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

1.1 Product identifier

Trade name : HEKAPUR Fast Cast Resin M4 Component B

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

Use of the Substance/Mixture : Polyurethane Hardener

1.3 Details of the supplier of the safety data sheet

Exact Plastics GmbH
Genossenschaftsstr. 12
D-29356 Bröckel

Phone: +49 (0) 5144 4955648
Fax: +49 (0) 5144 4955649
E-Mail: info@exact-plastics-gmbh.de

1.4 Emergency telephone number

+49 (0) 5144 4955648

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 exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Chronic aquatic toxicity, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms	:		
Signal word	:	Danger	
Hazard statements	:	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.
		H411	Toxic to aquatic life with long lasting effects.
Precautionary statements	:	**Prevention:**	
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		P284	Wear respiratory protection.
		Response:	
		P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
		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.
		P331	Do NOT induce vomiting.

Hazardous components which must be listed on the label:

Polymeric MDI

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

bis(isopropyl)naphthalene

4,4'-methylenediphenyl diisocyanate

DIPHENYLMETHANE DIISOCYANATE

Additional Labelling:

EUH204 .Contains isocyanates. May produce an allergic reaction.

2.3 Other hazards

This substance/mixture contains components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB).

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Diphenylmethane diisocyanate based mixture

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration (%)
Polymeric MDI	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 SE3; H335 STOT RE2; H373	>= 25 - < 30
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Not Assigned 01-2119457015-45	Acute Tox.4; H332 Skin Irrit.2; H315 Eye Irrit.2; H319 Resp. Sens.1; H334 Skin Sens.1; H317 STOT SE3; H335 STOT RE2; H373 Carc.2; H351	>= 25 - < 30
bis(isopropyl)naphthalene	38640-62-9 254-052-6	Asp. Tox.1; H304 Aquatic Chronic1; H410	>= 20 - < 25
Terphenyl, hydrogenated	61788-32-7 262-967-7	Aquatic Chronic2; H411	>= 12,5 - < 20
4,4'-methylenediphenyl diisocyanate	101-68-8 202-966-0 01-2119457014-47	Acute Tox.4; H332 Skin Irrit.2; H315 Eye Irrit.2; H319 Resp. Sens.1; H334 Skin Sens.1; H317 Carc.2; H351 STOT SE3; H335 STOT RE2; H373	>= 7 - < 10
DIPHENYLMETHANE DIISOCYANATE	25686-28-6	Acute Tox.4; H332 Skin Irrit.2; H315 Eye Irrit.2; H319 Resp. Sens.1;	>= 3 - < 5

		H334 Skin Sens.1; H317 Carc.2; H351 STOT SE3; H335 STOT RE2; H373	

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Keep warm and in a quiet place.
Show this safety data sheet to the doctor in attendance.
Take off all contaminated clothing immediately.

If inhaled : Move to fresh air.
Keep patient warm and at rest.
If breathing is irregular or stopped, administer artificial respiration.
If breathing is labored, administer oxygen.
If symptoms persist, call a physician.

In case of skin contact : Wash off immediately with soap and plenty of water.
Do NOT use solvents or thinners.
If on clothes, remove clothes.
If skin irritation persists, call a physician.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes.
If eye irritation persists, consult a specialist.
If easy to do, remove contact lens, if worn.

If swallowed : Keep at rest.
Do not induce vomiting without medical advice.
Keep respiratory tract clear.
If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Breathing difficulties
Lachrymation
Redness
Irritation

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Carbon dioxide (CO2)
Foam
Sand

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Decomposes in a fire giving off toxic fumes: oxides of nitrogen
The pressure in sealed containers can increase under the influence of heat.
Cool closed containers exposed to fire with water spray.

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.

Further information : In the event of fire and/or explosion do not breathe fumes.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Immediately evacuate personnel to safe areas.
Prevent fire extinguishing water from contaminating surface water or the ground water system.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Refer to protective measures listed in sections 7 and 8.
Evacuate personnel to safe areas.
Use personal protective equipment.
Ensure adequate ventilation.
Only qualified personnel equipped with suitable protective equipment may intervene.
Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains.

6.2 Environmental precautions

Environmental precautions : Do not allow uncontrolled discharge of product into the environment.
Try to prevent the material from entering drains or water courses.
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 (e.g. sand, silica gel, acid binder, universal binder, sawdust). Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Pick up and transfer to properly labelled containers.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Provide sufficient air exchange and/or exhaust in work rooms. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Avoid inhalation, ingestion and contact with skin and eyes. Use only in area provided with appropriate exhaust ventilation. Smoking, eating and drinking should be prohibited in the application area.
Advice on protection against fire and explosion	:	Keep away from open flames, hot surfaces and sources of ignition.
Hygiene measures	:	Provide adequate ventilation. Wash hands and face before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep containers tightly closed in a dry, cool and well-ventilated place. To maintain product quality, do not store in heat or direct sunlight. Keep in properly labelled containers.
Advice on common storage	:	Keep away from oxidizing agents, strongly acid or alkaline materials, as well as of amines, alcohols and water. Keep away from food and drink. Keep product and empty container away from heat and sources of ignition.
Dampness	:	Keep containers dry and tightly closed to avoid moisture absorption and contamination.
Other data	:	Stable at normal ambient temperature and pressure.

7.3 Specific end use(s)

Specific use(s)	:	Consult the technical guidelines for the use of this substance/mixture.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Polymeric MDI	9016-87-9	TWA	0,02 mg/m3 (NCO)	GB EH40
Further information	Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-responsive. 54 Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not include the disease themselves. The latter substances are not classified asthmagens or respiratory sensitisers., Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance., Capable of causing occupational asthma. The identified substances are those which: - are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or - are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma., The 'Sen' notation in the list of WELs has been assigned only to those substances which may cause occupational asthma.				
		STEL	0,07 mg/m3 (NCO)	GB EH40
Further information	Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-responsive. 54 Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not			

	include the disease themselves. The latter substances are not classified asthmagens or respiratory sensitisers., Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance., Capable of causing occupational asthma. The identified substances are those which: - are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or - are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma., The 'Sen' notation in the list of WELs has been assigned only to those substances which may cause occupational asthma.			
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	0,02 mg/m3 (NCO)	GB EH40
Further information	Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-responsive. 54 Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not include the disease themselves. The latter substances are not classified asthmagens or respiratory sensitisers., Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance., Capable of causing occupational asthma. The identified substances are those which: - are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or - are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma., The 'Sen' notation in the list of WELs has been assigned only to those substances			

	which may cause occupational asthma.			
		STEL	0,07 mg/m3 (NCO)	GB EH40
Further information	Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-responsive. 54 Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not include the disease themselves. The latter substances are not classified asthmagens or respiratory sensitisers., Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance., Capable of causing occupational asthma. The identified substances are those which: - are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or - are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma., The 'Sen' notation in the list of WELs has been assigned only to those substances which may cause occupational asthma.			

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
Polymeric MDI	9016-87-9	urinary diamine: 1 µmol/mol creatinine (Urine)	Post task	GB EH40 BAT
4,4'-methylenediphenyl diisocyanate	101-68-8	urinary diamine: 1 µmol/mol creatinine (Urine)	Post task	GB EH40 BAT

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

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate : End Use: Workers
Exposure routes: Skin contact
Potential health effects: Acute systemic effects
Value: 50 mg/kg

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Acute systemic effects
Value: 0,1 mg/m3
End Use: Workers

		Exposure routes: Skin contact Potential health effects: Acute local effects Value: 28,7 mg/cm2 End Use: Workers Exposure routes: Inhalation Potential health effects: Acute local effects Value: 0,1 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 0,05 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Skin contact Potential health effects: Acute systemic effects Value: 25 mg/kg End Use: Consumers Exposure routes: Inhalation Potential health effects: Acute systemic effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Ingestion Potential health effects: Acute systemic effects Value: 20 mg/kg End Use: Consumers Exposure routes: Skin contact Potential health effects: Acute local effects Value: 17,2 mg/cm2 End Use: Consumers Exposure routes: Inhalation Potential health effects: Acute local effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 0,025 mg/m3 End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 0,025 mg/m3
bis(isopropyl)naphthalene	:	End Use: Consumers Exposure routes: Ingestion Potential health effects: Long-term systemic effects Value: 2,1 mg/kg End Use: Consumers Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: 2,1 mg/kg End Use: Workers Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: 4,3 mg/kg End Use: Consumers

		Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 7,4 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 30 mg/m3
Terphenyl, hydrogenated	:	End Use: Workers Exposure routes: Skin contact Potential health effects: Long-term local effects Value: 0,2 mg/cm2 End Use: Workers Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: 46,3 mg/kg End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 83,8 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 8,38 mg/m3 End Use: Consumers Exposure routes: Ingestion Potential health effects: Long-term systemic effects Value: 0,3 mg/kg End Use: Consumers Exposure routes: Skin contact Potential health effects: Long-term local effects Value: 0,12 mg/cm2 End Use: Consumers Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: 27,8 mg/kg End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 25 mg/m3 End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 2,5 mg/m3
4,4'-methylenediphenyl diisocyanate	:	End Use: Workers Exposure routes: Skin contact Potential health effects: Acute systemic effects Value: 50 mg/kg End Use: Workers Exposure routes: Skin contact Potential health effects: Acute local effects Value: 28,7 mg/cm2 End Use: Workers Exposure routes: Inhalation Potential health effects: Acute systemic effects Value: 0,1 mg/m3 End Use: Workers

		Exposure routes: Inhalation Potential health effects: Acute local effects Value: 0,1 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 0,05 mg/m3 End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Skin contact Potential health effects: Acute systemic effects Value: 25 mg/kg End Use: Consumers Exposure routes: Inhalation Potential health effects: Acute systemic effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Ingestion Potential health effects: Acute systemic effects Value: 20 mg/kg End Use: Consumers Exposure routes: Skin contact Potential health effects: Acute local effects Value: 17,2 mg/cm2 End Use: Consumers Exposure routes: Inhalation Potential health effects: Acute local effects Value: 0,05 mg/m3 End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 0,025 mg/m3 End Use: Consumers Exposure routes: Inhalation Potential health effects: Long-term local effects Value: 0,025 mg/m3
DIPHENYLMETHANE DIISOCYANATE	:	End Use: Workers Exposure routes: Skin contact Potential health effects: Acute systemic effects Value: 50 mg/kg End Use: Workers Exposure routes: Inhalation Potential health effects: Acute systemic effects Value: 0,1 mg/m3 End Use: Workers Exposure routes: Skin contact Potential health effects: Acute local effects Value: 28,7 mg/cm2 End Use: Workers Exposure routes: Inhalation Potential health effects: Acute local effects Value: 0,1 mg/m3 End Use: Workers

Exposure routes: Inhalation
Potential health effects: Acute systemic effects
Value: 0,05 mg/m3
End Use: Workers
Exposure routes: Inhalation
Potential health effects: Acute local effects
Value: 0,05 mg/m3

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

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	:	Fresh water Value: 1 mg/l Marine water Value: 0,1 mg/l Soil Value: 1 mg/kg Sewage treatment plant Value: 1 mg/l
bis(isopropyl)naphthalene	:	Sewage treatment plant Value: 0,15 mg/l Fresh water Value: 0,00026 mg/l Marine water Value: 0,000026 mg/l Fresh water sediment Value: 0,94 mg/kg Marine sediment Value: 0,094 mg/kg Soil Value: 0,19 mg/kg
Terphenyl, hydrogenated	:	Fresh water Value: 0,0001 mg/l Marine water Value: 0,00001 mg/l Fresh water sediment Value: 3,16 mg/kg Marine sediment Value: 0,316 mg/kg Soil Value: 0,631 mg/kg Sewage treatment plant Value: 10,3 mg/l Intermittent releases Value: 0,001 mg/l
4,4'-methylenediphenyl diisocyanate	:	Fresh water Value: > 1 mg/l Marine water Value: > 0,1 mg/l Soil Value: 1 mg/kg Sewage treatment plant Value: > 1 mg/l
DIPHENYLMETHANE DIISOCYANATE	:	Fresh water Value: > 1 mg/l

Marine water
Value: > 0,1 mg/l
Soil
Value: > 1 mg/kg
Sewage treatment plant
Value: > 1 mg/l

8.2 Exposure controls

Engineering measures

Recommended minimum velocity for exhaust ventilation
effective ventilation in all processing areas
Effective exhaust ventilation system
Ensure that extracted air cannot be returned to the workplace through the ventilation system.

Personal protective equipment

Eye protection	:	Do not wear contact lenses. Safety glasses with side-shields conforming to EN166 Ensure that eyewash stations and safety showers are close to the workstation location.
Hand protection Material	:	Protective gloves complying with EN 374.
Skin and body protection	:	Protective suit
Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Use respirator when performing operations involving potential exposure to vapour of the product. Respirator with a vapour filter (EN 141) The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.
Protective measures	:	Avoid contact with skin. Wear suitable protective equipment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid
Colour	:	red brown
Odour	:	musty
Odour Threshold	:	not determined
pH	:	not determined

Melting point/freezing point	:	Not applicable
Boiling point/boiling range	:	> 200 °C Flash
point	:	100 °C
Evaporation rate	:	not determined
Upper explosion limit	:	Not applicable
Lower explosion limit	:	Not applicable
Vapour pressure	:	Not applicable
Relative vapour density	:	not determined
Density	:	1,1 g/cm3 (25 °C)
Bulk density	:	not determined
Solubility(ies)		
Solubility in other solvents	:	not determined
Partition coefficient: n-octanol/water	:	No data available
Ignition temperature	:	Not applicable
Auto-ignition temperature	:	Not applicable
Thermal decomposition	:	Method: No data available
Viscosity		
Viscosity, dynamic	:	20 - 40 mPa.s (25 °C)
Viscosity, kinematic	:	not determined
Explosive properties	:	Not applicable
Oxidizing properties	:	Not applicable

9.2 Other information

Surface tension	:	not determined
Sublimation point	:	Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.
Container can be pressurized by carbon dioxide due to reaction with humid air and/or water.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : Reacts violently with water.
Evolution of CO2 in closed containers causes overpressure and produces a risk of bursting.

10.4 Conditions to avoid

Conditions to avoid : Direct sources of heat.

10.5 Incompatible materials

Materials to avoid : Humid air
Acids and bases
Amines

10.6 Hazardous decomposition products

Hazardous decomposition products : Container can be pressurized by carbon dioxide due to reaction with humid air and/or water.
Stable under normal conditions.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : Acute toxicity estimate : 2,38 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Polymeric MDI:

Acute oral toxicity : LD50 (Rat, male and female): > 10,000 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat, male and female): 0,31 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Method: OECD Test Guideline 403
Assessment: Harmful by inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9.400 mg/kg
Method: OECD Test Guideline 402

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

Acute oral toxicity : LD50 (Rat, male and female): > 10.000 mg/kg
Method: Tested according to Annex V of Directive 67/548/EEC.
GLP: yes

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9.400 mg/kg
Method: OECD Test Guideline 402

bis(isopropyl)naphthalene:

Acute inhalation toxicity : LC50 (Rat, male and female): > 5,64 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

Acute dermal toxicity : LD50 (Rat, male and female): > 4.000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

Terphenyl, hydrogenated:

Acute oral toxicity : LD50 (Rat, male and female): > 10.000 mg/kg
Method: OECD Test Guideline 401
GLP: yes

Acute inhalation toxicity : LC50 (Rat, male and female): > 4,7 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2.000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

4,4'-methylenediphenyl diisocyanate:

Acute oral toxicity : LD50 (Rat, male and female): > 2.000 mg/kg
Method: Tested according to Annex V of Directive 67/548/EEC.
GLP: yes

Acute inhalation toxicity : LC50 (Rat, male): 1,5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes

DIPHENYLMETHANE DIISOCYANATE:

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

Method: OECD Test Guideline 425
GLP: yes

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9.400 mg/kg
Method: OECD Test Guideline 402

Skin corrosion/irritation

Product:

Remarks: No data available

Components:

Polymeric MDI:
Species: Rabbit
Method: OECD Test Guideline 404
Result: slight irritation

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
GLP: yes

bis(isopropyl)naphthalene:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation
GLP: yes

Terphenyl, hydrogenated:
Species: Rabbit
Result: No skin irritation
GLP: yes

4,4'-methylenediphenyl diisocyanate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation
GLP: yes

DIPHENYLMETHANE DIISOCYANATE:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
GLP: yes

Serious eye damage/eye irritation

Product:

Remarks: No data available

Components:

Polymeric MDI:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation
GLP: yes

bis(isopropyl)naphthalene:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation
GLP: yes

4,4'-methylenediphenyl diisocyanate:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation

DIPHENYLMETHANE DIISOCYANATE:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation
GLP: yes

Respiratory or skin sensitisation

Product:

Remarks: No data available

Components:

Polymeric MDI:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Assessment: Does not cause skin sensitisation.
Method: OECD Test Guideline 406
Result: negative

Test Type: Mouse Local Lymph Node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Assessment: May cause sensitisation by skin contact.
Method: OECD Test Guideline 429
Result: positive

Exposure routes: intratracheal
Species: Rat
Assessment: May cause sensitisation by inhalation.

Result: positive

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate:
Species: Rat
Result: Causes sensitisation.
GLP: yes

bis(isopropyl)naphthalene:
Test Type: Maximisation Test
Exposure routes: Dermal
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.
GLP: yes

4,4'-methylenediphenyl diisocyanate:
Test Type: Buehler Test
Exposure routes: Dermal
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.
GLP: yes

DIPHENYLMETHANE DIISOCYANATE:
Test Type: Maximisation Test
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.
GLP: yes

Species: Rat
Result: May cause sensitisation by inhalation.
GLP: yes

Germ cell mutagenicity

Components:

Polymeric MDI:

Genotoxicity in vitro	:	Test Type: Ames test Test species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test Test species: Rat (male) Application Route: Inhalation Exposure time: 3x1h/day over 3 weeks) Method: OECD Test Guideline 474 Result: negative
Germ cell mutagenicity-Assessment	:	In vitro tests did not show mutagenic effects, In vivo tests did not show mutagenic effects

4,4'-methylenediphenyl diisocyanate:

Genotoxicity in vitro	:	Test Type: Ames test Test species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test Test species: Rat (male) Application Route: Inhalation Exposure time: 3x1 h/ day over 3 weeks Method: OECD Test Guideline 474 Result: negative
Germ cell mutagenicity-Assessment	:	In vitro tests did not show mutagenic effects, In vivo tests did not show mutagenic effects

Carcinogenicity

Components:

Polymeric MDI:

Species: Rat, (male and female)
Application Route: Inhalation
Exposure time: 2 h
Dose: 0 - 0,2 - 1 - 6 mg/m3
Frequency of Treatment: 6 hours/day, 5 days/week
Method: OECD Test Guideline 453
Test substance: see user defined free text

Carcinogenicity - Assessment	:	Suspected of causing cancer if inhaled.

4,4'-methylenediphenyl diisocyanate:

Species: Rat, (male and female)
Exposure time: 2 hrs
Dose: 0 - 0,2 - 1 - 6 mg/m3
Frequency of Treatment: 6 hours/ day, 5 days/ week
Method: OECD Test Guideline 453

Carcinogenicity - Assessment	:	Suspected of causing cancer if inhaled.

Reproductive toxicity

Components:

Polymeric MDI:

Effects on foetal development	:	Species: Rat, female Application Route: Inhalation Exposure time: 20 days Dose: 0 - 1 - 4 - 12 mg/m3 12 mg/m3 4 mg/m3 Number of exposures: 6 hours/day (Exposure duration Method: OECD Test Guideline 414

Reproductive toxicity - Assessment	:	Based on available data, the classification criteria are not met. Did not show teratogenic effects in animal experiments.

4,4'-methylenediphenyl diisocyanate:

Effects on foetal development	:	Species: Rat, female Application Route: Inhalation Dose: 0 - 1 - 4 - 12 mg/m3 12 mg/m3 4 mg/m3 Number of exposures: 6 hours/day Method: OECD Test Guideline 414
Reproductive toxicity - Assessment	:	Based on available data, the classification criteria are not met. Did not show teratogenic effects in animal experiments.

STOT - single exposure

Product:

Remarks: Not applicable

Components:

Polymeric MDI:

Exposure routes: Inhalation
Target Organs: Respiratory organs
Assessment: May cause respiratory irritation.

4,4'-methylenediphenyl diisocyanate:

Exposure routes: Inhalation Target Organs:
Respiratory Tract Assessment: May cause
respiratory irritation.

STOT - repeated exposure

Components:

Polymeric MDI:

Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause damage to organs through prolonged or repeated exposure.

4,4'-methylenediphenyl diisocyanate:

Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Product:

Remarks: No data available

Components:

Polymeric MDI:

Species: Rat, male and female
NOAEL: 0,2 mg/m3
Application Route: Inhalation
Exposure time: 2 h
Number of exposures: 6 hours a day, 5 days a week
Dose: 0 - 0,2 - 1 - 6 mg/m3
Method: OECD Test Guideline 453

4,4'-methylenediphenyl diisocyanate:
Species: Rat, male and female
NOAEL: 0,2 mg/m3
Application Route: Inhalation
Exposure time: 2 hrs
Number of exposures: 6 hours/ day, 5 days/ week
Dose: 0 - 0,2 - 1 - 6 mg/m3
Method: OECD Test Guideline 453
Target Organs: Lungs, Nasal inner lining

Aspiration toxicity

Components:

Polymeric MDI:
No aspiration toxicity classification

4,4'-methylenediphenyl diisocyanate:
No aspiration toxicity classification

Further information

Product:

Remarks: No data available

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available

Components:

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: > 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Method: OECD Test Guideline 211

bis(isopropyl)naphthalene:

Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): > 0,5 mg/l Exposure time: 96 h Test Type: semi-static test Method: Directive 67/548/EEC, Annex V, C.1. GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1,7 mg/l Exposure time: 48 h Test Type: semi-static test Method: OECD Test Guideline 202 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,013 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test
M-Factor (Chronic aquatic toxicity)	:	1

Terphenyl, hydrogenated:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,34 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes

4,4'-methylenediphenyl diisocyanate:

Toxicity to algae	:	ErC50 (Scenedesmus subspicatus): > 1.640 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes

DIPHENYLMETHANE DIISOCYANATE:

Toxicity to algae	:	ErC50 (Scenedesmus subspicatus): > 1.640 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: > 10 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Method: OECD Test Guideline 211

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

Components:

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

Biodegradability : Test Type: aerobic
Result: Not readily biodegradable.

bis(isopropyl)naphthalene:

Biodegradability : Test Type: aerobic
Result: Not readily biodegradable.
Method: OECD Test Guideline 310
GLP: yes

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: No data available

Components:

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

Partition coefficient: n-octanol/water : log Pow: 4,51 (22 °C)
pH: 7
Method: OECD Test Guideline 117

bis(isopropyl)naphthalene:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): > 500
Method: OECD Test Guideline 305
GLP: yes

Terphenyl, hydrogenated:

Partition coefficient: n-octanol/water : log Pow: 6,5
Method: OECD Test Guideline 117
GLP: yes

4,4'-methylenediphenyl diisocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Exposure time: 28 d
Concentration: 0,00008 mg/l
Bioconcentration factor (BCF): 200
Method: OECD Test Guideline 305
GLP: yes

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB)..

12.6 Other adverse effects

Product:

Additional ecological information	:	Remarks: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	In accordance with local and national regulations. Container hazardous when empty. Do not dispose of with domestic refuse. Do not mix waste streams during collection.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

14.1 UN number

ADR/RID/ADN	:	UN 3082
IMDG	:	UN 3082
IATA	:	UN 3082

14.2 UN proper shipping name

ADR/RID/ADN	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Bis(isopropyl)naphthalene isomers)
IMDG	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Bis(isopropyl)naphthalene isomers)
IATA	:	Environmentally hazardous substance, liquid, n.o.s. (Bis(isopropyl)naphthalene isomers)

14.3 Transport hazard class(es)

ADR/RID/ADN	:	9
IMDG	:	9
IATA	:	9

14.4 Packing group

ADR/RID/ADN

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9
Remarks	:	ADR: These substances when carried in single or

combination packagings containing a net quantity per single or inner packaging of 5 l or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids, are not subject to any other provisions of ADR provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

IMDG

Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Remarks	:	IMDG: Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 l or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provisions of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In thecase of marine pollutants also meeting the criteria for inclusion in another hazard class all provisions of this Code relevant to any additional hazards continue to apply. IMDG Code segregation group - none

IATA

Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Packing group	:	III
Labels	:	9
Remarks	:	IATA: These substances when transported in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less far liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

14.5 Environmental hazards

ADR/RID/ADN

Environmentally hazardous	:	yes

IMDG

Marine pollutant	:	yes

IATA

Environmentally hazardous	:	yes

14.6 Special precautions for user

Remarks	:	The transport of dangerous goods, including their loading and unloading, must be done by people who received the necessary training required by Modal Regulations.

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

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)	:	Polymeric MDI 4,4'-methylenediphenyl diisocyanate
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Terphenyl, hydrogenated
REACH - List of substances subject to authorisation (Annex XIV)	:	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.

		Quantity 1	Quantity 2
E2	ENVIRONMENTAL HAZARDS	200 t	500 t

15.2 Chemical safety assessment

Not applicable

SECTION 16: Other information

Full text of H-Statements

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.
H411	:	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Chronic	:	Chronic aquatic toxicity
Asp. Tox.	:	Aspiration hazard
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

Further information

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

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