	value	Evaluation	Method	Remark
'4,4'-methylenediphenyl diisocyanate	Soil	Henry constant (H)	8.9E-7 Pa.m³ / mol	/	/	25 °C

12.5 RESULTS OF PBT AND VPVB ASSESSMENT

The components in this product do not meet the criteria for classification as PBT or vPvB.

12.6 ENDOCRINE DISRUPTING PROPERTIES

The product does not contain substances with the potential for endocrine disorders.

12.7 OTHER ADVERSE EFFECTS

No information.

12.8 ADDITIONAL INFORMATION

For product

Do not allow to reach ground water, water courses or sewage system. Isocyanates react with water to form an insoluble polyurea.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Product / Packaging disposal

Waste chemical

Do not allow product to reach drains/sewage systems. Any disposal in the environment or discharging into water is prohibited. Disposal must be made according to official regulations: deliver it to authorised collector/remover/transformer of hazardous waste. Dispose of in accordance with applicable waste disposal regulation.

Waste codes / waste designations according to LoW

08 04 09* - waste adhesives and sealants containing organic solvents or other dangerous substances

Packaging

Packing must be completely emptied. Empty container is not suitable for reuse. Uncleaned / not emptied containers are classified as hazardous waste - they should be handled in the same manner as the contents. Deliver completely emptied containers to approved waste disposal authorities. Dispose of in accordance with applicable waste disposal regulation.

Waste codes / waste designations according to LoW

15 01 02 - plastic packaging
15 01 04 - metallic packaging
15 01 10* - packaging containing residues of or contaminated by dangerous substances

Waste treatment-relevant information

Disposal in accordance with the Rules on the management of waste.

Sewage disposal-relevant information

No information.

Other disposal recommendations

No information.

Safety data sheet

SECTION 14: TRANSPORT INFORMATION

ADR/RID	IMDG	IATA	ADN
14.1 UN number or ID number			
Not dangerous according to transport regulations.	Not dangerous according to transport regulations.	Not dangerous according to transport regulations.	Not dangerous according to transport regulations.
14.2 UN proper shipping name			
Not given/not applicable	Not given/not applicable	Not given/not applicable	Not given/not applicable
14.3 Transport hazard class(es)			
Not given/not applicable	Not given/not applicable	Not given/not applicable	Not given/not applicable
14.4 Packing group			
Not given/not applicable	Not given/not applicable	Not given/not applicable	Not given/not applicable
14.5 Environmental hazards			
NO	NO	NO	NO
14.6 Special precautions for user			
Limited quantities Not given/not applicable	Limited quantities Not given/not applicable		Limited quantities Not given/not applicable
14.7 Maritime transport in bulk according to IMO instruments			
	Not given/not applicable		

SECTION 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

- Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (including last amendment Commission Regulation (EU) 2020/878)

- Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

Information according 2004/42/EC about limitation of emissions of volatile organic compounds (VOC-guideline)

not applicable

Ingredients according to Regulation (EC) No 648/2004 on detergents

No information.

Special instructions

Regulation (EC) No. 1907/2006 (REACH) Annex XVII - Terms of restriction: 56 Methylenediphenyl diisocyanate (MDI):
1. Shall not be placed on the market after 27 December 2010, as a constituent of mixtures in concentrations equal to or greater than 0,1 % by weight of MDI for supply to the general public, unless suppliers shall ensure before the placing on the market that the packaging:
(a) contains protective gloves which comply with the requirements of Council Directive 89/686/ EEC;
(b) is marked visibly, legibly and indelibly as follows, and without prejudice to other Community legislation concerning the classification, packaging and labelling of substances and mixtures:
„— Persons already sensitised to diisocyanates may develop allergic reactions when using this product.
— Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
— This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (i.e. type A1 according to standard EN 14387) is used.“
2. By way of derogation, paragraph 1(a) shall not apply to hot melt adhesives. Regulation (EC) No. 1907/2006 (REACH) Annex XVII - Terms of restriction: 74.

15.2 CHEMICAL SAFETY ASSESSMENT

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: OTHER INFORMATION

Indication of changes

5.1 Extinguishing media 7.2 Conditions for safe storage, including any incompatibilities 8.1 Control parameters 9.1 Information on basic physical and chemical properties 9.2 Other information 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 12.1 Toxicity 12.3 Bioaccumulative potential 13.1 Waste treatment methods 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Key literature references and sources for data

No information.

Abbreviations and acronyms

ATE - Acute Toxicity Estimate
ADR - Agreement concerning the International Carriage of Dangerous Goods by Road
ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CEN - European Committee for Standardisation
C&L - Classification and Labelling
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CAS# - Chemical Abstracts Service number
CMR - Carcinogen, Mutagen, or Reproductive Toxicant
CSA - Chemical Safety Assessment
CSR - Chemical Safety Report
DMEL - Derived Minimal Effect Level
DNEL - Derived No Effect Level
DPD - Dangerous Preparations Directive 1999/45/EC
DSD - Dangerous Substances Directive 67/548/EEC
DU - Downstream User
EC - European Community
ECHA - European Chemicals Agency
EC-Number - EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA - European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC - European Economic Community
EINECS - European Inventory of Existing Commercial Substances
ELINCS - European List of notified Chemical Substances
EN - European Standard
EQS - Environmental Quality Standard
EU - European Union
Euphrac - European Phrase Catalogue
EWC - European Waste Catalogue (replaced by LoW – see below)
GES - Generic Exposure Scenario
GHS - Globally Harmonized System
IATA - International Air Transport Association
ICAO-TI - Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG - International Maritime Dangerous Goods
IMSBC - International Maritime Solid Bulk Cargoes
IT - Information Technology
IUCLID - International Uniform Chemical Information Database
IUPAC - International Union for Pure Applied Chemistry
JRC - Joint Research Centre
Kow - octanol-water partition coefficient
LC50 - Lethal Concentration to 50 % of a test population
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)
LE - Legal Entity
LoW - List of Wastes (see http://ec.europa.eu/environment/waste/framework/list.htm)
LR - Lead Registrant
M/I - Manufacturer / Importer
MS - Member States
MSDS - Material Safety Data Sheet
OC - Operational Conditions
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit
OJ - Official Journal
OR - Only Representative
OSHA - European Agency for Safety and Health at work
PBT - Persistent, Bioaccumulative and Toxic substance
PEC - Predicted Effect Concentration
PNEC(s) - Predicted No Effect Concentration(s)
PPE - Personal Protection Equipment
(Q)SAR - Qualitative Structure Activity Relationship
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
RIP - REACH Implementation Project
RMM - Risk Management Measure
SCBA - Self-Contained Breathing Apparatus
SDS - Safety data sheet
SIEF - Substance Information Exchange Forum
SME - Small and Medium sized Enterprises
STOT - Specific Target Organ Toxicity
(STOT) RE - Repeated Exposure
(STOT) SE - Single Exposure
SVHC - Substances of Very High Concern
UN - United Nations
vPvB - Very Persistent and Very Bioaccumulative

List of relevant H phrases

H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.