

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006



REPLAST 2C PLASTICS ADHESIVE FAST - 50 ML (comp. A)

Version	Revision Date:	SDS Number:	Date of last issue: 26.11.2016
7.5	16.03.2017	333464-00007	Date of first issue: 11.06.2010

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

1.1 Product identifier

Trade name	:	REPLAST 2C PLASTICS ADHESIVE FAST - 50 ML (comp. A)
Product code	:	08935003

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

Use of the Sub-stance/Mixture	:	Adhesives
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1.3 Details of the supplier of the safety data sheet

Company	:	Adolf Wuerth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau
Telephone	:	+49 794015 0
Telefax	:	+49 794015 10 00
E-mail address of person responsible for the SDS	:	prodsafe@wuerth.com

1.4 Emergency telephone number

Giftnotrufzentrale Berlin +49 30 30686 790. Gesellschaft (07:00 – 18:00 Uhr) +49 794015 2552

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H332: Harmful if inhaled.
Skin irritation, Category 2	H315: Causes skin irritation.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Respiratory sensitisation, Category 1	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.
Specific target organ toxicity - single ex-	H335: May cause respiratory irritation.

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posure, Category 3

Specific target organ toxicity - repeated exposure, Category 2

H373: May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements :

- 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.

Precautionary statements :

Prevention:

- P201 Obtain special instructions before use.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

- P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.
- P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.

Hazardous components which must be listed on the label:

Diphenylmethane diisocyanate, isomers and homologues

4,4'-Diphenylmethane diisocyanate

4,4'-Methylenediphenyl diisocyanate, oligomers

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl)

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl

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isocyanate
Higher oligomers of polymeric MDI with propoxylated glycerol
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated

Additional Labelling

EUH204 Contains isocyanates. May produce an allergic reaction.

2.3 Other hazards

None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Diphenylmethane diisocyanate, isomers and homologues	9016-87-9	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	>= 10 - < 20
4,4'-Diphenylmethane diisocyanate	101-68-8 202-966-0 615-005-00-9	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	>= 10 - < 20
4,4'-Methylenediphenyl diisocyanate, oligomers	25686-28-6 500-040-3 01-2119457013-49	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	>= 10 - < 20
Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]	53862-89-8	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	>= 10 - < 20

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4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl)	9048-57-1 500-028-8	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	$\geq 5 - < 10$
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Not Assigned 247-714-0 615-005-00-9 01-2119457015-45	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	$\geq 5 - < 10$
Higher oligomers of polymeric MDI with propoxylated glycerol	57029-46-6 202-966-0 615-005-00-9	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	$\geq 1 - < 5$
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated	52409-10-6 500-115-0	Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Sens. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	$\geq 1 - < 5$

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.
- Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.
- If inhaled : If inhaled, remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Get medical attention.

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- | | | |
|-------------------------|---|--|
| In case of skin contact | : | In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Get medical attention.
Wash clothing before reuse.
Thoroughly clean shoes before reuse. |
| In case of eye contact | : | In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
If easy to do, remove contact lens, if worn.
Get medical attention. |
| If swallowed | : | If swallowed, DO NOT induce vomiting.
Get medical attention.
Rinse mouth thoroughly with water. |

4.2 Most important symptoms and effects, both acute and delayed

- | | | |
|-------|---|---|
| Risks | : | Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure. |
|-------|---|---|

4.3 Indication of any immediate medical attention and special treatment needed

- | | | |
|-----------|---|---|
| Treatment | : | Treat symptomatically and supportively. |
|-----------|---|---|

SECTION 5: Firefighting measures

5.1 Extinguishing media

- | | | |
|--------------------------------|---|--|
| Suitable extinguishing media | : | Water spray
Alcohol-resistant foam
Carbon dioxide (CO ₂)
Dry chemical |
| Unsuitable extinguishing media | : | None known. |

5.2 Special hazards arising from the substance or mixture

- | | | |
|---------------------------------------|---|--|
| Specific hazards during fire-fighting | : | Exposure to combustion products may be a hazard to health. |
| Hazardous combustion products | : | Carbon oxides
Nitrogen oxides (NO _x)
Isocyanates |

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Hydrogen cyanide (hydrocyanic acid)
Metal oxides
Silicon oxides

5.3 Advice for firefighters

- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions : Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

- Environmental precautions : Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

- Methods for cleaning up : Soak up with inert absorbent material. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use with local exhaust ventilation.
- Advice on safe handling : Do not get on skin or clothing.
Do not breathe vapours or spray mist.
Do not swallow.
Do not get in eyes.
Handle in accordance with good industrial hygiene and safety practice.
Keep container tightly closed.
Keep away from water.
Protect from moisture.
Take care to prevent spills, waste and minimize release to the environment.
- Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep in properly labelled containers. Store locked up. Keep tightly closed. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations.
- Advice on common storage : Do not store with the following product types:
Strong oxidizing agents
- Storage class (TRGS 510) : 10, Combustible liquids

7.3 Specific end use(s)

- Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Further information	For the two core content the limit values of the single isomers apply (4,4'-MDI, 2,4'-MDI, 2,2'-MDI); for the homologue content use the exposure assessment value (as indicated by the manufacturer).			
Diphenylmethane	9016-87-9	AGW (Inhalable	0,05 mg/m3	DE TRGS

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diisocyanate, isomers and homologues		fraction)	(MDI)	900
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission)., The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. Skin absorption, When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child, Substance sensitizing through the skin and respiratory system			
4,4'-Diphenylmethane diisocyanate	101-68-8	AGW (Vapour and aerosols)	0,05 mg/m3	TRGS 430
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Sum of vapour and aerosols, The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'., airway sensitizing substance			
		AGW (Vapour and aerosols, inhalable fraction)	0,05 mg/m3	DE TRGS 900
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission)., Sum of vapor and aerosols., The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. Skin absorption, When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child, Substance sensitizing through the skin and respiratory system			
Talc	14807-96-6	AGW (Inhalable fraction)	10 mg/m3	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
Further information	General dust value. For this substance no specific occupational exposure limit value is established, since the AGS does not yet have information regarding unspecific action on the respiratory organs in excess of the normal values., Commission for dangerous substances, Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission).			
		AGW (Alveolate fraction)	1,25 mg/m3	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
Further information	General dust value. For this substance no specific occupational exposure limit value is established, since the AGS does not yet have information regarding			

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	unspecific action on the respiratory organs in excess of the normal values., Commission for dangerous substances, Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission).			
Further information	Sum of vapour and aerosols, The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. The limit values of the single isomers apply			
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Not Assigned	AGW (Vapour and aerosols)	0,05 mg/m3	TRGS 430
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Sum of vapour and aerosols, The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. airway sensitizing substance, The limit values of the single isomers apply			
		AGW (Vapour and aerosols)	0,05 mg/m3	TRGS 430
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Sum of vapour and aerosols, The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. airway sensitizing substance			
		AGW (Vapour and aerosols, inhalable fraction)	0,05 mg/m3	DE TRGS 900
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission)., Sum of vapor and aerosols., The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. Skin absorption, When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child, Substance sensitizing through the skin and respiratory system			
Higher oligomers of polymeric MDI with propoxylated glycerol	57029-46-6	AGW (Vapour and aerosols)	0,05 mg/m3	TRGS 430
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Sum of vapour and aerosols, The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'. airway sensitizing substance			

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		AGW (Vapour and aerosols, inhalable fraction)	0,05 mg/m ³	DE TRGS 900
Peak-limit: excursion factor (category)	1;=2=(I)			
Further information	Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission)., Sum of vapor and aerosols., The exposure limit is established for monomers. For regulatory details on oligomers and polymers see TRGS 430 'Isocyanate'., Skin absorption, When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child, Substance sensitizing through the skin and respiratory system			
Silane, trimethoxyoctyl-, hydrolysis products with silica	92797-60-9	AGW (Inhalable fraction)	4 mg/m ³ (Silica)	DE TRGS 900
Further information	Senate commission for the review of compounds at the work place dangerous for the health (MAK-commission)., Colloidal amorphous silica, including pyrogenic silica and in wet processes manufactured silica (precipitated silica, silicagel)., When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			

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

Substance name	End Use	Exposure routes	Potential health effects	Value
4,4'-Methylenediphenyl diisocyanate, oligomers	Workers	Inhalation	Long-term systemic effects	0,05 mg/m ³
	Workers	Inhalation	Acute systemic effects	0,1 mg/m ³
	Workers	Inhalation	Long-term local effects	0,05 mg/m ³
	Workers	Inhalation	Acute local effects	0,1 mg/m ³
	Workers	Skin contact	Acute systemic effects	50 mg/kg bw/day
	Workers	Skin contact	Acute local effects	28,7 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,025 mg/m ³
	Consumers	Inhalation	Acute systemic effects	0,05 mg/m ³
	Consumers	Inhalation	Long-term local effects	0,025 mg/m ³
	Consumers	Inhalation	Acute local effects	0,05 mg/m ³
	Consumers	Skin contact	Acute systemic effects	25 mg/kg bw/day
	Consumers	Skin contact	Acute local effects	17,2 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	20 mg/kg

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			fects	bw/day
4,4'-Diphenylmethane diisocyanate	Workers	Inhalation	Long-term local effects	0,05 mg/m3
	Workers	Inhalation	Acute local effects	0,1 mg/m3
	Consumers	Inhalation	Long-term local effects	0,025 mg/m3
	Consumers	Inhalation	Acute local effects	0,05 mg/m3
Zeolites	Workers	Inhalation	Long-term systemic effects	3 mg/m3
	Workers	Skin contact	Long-term systemic effects	2,5 mg/kg bw/day
	Consumers	Inhalation	Long-term local effects	0,003 mg/m3
	Consumers	Skin contact	Long-term systemic effects	1,25 mg/kg bw/day
	Consumers	Ingestion		1,25 mg/kg bw/day
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Workers	Inhalation	Long-term systemic effects	0,05 mg/m3
	Workers	Inhalation	Acute systemic effects	0,1 mg/m3
	Workers	Inhalation	Long-term local effects	0,05 mg/m3
	Workers	Inhalation	Acute local effects	0,1 mg/m3
	Workers	Skin contact	Acute systemic effects	50 mg/kg bw/day
	Workers	Skin contact	Acute local effects	28,7 mg/cm2
	Consumers	Inhalation	Long-term systemic effects	0,025 mg/m3
	Consumers	Inhalation	Acute systemic effects	0,05 mg/m3
	Consumers	Inhalation	Long-term local effects	0,025 mg/m3
	Consumers	Inhalation	Acute local effects	0,05 mg/m3
	Consumers	Skin contact	Acute systemic effects	25 mg/kg
	Consumers	Skin contact	Acute local effects	17,2 mg/kg
	Consumers	Ingestion	Acute systemic effects	20 mg/kg

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

Substance name	Environmental Compartment	Value
4,4'-Methylenediphenyl diisocyanate, oligomers	Fresh water	1 mg/l
	Marine water	0,1 mg/l
	Intermittent use/release	10 mg/l
	Sewage treatment plant	1 mg/l
	Soil	1 mg/kg

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4,4'-Diphenylmethane diisocyanate	Fresh water	1 mg/l
	Marine water	0,1 mg/l
	Intermittent use/release	10 mg/l
	Sewage treatment plant	1 mg/l
	Soil	1 mg/kg
Zeolites	Fresh water	3,2 mg/l
	Marine water	0,32 mg/l
	Sewage treatment plant	95 mg/l
	Soil	600 mg/kg
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Fresh water	1 mg/l
	Marine water	0,1 mg/l
	Intermittent use/release	10 mg/l
	Sewage treatment plant	1 mg/l
	Soil	1 mg/kg

8.2 Exposure controls

Engineering measures

Processing may form hazardous compounds (see section 10).
Minimize workplace exposure concentrations.
Use with local exhaust ventilation.

Personal protective equipment

Eye protection : Wear the following personal protective equipment:
Safety goggles

Hand protection
Material : Nitrile rubber
Break through time : 240 min
Glove thickness : 0,5 mm

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

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Filter type : Combined particulates and organic vapour type (A-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	: viscous
Colour	: beige
Odour	: No data available
Odour Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: > 200 °C
Flash point	: 203 °C Other information: No data available
Evaporation rate	: No data available
Flammability (solid, gas)	: Not applicable
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: < 0,0133 hPa (25 °C)
Relative vapour density	: > 1 (Air = 1.0)
Density	: 1,288 g/cm ³ (20 °C)
Solubility(ies) Water solubility	: practically insoluble, Decomposes in contact with water.
Partition coefficient: n-octanol/water	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available

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Viscosity
Viscosity, dynamic : ca. 20.000 mPa.s

Viscosity, kinematic : No data available

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

9.2 Other information

Particle size : Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

Not classified as a reactivity hazard.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Can react with strong oxidizing agents.
Hazardous decomposition products will be formed upon contact with water or humid air.

10.4 Conditions to avoid

Conditions to avoid : Exposure to moisture

10.5 Incompatible materials

Materials to avoid : Oxidizing agents
Water

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of exposure : Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity

Harmful if inhaled.

Product:

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Acute inhalation toxicity : Acute toxicity estimate: 1,99 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2,24 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

4,4'-Diphenylmethane diisocyanate:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 2,24 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomers:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg
Method: OECD Test Guideline 425
Remarks: Based on data from similar materials

Acute inhalation toxicity : Acute toxicity estimate: 1,5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgement
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 9.400 mg/kg
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg

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Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): 0,49 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2,24 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): 0,49 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 9.400 mg/kg
Remarks: Based on data from similar materials

Higher oligomers of polymeric MDI with propoxylated glycerol:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on data from similar materials

Acute inhalation toxicity : Acute toxicity estimate: 1,5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgement
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Remarks: Based on data from similar materials

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4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg
Remarks: Based on data from similar materials

Acute inhalation toxicity : Acute toxicity estimate: 1,5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgement
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Remarks: Based on data from similar materials

Skin corrosion/irritation

Causes skin irritation.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Species: Rabbit
Result: Skin irritation

4,4'-Diphenylmethane diisocyanate:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomers:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Species: Rabbit
Result: Skin irritation
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Species: Rabbit
Result: Skin irritation
Remarks: Based on data from similar materials

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Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation

Higher oligomers of polymeric MDI with propoxylated glycerol:

Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Species: Rabbit
Result: Skin irritation
Remarks: Based on data from similar materials

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Result: Irritation to eyes, reversing within 7 days

4,4'-Diphenylmethane diisocyanate:

Result: Irritation to eyes, reversing within 7 days
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

4,4'-Methylenediphenyl diisocyanate, oligomers:

Result: Irritation to eyes, reversing within 7 days
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Remarks: Based on data from similar materials
Based on harmonised classification in EU regulation 1272/2008, Annex VI

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Method: OECD Test Guideline 405
Result: Irritation to eyes, reversing within 7 days
Remarks: Based on data from similar materials

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Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Result: Irritation to eyes, reversing within 7 days

Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

Higher oligomers of polymeric MDI with propoxylated glycerol:

Result: Irritation to eyes, reversing within 7 days

Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Species: Rabbit

Result: Irritation to eyes, reversing within 7 days

Remarks: Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

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

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Test Type: Buehler Test

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: inhalation (dust/mist/fume)

Species: Rat

Result: positive

Assessment: Probability of respiratory sensitisation in humans based on animal testing

4,4'-Diphenylmethane diisocyanate:

Test Type: Buehler Test

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

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Result: positive

Remarks: Based on data from similar materials

Assessment: Probability of respiratory sensitisation in humans based on animal testing

4,4'-Methylenediphenyl diisocyanate, oligomers:

Test Type: Maximisation Test

Exposure routes: Skin contact

Species: Guinea pig

Method: OECD Test Guideline 406

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability of respiratory sensitisation in humans based on animal testing

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Test Type: Maximisation Test

Exposure routes: Skin contact

Species: Guinea pig

Method: OECD Test Guideline 406

Result: positive

Remarks: Based on data from similar materials

Based on harmonised classification in EU regulation 1272/2008, Annex VI

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

Result: positive

Remarks: Based on data from similar materials

Based on harmonised classification in EU regulation 1272/2008, Annex VI

Assessment: Probability of respiratory sensitisation in humans based on animal testing

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Assessment: Probability or evidence of skin sensitisation in humans

Test Type: Buehler Test

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

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Remarks: Based on data from similar materials

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability of respiratory sensitisation in humans based on animal testing

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Test Type: Buehler Test

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability of respiratory sensitisation in humans based on animal testing

Higher oligomers of polymeric MDI with propoxylated glycerol:

Test Type: Buehler Test

Exposure routes: Skin contact

Species: Guinea pig

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

Result: positive

Remarks: Based on data from similar materials

Assessment: Probability of respiratory sensitisation in humans based on animal testing

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Test Type: Maximisation Test

Exposure routes: Skin contact

Species: Guinea pig

Method: OECD Test Guideline 406

Result: positive

Remarks: Based on data from similar materials

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Assessment: Probability or evidence of skin sensitisation in humans

Exposure routes: Inhalation

Species: Rat

Result: positive

Assessment: Probability of respiratory sensitisation in humans based on animal testing

Germ cell mutagenicity

Not classified based on available information.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo
cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative

4,4'-Diphenylmethane diisocyanate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo
cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative

4,4'-Methylenediphenyl diisocyanate, oligomers:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo
cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

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Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: inhalation (dust/mist/fume) Result: negative Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: Inhalation Method: OECD Test Guideline 474 Result: negative Remarks: Based on data from similar materials

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Method: OECD Test Guideline 474 Result: negative Remarks: Based on data from similar materials

Higher oligomers of polymeric MDI with propoxylated glycerol:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: inhalation (dust/mist/fume)

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Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

Carcinogenicity

Suspected of causing cancer.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

4,4'-Diphenylmethane diisocyanate:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

4,4'-Methylenediphenyl diisocyanate, oligomers:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

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Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 yr
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

Higher oligomers of polymeric MDI with propoxylated glycerol:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 Years

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Result: positive

Remarks: Based on data from similar materials

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

Reproductive toxicity

Not classified based on available information.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative

4,4'-Diphenylmethane diisocyanate:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomers:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

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Higher oligomers of polymeric MDI with propoxylated glycerol:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

STOT - single exposure

May cause respiratory irritation.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Assessment: May cause respiratory irritation.

4,4'-Diphenylmethane diisocyanate:

Assessment: May cause respiratory irritation.

4,4'-Methylenediphenyl diisocyanate, oligomers:

Assessment: May cause respiratory irritation.
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Assessment: May cause respiratory irritation.
Remarks: Based on data from similar materials
Based on harmonised classification in EU regulation 1272/2008, Annex VI

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Assessment: May cause respiratory irritation.

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Assessment: May cause respiratory irritation.

Higher oligomers of polymeric MDI with propoxylated glycerol:

Assessment: May cause respiratory irritation.
Remarks: Based on data from similar materials

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4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Assessment: May cause respiratory irritation.

Remarks: Based on data from similar materials

STOT - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

4,4'-Diphenylmethane diisocyanate:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

4,4'-Methylenediphenyl diisocyanate, oligomers:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Remarks: Based on data from similar materials

Based on harmonised classification in EU regulation 1272/2008, Annex VI

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Exposure routes: inhalation (dust/mist/fume)

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Target Organs: Respiratory system

Assessment: May cause damage to organs through prolonged or repeated exposure.

Higher oligomers of polymeric MDI with propoxylated glycerol:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Exposure routes: inhalation (dust/mist/fume)

Target Organs: Respiratory system

Assessment: Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Repeated dose toxicity

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Species: Rat

NOAEL: 1.4 mg/m³

LOAEL: 4.1 mg/m³

Application Route: inhalation (dust/mist/fume)

Exposure time: 13 Weeks

4,4'-Diphenylmethane diisocyanate:

Species: Rat

NOAEL: 0,2 mg/m³

LOAEL: 1 mg/m³

Application Route: inhalation (dust/mist/fume)

Exposure time: 2 yr

Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomers:

Species: Rat

NOAEL: 0,2 mg/m³

LOAEL: 1 mg/m³

Application Route: inhalation (dust/mist/fume)

Exposure time: 2 yr

Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Species: Rat

NOAEL: 0,2 mg/m³

LOAEL: 1 mg/m³

Application Route: inhalation (dust/mist/fume)

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REPLAST 2C PLASTICS ADHESIVE FAST - 50 ML (comp. A)

Version	Revision Date:	SDS Number:	Date of last issue: 26.11.2016
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Exposure time: 2 yr
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Species: Rat
LOAEL: 0,00098 mg/l
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 yr
Remarks: Based on data from similar materials

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Species: Rat
NOAEL: 0,0002 mg/l
LOAEL: 0,001 mg/l
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 yr
Remarks: Based on data from similar materials

Higher oligomers of polymeric MDI with propoxylated glycerol:

Species: Rat
NOAEL: 0,2 mg/m³
LOAEL: 1 mg/m³
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 yr
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Species: Rat
NOAEL: 0,2 mg/m³
LOAEL: 1 mg/m³
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 yr
Remarks: Based on data from similar materials

Aspiration toxicity

Not classified based on available information.

Experience with human exposure

Components:

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Inhalation	: Symptoms: Sensitisation, respiratory tract irritation
Skin contact	: Symptoms: Skin irritation

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Eye contact : Symptoms: Eye irritation

SECTION 12: Ecological information

12.1 Toxicity

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Toxicity to fish	: LC50 (Danio rerio (zebra fish)): > 1.000 mg/l Exposure time: 96 h
Toxicity to algae	: ErC50 (Desmodesmus subspicatus (green algae)): > 1.640 mg/l Exposure time: 72 h
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: > 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea)

4,4'-Diphenylmethane diisocyanate:

Toxicity to fish	: LC50 (Oryzias latipes (Orange-red killifish)): > 3.000 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 129,7 mg/l Exposure time: 24 h Method: OECD Test Guideline 202
Toxicity to algae	: EC50 (Desmodesmus subspicatus (green algae)): > 1.640 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials NOEC (Desmodesmus subspicatus (green algae)): 1.640 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to microorganisms	: EC50 : > 100 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211 Remarks: Based on data from similar materials

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4,4'-Methylenediphenyl diisocyanate, oligomers:

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1.000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.000 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials
- Toxicity to algae : ErC50 (Desmodesmus subspicatus (green algae)): > 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials
- NOEC (Desmodesmus subspicatus (green algae)): 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials
- Toxicity to microorganisms : EC50 : > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 10 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro.-omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

- Toxicity to fish : LC50 : > 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials
- Toxicity to algae : ErC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials
- NOEC (Desmodesmus subspicatus (green algae)): >= 100 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

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Toxicity to microorganisms : EC50 : > 100 mg/l
Exposure time: 3 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 10 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 3.000 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): > 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOELR (Desmodesmus subspicatus (green algae)): 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: \geq 10 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Toxicity to fish : LL50 (Danio rerio (zebra fish)): > 1.000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae : EL50 (Scenedesmus subspicatus): > 1.640 mg/l

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Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOELR (Scenedesmus subspicatus): 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 : > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR: >= 10 mg/l
Exposure time: 21 d
Species: Daphnia (water flea)
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Higher oligomers of polymeric MDI with propoxylated glycerol:

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 3.000 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 129,7 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): > 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Desmodesmus subspicatus (green algae)): 1.640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50 : > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 10 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

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4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Remarks: Based on data from similar materials
Toxicity to algae	:	ErC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Remarks: Based on data from similar materials NOEC (Desmodesmus subspicatus (green algae)): >= 100 mg/l Exposure time: 72 h Remarks: Based on data from similar materials
Toxicity to microorganisms	:	EC50 : > 100 mg/l Exposure time: 3 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: > 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Remarks: Based on data from similar materials

12.2 Persistence and degradability

Components:

Diphenylmethane diisocyanate, isomers and homologues:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d
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4,4'-Diphenylmethane diisocyanate:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302 Remarks: Based on data from similar materials
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4,4'-Methylenediphenyl diisocyanate, oligomers:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302 Remarks: Based on data from similar materials
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Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly(oxy(methyl-1,2-ethanediyl))]:

Biodegradability : Result: Not readily biodegradable.
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 302
Remarks: Based on data from similar materials

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated:

Biodegradability : Result: Not readily biodegradable.
Remarks: Based on data from similar materials

12.3 Bioaccumulative potential

Components:

4,4'-Diphenylmethane diisocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200

Partition coefficient: n-octanol/water : log Pow: 4,51

4,4'-Methylenediphenyl diisocyanate, oligomers:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Remarks: Based on data from similar materials

4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with α -hydro- ω -hydroxypoly(oxy-1,2-ethanediyl):

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Method: OECD Test Guideline 305C
Remarks: Based on data from similar materials

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Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Remarks: Based on data from similar materials

Partition coefficient: n-octanol/water : log Pow: 4,51

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Not relevant

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

Waste Code : The following Waste Codes are only suggestions:

used product
080409, waste adhesives and sealants containing organic solvents or other dangerous substances

unused product
080409, waste adhesives and sealants containing organic solvents or other dangerous substances

uncleaned packagings
150110, packaging containing residues of or contaminated by dangerous substances

SECTION 14: Transport information

14.1 UN number

ADN : Not regulated as a dangerous good

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ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	UN 3334

14.2 UN proper shipping name

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Aviation regulated liquid, n.o.s. (4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated, 4,4'-Diphenylmethane diisocyanate)

14.3 Transport hazard class(es)

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	9

14.4 Packing group

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA (Cargo)		
Packing instruction (cargo aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

IATA (Passenger)		
Packing instruction (passenger aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

14.5 Environmental hazards

ADN	:	Not regulated as a dangerous good
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ADR : Not regulated as a dangerous good
RID : Not regulated as a dangerous good
IMDG : Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

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

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Diphenylmethane diisocyanate, isomers and homologues (56)
4,4'-Diphenylmethane diisocyanate (56)
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate (56)
4,4'-Methylenediphenyl diisocyanate, oligomeric reaction products with glycerol, propoxylated (56)

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
Not applicable

Water contaminating class (Germany) : WGK 1 slightly water endangering
Classification according VwVwS, Annex 4.

Volatile organic compounds : Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
Volatile organic compounds (VOC) content: 0 %, 0 g/l
Remarks: VOC content excluding water

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Other regulations:

TRGS 430 (German regulatory requirements)

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Full text of H-Statements

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 if inhaled.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Carc.	: Carcinogenicity
Eye Irrit.	: Eye irritation
Resp. Sens.	: Respiratory sensitisation
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation
STOT RE	: Specific target organ toxicity - repeated exposure
STOT SE	: Specific target organ toxicity - single exposure
DE TRGS 900	: Germany. TRGS 900 - Occupational exposure limit values.
TRGS 430	: Germany. TRGS 430 - Isocyanates
DE TRGS 900 / AGW	: Time Weighted Average
TRGS 430 / AGW	: Occupational Exposure Limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; 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 - In-

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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; TCSI - Taiwan Chemical Substance 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

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Classification of the mixture:

Acute Tox. 4	H332
Skin Irrit. 2	H315
Eye Irrit. 2	H319
Resp. Sens. 1	H334
Skin Sens. 1	H317
Carc. 2	H351
STOT SE 3	H335
STOT RE 2	H373

Classification procedure:

Calculation method
Calculation method
Calculation method
Calculation method
Calculation method
Calculation method
Calculation method
Calculation method

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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 is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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DE / EN