



Safety data sheet

1. Substance/preparation and company identification

Trade name:

ASTI-B

Application of the substance/ the preparation:

Chemical

BEIL

Kunststoff-Produktions- und Handelsgesellschaft mbH

Lehmkuhlenweg 9

D- 31224 Peine

Telefon: +49 (0)5171/70 99-0

Telefax: +49 (0)5171/7099-29

E-Mail: service@beil-peine.de

Information in case of emergency:

Giftzentrale Göttingen

Tel.: +49 (0)551/19240

Telefax: +49 (0)551/3831881

2. Potential dangers

2.1 Classification of the substance or mixture

Product definition UVCB (real substances of (partially) unknown structure, of variable composition or of biological origin)

Classification acc. to Regulation (EC) no. 1272/2008 [CLP/GHS]

Acute Tox. 4, H332	Acute toxicity, inhale	Category 4	H332
Skin Irrit. 2, H315	Caustic / irritating effect on the skin	Category 2	H315
Eye Irrit. 2, H319	Severe damage to the eyes / eye irritation	Category 2	H319
Resp. Sens. 1, H334	Sensitisation of the respiratory tract	Category 1	H334
Skin Sens. 1, H317	Sensitisation of the skin	Category 1	H317
Carc. 2, H351	Carcinogenicity	Category 2	H351
	specific target organ – toxicity		
STOT SE 3, H335	(single exposure) [irritation of the respiratory tract]		Category 3
	H335		
STOT RE 2, H373	(repeated exposure) [respiratory tract]	Category 2	H373

Classification acc. to Regulation 67/548/EEC [Dangerous Substances Directive]

Carc. Cat. 3; R 40	Carcinogenicity	Category 3	
	R 40	Limited evidence of a carcinogenic effect	
Xn; R 20-48/20	Xn	Harmful	
	R 20	Harmful when inhaled	
	R 48/20	Harmful: Danger of serious damage to health in case of prolonged exposure by inhaling	
Xi; R36/37/38-42/43	Xi	Irritant	
	R 36/37/38	Irritates the eyes, respiratory organs and the skin	
	R 42/43	Sensitisation possible by inhaling and skin contact	



2.2 Labelling elements

Danger pictographs



Signal word

Danger

Danger information

H332 Harmful when inhaled
 H351 Causes skin irritation
 H319 Causes severe eye irritation
 H334 Can cause allergies, asthma-type symptoms or breathing difficulties when inhaled.
 H317 Can cause allergic skin reactions
 H351 May presumably cause cancer
 H335 Can irritate the respiratory tract
 H373 Can damage organs in case of longer or repeated exposure

Safety information

Prevention

P260 Do not inhale vapour and spray
 P280 Wear protective gloves / protective clothing / eye protection / face protection
 P285 Wear respiratory protection in case of insufficient ventilation

Reaction

P304+P340 WHEN INHALED: remove the person involved to fresh air and bring into a position that facilitates breathing
 P302+P352 IN CASE OF SKIN CONTACT: Wash with plenty of soap and water.
 P305+P351+P338 IN CASE OF EYE CONTACT: Rinse carefully with water for several minutes. If possible, remove any contact lenses. Continue to rinse.
 P309+P311 IN CASE OF exposure or indisposition call the POISON CONTROL CENTRE or a physician.

Storage

not applicable

Disposal

not applicable

Additional information

EUH204 contains isocyanate. Can cause allergic reactions

2.3 Other dangers

The substance fulfils the criteria acc. to Regulation (EC) no. 1907/2006, Appendix XIII

PBT: no P: no B: no T: no

vPvB: no vP: no vB: no

other dangers not leading to a classification not available



3. Composition / details on ingredients

Substance/preparation UVCB (real substances of (partially) unknown structure, of variable composition or of biological origin)

Ingredient	Identifiers	% by weight	Classification	
			67/548/EEC	1272/2008
Isocyanic acid, polymethylene polyphenylene ester	EC: Polymer CAS: 9016-87-9	60 - 100	Carc. Cat. 3;R 40 Xn; R20-48/20 Xi; R36/37/38-42/43	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
4.4'-methylene-diphenyl-diisocyanate	REACH: 01-2119457014-47 EC: 615-005-00-9 CAS: 101-68-8	30 - 60	Carc. Cat. 3;R 40 Xn; R20-48/20 Xi; R36/37/38-42/43	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

4. First aid measures

4.1 Description of first aid measures

Eye contact	in case of contact, rinse the eyes with plenty of water for at least 15 minutes. Immediately inform a physician.
Inhaling	if inhaled, remove to the fresh air. In case of apnea provide artificial respiration. Immediately inform a physician. The treatment is symptomatic for primary irritation or bronchospasms. In case breathing difficulties occur, a qualified person shall administer oxygen.
Skin contact	after contact with the skin, immediately wash with plenty of warm soapy water. If irritation occurs, seek medical assistance. Wash clothing before wearing again. Clean shoes thoroughly before using again. An MDI survey has shown that a polyglycol-based skin cleanser or corn oil may be more effective than soapy water.
Swallowing	does not induce vomiting except when instructed to do so by medical personnel. Never administer anything by mouth to an unconscious person. If conscious, get the patient to rinse his/her mouth with water. Consult a physician in case of complaints.

Protection of persons providing first aid no measures may be taken that pose a personal risk or that have not been sufficiently trained.



First aid measures (continuation)

4.2 Most important acute or delayed symptoms and effects

Potential acute effects on health

Eye contact	irritates the eyes
Inhaling	LC ₅₀ (rat) approx. 490 mg/m ³ (4 hours) using an experimentally produced spray with an aerodynamic diameter of <5 µm this product is irritant and sensitising when inhaled. Repeated inhaling of concentrations of the vapours or sprays exceeding the stated limit value can lead to sensitisation of the respiratory tract. The following symptoms may occur, amongst others: Irritation of the eyes, nose, throat and lungs, probably together with a dry throat, a feeling of tightness of the chest and breathing difficulties. An extremely intense reaction to minimum MDI concentrations may occur in sensitised individuals.
Skin contact	irritates the skin. Sensitisation possible by skin contact Animal experiments have shown that skin contact with substances known to sensitise the respiratory tract such as e.g. diisocyanate, can cause sensitisation of the respiratory tract. These results show how important it is to always wear protective clothing, including gloves, when handling these chemicals or performing maintenance work.
Swallowing	low oral toxicity. Swallowing can lead to irritation of the gastrointestinal tract.

Signs / symptoms of overexposure

Eye contact	the symptoms may include: pain or irritation, watery and bloodshot eyes
Inhaling	the symptoms may include: irritation of the respiratory tract, coughing, shortness of breath – breathing difficulty, asthma
Skin contact	the symptoms may include: irritation, erythema
Swallowing	no specific data

4.3 information regarding immediate medical assistance or special treatment

Information for the physician	when combustion products are inhaled, symptoms may occur with retarded effect. The person affected must remain under medical supervision for 48 hours if possible.
Particular treatment	symptomatic treatment and supporting therapy as indicated. The patient should remain under medical supervision for at least 48 hours after severe exposure.

5. Fire-fighting measures

5.1 Extinguishing agents

suitable extinguishing agents	foam, CO ₂ , dry extinguishing agents or gaseous extinguishing agents
unsuitable extinguishing agents	if no other extinguishing agents are available, large quantities of water may be used for extinguishing purposes. The reaction of water with hot cyanate may be violent. Extinguishing water may not be allowed to enter into waters, provide barriers. Cool containers exposed to the fire with a water spray jet.



Fire-fighting measures (continuation)

5.2 Particular dangers emanating from the substance or mixture

No particular dangers

Dangerous thermal decomposition products

The following materials may belong to the decomposition products
carbon dioxide, carbon monoxide, nitrogen oxides

5.3 Information for fire-fighting

Particular precautionary measures for fire brigade personnel

in the event of a fire, immediately cordon off the scene of the event and evacuate all persons from the danger zone. No measures may be taken that pose a personal risk or that have not been sufficiently trained..

Particular protective equipment for fire-fighting

Fire-fighters should wear suitable protective clothing and self-contained breathing equipment with full-face protection, operating in overpressure mode. PVC boots, protective gloves, safety helmet and protective clothing should be worn.

Additional information

During reaction of the product with water, CO₂ gas is produced. In firmly closed containers there may later be a dangerous pressure build-up. Containers may burst in the event of overheating.

6. Measures to be taken in the event of accidental release

6.1 Personal precautionary measures, protective equipment and procedures to be applied in emergencies

For persons other than rescue workers

no measures may be taken that pose a personal risk or that has not been sufficiently trained. Evacuate the surrounding area. Do not allow access to unprotected personnel not required in the area. Do not touch or step on spilt substances. Avoid inhaling vapour or mist. Ensure sufficient ventilation. Wear respiratory protection in case of insufficient ventilation Put on suitable protective equipment.

For emergency service providers

If special clothing is required for handling the spilt substance, section 8 that deals with suitable and unsuitable materials must be observed. See also the information in "for persons other than rescue workers".

6.2 Environmental protection measures

Avoid the spreading and the drainage of released material as well as the contact with soils, waters, drains and sewage pipes

6.3 Methods and material for retention and cleaning

Small released quantities

Remedy the leakage if this is safely possible. Remove the container from the outlet area. Absorb with an inert dry material and fill into a suitable waste container. Dispose of via an



authorised waste disposal company.

Measures to be taken in the event of accidental release (continuation)

Large released quantities

If the product is in a solid state: Spilt MDI flakes should be taken up carefully. The area should be cleaned using a vacuum cleaner to fully remove any residual dust particles. If the product is in a liquid state: Take up using sand, soil or a similar absorbing material. Allow to react for at least 30 minutes. Do not take up in sawdust or other combustible substances. Shovel into open-top barrels for further decontamination. Clean the contaminated area with water.

Measure the concentration of the MDI vapours in the air. Neutralise a small quantity with a decontamination agent. Remove residues and dispose of them properly. The composition of the liquid contaminations is stated in section 16.

6.4 Reference to other sections

Section 1	for contact information in an emergency
Section 8	personal protective equipment
Section 13	Information on disposal

7. Handling and storage

7.1 Protective measures for safe handling

Protective measures

Put on suitable protective equipment (see section 8). Persons with a history of over-sensitive skin or persons suffering from asthma, allergies or chronic or repeated diseases of the respiratory tract should not be deployed in processes in which this product is used. Avoid exposure – obtain particular instructions before use. Read and understand all safety instructions before use. Do not allow to contact the eyes, skin or clothing. Do not inhale vapour or mist. Do not consume. Only use if sufficient ventilation is available. Wear respiratory protection equipment in case of insufficient ventilation. Store in the original container or an approved substitute container that was made of compatible material. Keep firmly closed when not in use. Empty container contain product residues and may be dangerous. Do not re-use containers.

Advice regarding general work hygiene

Eating, drinking and smoking must be forbidden in areas in which this substance is used, stored or processed. Persons handling the substance must wash their hands and face before eating, drinking or smoking. Contaminated clothing and protective equipment must be removed before accessing the eating area. See section 8 for further details regarding hygiene measures.

7.2 Conditions for safe storage considering incompatibilities

Store between 16°C and 38°C in accordance with local regulations. Only store original containers. Protect against direct sunlight. Only store in dry, cool and well ventilated areas. Do not store together with incompatible substances (cf. section 10) and not with foods and drinks. Only store locked away. Keep the containers tightly closed and sealed until use. Carefully close any already opened containers and store in an upright position to avoid leakage. Do not store in unlabelled containers.

7.3 Specific end applications



Recommendations	not available
specific solutions for the industrial sector	not available

8. Limitation and monitoring of exposure / personal protective equipment

8.1 Parameters to be monitored

Workstation limit values

Name of the product / ingredient	Exposure limit values
4.4' methylene diphenyl diisocyanate	TRGS 900 AGW (Germany 2/2010) Skin sensitiser Form: Vapour and spray
	Shift average value 0.05 mg/m ³ 8 hours
	Momentary value 0.10 mg/m ³ 0 hours
	Short-term value 0,05 mg/m ³ 15 minutes

Recommended monitoring procedure Employees handling or coming into contact with respiratory sensitisers should be under medical supervision. Persons with asthma-type conditions, bronchitis or skin sensitisation should not handle MDI-based products. The listed values do not apply for persons already sensitised. Sensitised persons must refrain from any further exposure.

Effect concentrations

derived No DEL values are available
predicted No PEC values are available

8.2 Limitation and monitoring of exposure

Suitable technical measures

Provide a ventilation unit or another technical facility to keep the vapours in the air below the respective limit values for exposure. The smell of MDI is only perceptible when the occupational limit value is substantially exceeded.

Personal protective measures

Hygienic measures

Always thoroughly wash hands, arms and face after handling chemical products, at the end of each working day and before eating, smoking or WC visits. Select suitable methods for the removal of contaminated clothing. Wash contaminated clothing before wearing again. Make sure that eye rinsing stations and safety showers are available in the vicinity of the working area.

Eye protection / face protection

Safety glasses compliant with an approved standard should be worn if so stated in the risk analysis, in order to avoid exposure to splashes of liquid, spray or dusts.

Physical protection

Hand protection Use chemical-resistant protective gloves acc. to standard EN374 (Protective gloves for chemicals and microorganisms). Hand protective materials offering sufficient protection are amongst others butyl rubber, chlorinated polyethylene, polyethylene, coatings of ethylene/vinyl alcohol copolymer ("EVAL"), polychloroprene (neoprene), nitrile butadiene rubber ("NBR" or "nitrile"), polyvinyl chloride ("PVC" or "vinyl"), fluoroelastomer (Viton).



Limitation and monitoring of exposure / personal protective equipment (continuation)

Contact recommended protection class		min. breakthrough time
long and/or frequent	≥ 5	>240 min
short-term	≥ 3	>60 min

Contaminated gloves must be decontaminated and disposed of.

The selection of a specific glove for a certain application and duration of use should consider all necessary workstation-related factors including, but not limited to the chemicals used, the physical requirements (cut/ puncture resistance, heat protection), as well as the instructions/specifications of the glove manufacturer.

Note The use of protective gloves is recommended when handling freshly produced polyurethane products, as the surface of these products still contains traces of the initial and consequential products, which may have a detrimental effect on health.

Physical protection Before handling this product, the personal protective equipment should be selected on the basis of the work to be carried out and the risks involved and should be approved by a specialist.
Recommended: Overalls (preferably thick cotton) or Tyvek-Pro Tech 'C', Tyvek Pro Tech 'F' disposable protective suit.

Other skin protection Select suitable footwear and additional skin protection measures based on the work to be performed and the associated dangers and have them previously approved by an expert.

Respiratory protection Wear respiratory protection in case of insufficient ventilation. The selection of respirators must be based on the known or anticipated concentrations, the hazards for the product and the work safety limit values of the respective respirator.

Limitation of the monitoring of environmental exposure

Emissions of ventilation and processing equipment should be examined to ensure that they comply with the requirements of environmental protection laws. In some cases, exhaust air washers, filters or technical modifications to the processing equipment may be necessary to reduce the emission to acceptable values.

9. Physical-chemical properties

9.1 Information regarding basic physical and chemical properties

Form		Liquid
Colour		brown
Smell		slightly musty
Odour threshold		not available
Melting point	°C	not available
Boiling point	°C	not available



Flash point	°C	230
Ignition capability	°C	not available
Spontaneous ignition	°C	not available
Ignition temperature	°C	not available

Vapour pressure at 20°C	mbar	not available
Vapour density		8.5
Evaporation rate		not available
Explosion limits	Vol%	non-explosive
Solubility		
- Water		insoluble in water
- Octanol/water distribution coefficient		not applicable, reacts with water and octanol
pH-value		not applicable
Density at 25°C approx.	g/cm ³	1.23
Viscosity at 25°C approx.	mPas	200

9.2 Other details none

10. Stability and reactivity

10.1 Reactivity

No specific data is available for this product or its ingredients

10.2 Chemical stability

10.3 Possibility of dangerous reactions

Carbon dioxide is released upon reaction with water (moisture). Reacts exothermically with substances containing active hydrogen groups. The reaction becomes gradually stronger and can be violent at higher temperatures, if the miscibility of the reaction partners is good or is supported by agitation or by the presence of solvents. MDI is insoluble in water and heavier. It sinks to the floor. But reacts slowly at the interface. A solid, water-insoluble layer of polyurea emanates at the interface and releases carbon dioxide.

10.4 Conditions to be avoided

Avoid higher temperatures

10.5 Incompatible materials

Water, alcohols, amines, lyes and acids

10.6 Hazardous decomposition products

Potential combustion products are Carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂ etc), hydrocarbons, HCN

11. Toxicological details

11.1 Details regarding toxicological effects

Acute toxicity

Name of the product / ingredient: *Isocyanic acid, polymethylene polyphenylene ester*

End point	Species	Dose	Exposure
LC50 inhale (Dusts and mists)	Rat, male female	310 mg/m ³	4 hours



LD50 dermal	Rabbit, male female	>9400 mg/kg	---
LD50 oral	Rat, male	>10000 mg/kg	---
<u>Name of the product / ingredient:</u> 4.4' methylene diphenyl diisocyanate			
<u>End point</u>	<u>Species</u>	<u>Dose</u>	<u>Exposure</u>
LC50 inhale (Dusts and mists)	Rat, male female	0.49 mg/l	4 hours
Irritation / cauterisation	Conclusion / Summary		not available

Sensitising substance

Name of the product / ingredient: Isocyanic acid, polymethylene polyphenylene ester

Test	Route of exposure	Species	Result
OECD 406*	Skin	Guinea-pig	non-sensitising
no official guideline	respiratory	Rat	sensitising

Name of the product / ingredient: 4.4' methylene diphenyl diisocyanate

Test	Route of exposure	Species	Result
OECD 406*	Skin	Guinea-pig	non-sensitising
no official guideline	respiratory	Guinea-pig	sensitising

*OECD 406 skin sensitisation

Conclusion / Summary not available

Mutagenicity

<u>Name of the product / ingredient</u>	<u>Test</u>	<u>Result</u>
Isocyanic acid, polymethylene polyphenylene ester	OECD 474	negative
	---	unclear

4.4'-methylene diphenyl diisocyanate EU negative
OECD 474* negative

*OECD 474 Mammalian Erythrocyte Micronucleus Test

Conclusion / Summary not available

Carcinogenicity

Name of the product / ingredient: Isocyanic acid, polymethylene polyphenylene ester

Test	Species	Exposure	Result	Route of exposure	Target organs
OECD 543*	Rat	2 years: 5 days per week	negative	inhale	---
EU	Rat	2 years:5 days per week	negative	inhale	---

Name of the product / ingredient: 4.4' methylene diphenyl diisocyanate

Test	Species	Exposure	Result	Route of exposure	Target organs
OECD 543*	Rat	2 years: 5 days per week	negative	inhale	Lungs

* OECD 453 Combined Chronic Toxicity / Carcinogenicity Studies

Reproduction toxicity

Name of the product / ingredient: Isocyanic acid, polymethylene polyphenylene ester

Test	Species	Result	Target organs
OECD 414*	Rat	inhale ---	

* OECD 414 Prenatal Developmental Toxicity Study

Teratogenicity

Name of the product / ingredient	Test	Species	Result
Isocyanic acid, polymethylene polyphenylene ester	OECD 414*	Rat, male female	4 mg /m ³
4.4'-methylene diphenyl diisocyanate	OECD 414*	Rat, male female	12 mg /m ³

* OECD 414 Prenatal Developmental Toxicity Study

Specific organ toxicity (after single exposure)

<u>Name of the product / ingredient</u>	<u>Category</u>	<u>Route of exposure</u>	<u>Target organs</u>
Isocyanic acid, polymethylene polyphenylene ester	Category 3	inhale	Irritation of the respiratory tract
4.4' methylene diphenyl diisocyanate	Category 3	inhale	Irritation of the respiratory tract



Toxicological details (continuation)

Specific organ toxicity (after repeated exposure)

Name of the product / ingredient	Category	Route of exposure	Target organs
Isocyanic acid, polymethylene polyphenylene ester	Category 2	inhale	Respiratory tract
4.4' methylene diphenyl diisocyanate	Category 2	inhale	Respiratory tract

Aspiration hazard not available

Information regarding probable exposure routes not available

Potential acute effects on health

Inhaling	LC50 (rat) approx. 490 mg/m ³ (4 hours) using an experimentally produced spray with an aerodynamic diameter of <5 µm this product is irritant and sensitising when inhaled. Repeated inhaling of concentrations of the vapours or sprays exceeding the stated limit value can lead to sensitisation of the respiratory tract. The following symptoms may occur, amongst others: Irritation of the eyes, nose, throat and lungs, probably together with a dry throat, a feeling of tightness of the chest and breathing difficulties. An extremely intense reaction to minimum MDI concentrations may occur in sensitised individuals.
Swallowing	low oral toxicity. Swallowing can lead to irritation of the gastrointestinal tract.
Skin contact	irritates the skin. Sensitisation possible by skin contact Animal experiments have shown that skin contact with substances known to sensitise the respiratory tract such as e.g. diisocyanate, can cause sensitisation of the respiratory tract. These results show how important it is to always wear protective clothing, including gloves, when handling these chemicals or performing maintenance work.
Eye contact	irritates the eyes

Symptoms due to the physical, chemical and toxicological properties

Inhaling	the symptoms may include: irritation of the respiratory tract, coughing, shortness of breath – breathing difficulty, asthma
Swallowing	no specific data
Skin contact	the symptoms may include: irritation, erythema
Eye contact	the symptoms may include: pain or irritation, watery and bloodshot eyes

Delayed and immediate as well as chronic effects of short-term and longer-term exposure

Short-term exposure

potential immediate effects	not available
potential delayed effects	not available

Long-term exposure

potential immediate effects	not available
potential delayed effects	not available

Potential chronic effects on health

Name of the product / ingredient	Test	Type of result	Result	Target organs
Isocyanic acid		NOEC,		
polymethylene polyphenylene ester		OECD 453*	Dusts and mists	0.2 mg/m ³

* OECD 453 Combined Chronic Toxicity / Carcinogenicity Studies

Conclusion / Summary not available



Toxicological details (continuation)

Carcinogenicity Rats were exposed to a breathable MDI polymer spray over a period of two years, which in case of high concentrations led to chronic irritation of the lungs. A significant incidence of a benign lung tumour (adenoma) and a malignant tumour (carcinoma) was only established at the highest concentration (6mg/m³). No lung tumours occurred with 1 mg/m³; no effects with 0.2 mg/m³. All in all the frequency of benign and malignant tumours and the number of animals with tumours did not differ from the examination. The increased incidence of lung tumours is associated with the longer irritation of the respiratory tract and the associated accumulation of yellow material in the lung, which was established during the entire study. Tumour formation is extremely unlikely if a longer exposure to higher concentrations is not given, which leads to chronic irritation and lung damage.

Mutagenicity no particular effects or hazards known

Teratogenicity no particular effects or hazards known

Effects on development

No defects on newly-born animals were established in two independent animal experiments (rat). At high doses that were highly toxic for the mother (including lethal), fetal toxicity was observed. There was no fetal toxicity upon non-toxic maternal doses. The doses used in these experiments were maximum breathable concentrations far beyond the defined AGK values.

Effects on fertility not available

Other details not available

12. Environmental details

12.1 Toxicity

Name of the product / Test Ingredient	End point	Exposure	Species	Result
Isocyanic acid, polymethylene polyphenylene ester	OECD 209*	acute EC50	3 hours static	bacteria >100 mg/l
	OECD 202*	acute EC50	24 hours static	daphnia >1000 mg/l
	OECD 203*	acute LC50	96 hours static	fish >1000 mg/l
	OECD 201*	chronic EC50	72 hours static	algae >1640 mg/l
	not official	chronic NOEC	112 days static	daphnia >10000 mg/l
	OECD 211*	chronic NOEC	21 days ½ static	daphnia >10 mg/l
	not official	chronic NOEC	112 days static	fish >10000 mg/kg
	not official	chronic NOEC	112 days static	algae >10000 mg/l
4.4' methylene diphenyl diisocyanate	OECD 209*	acute EC50	3 hours static	bacteria >100 mg/l
	OECD 202*	acute EC50	24 hours static	daphnia >1000 mg/l
	OECD 203*	acute LC50	96 hours static	fish >1000 mg/l
	OECD 211*	chronic NOEC	21 days ½ static	daphnia >10 mg/l

*OECD 209 Activated Sludge, Respiration Inhibition Test

*OECD 202 Daphnia sp. Acute Immobilisation Test

*OECD 203 Fish, Acute Toxicity Test

*OECD 201 Alga, Growth Inhibition Test



*OECD 211 Daphnia Magna Reproduction Test
not official, no official guideline

12.2 Persistence and degradability

Name of the product / ingredient	Test	Period	Result
Isocyanic acid, polymethylene polyphenylene ester	OECD 302C*	28 days	0 %
4.4' methylene diphenyl diisocyanate	OECD 302C*	28 days	0 %

*OECD 302C Inherent Biodegradability: Modified MITI Test (II)

Name of the product / ingredient	aquatic Half-life time	photolysis	biological Degradability
Isocyanic acid, polymethylene polyphenylene ester	Fresh water 0.8 days	---	not light
4.4' methylene diphenyl diisocyanate	---	---	not light

12.3 Bio-accumulation potential

Name of the product / ingredient	LogPow	BCF	Potential
Isocyanic acid, polymethylene polyphenylene ester	---	200	high
4.4' methylene diphenyl diisocyanate	---	200	high

12.4 Mobility in soil Distribution coefficient soil / water (K_{oc}) not available

12.5 Results of PBT and vPvB assessment

PBT	PBT: no	P: no	B: no	T: no
vPvB	vPvB no	vP: no	vB: no	

12.6 Other harmful effects no particular effects or hazards known

12.7 Other ecological information

13. Information on disposal

The information in this section contains general advice and instructions. The list of identified uses in section 1 should be referred to for all application-specific information in the exposure scenario / exposure scenarios.

13.1 Procedure for waste disposal

Product

Disposal methods	Waste generation should be avoided or minimised. Avoid the spreading and the drainage of released material as well as the contact with soils, waters, drains and sewage pipes The disposal of this product and its solutions and ancillary products must take place at any time under observation of the environmental protection requirements and waste disposal laws as well as the requirements of the local authorities.
hazardous waste	yes

Information on disposal (continuation)

European Waste Catalogue (EWC)	Waste code	Waste designation
--------------------------------	------------	-------------------



08 05 01* Isocyanate waste
 16 03 05* organic waste, containing hazardous substances
 * requiring particular monitoring

Packaging

Disposal methods Waste generation should be avoided or minimised. Packaging waste should be recycled. Incineration or landfilling should only be considered recycling cannot be implemented.

Precautionary measures Waste and containers must be disposed of in a secure manner. Take care when handling empty containers that have not been cleaned or rinsed. Empty containers and linings can contain product residues. Avoid the spreading and the drainage of released material as well as the contact with soils, waters, drains and sewage pipes

14. Transport details

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 UN number	not applicable	not applicable	not applicable	not applicable
14.2 UN dispatch designation	---	---	---	---
14.3 Transport hazard classes	---	---	---	---
14.4 Packaging group	---	---	---	---
14.5 Environmental hazards	no	no	no	no
14.6 Particular precautionary measures for the user	not available	not available	not available	not available
Additional information	---	---	---	---
14.7 Bulk transport acc. to Appendix II of MARPOL 73/78 and IBC Code	not applicable			

15. Legal regulations

15.1 Safety, health and environmental provisions / laws, especially for the substance or mixture

EC Regulation (EC) No. 1907/2006 (REACH)

Appendix XIV List of substances subject to approval, substances of particularly high concern
 none of the components are listed

Appendix XIV Limitation of the manufacture, placing on the market and use of certain hazardous substances, mixtures and products
 not applicable

Other EU provisions

- European inventory all components are listed or excluded
- Black list chemicals not listed
- Priority list chemicals not listed
- integrated avoidance and reduction of environmental pollution – air not listed
- integrated avoidance and reduction of environmental pollution – water not listed



Legal regulations (contination)

Name of the product / ingredient	carcinogenic Effects	mutagenic Effects	Effects on the Development	Effects on the Fertility
Isocyanic acid, polymethylene polyphenylene ester	Cara. 2, H351	---	---	---
4.4' methylene diphenyl diisocyanate		Cara. 2, H351	---	---

National regulations

Storage class	10
Water hazard class	1 Appendix No 3
German Technical Guidelines on Air Quality Control	TA-Air number 5.2.5
AOX	the product contains organically combined halogens and can contribute to the AOX value in waste water

International regulations

Chemical weapons convention, list I chemicals	not listed
Chemical weapons convention, list II chemicals	not listed
Chemical weapons convention, list III chemicals	not listed

15.2 Material safety assessment not yet completed

16. Other details

marks information modified since the last version

Abbreviations and acronyms	
ATE	Acute toxicity estimation
CLP	Classification, labelling and packaging regulation [Regulation (EC) No. 1272/2008]
DNEL	derived non-effect limit value
EUH rate	CLP-specific hazard warning
PNEC	presumed non-effect limit value
PRN	REAC registration number
UVCB	real substances with (partially) unknown structure

Procedure for the derivation of classification acc. to

Regulation (EC) no. 1272/2008 [CLP/GHS]	Classification	Substantiation
	Acute Tox. 4, H332	Calculation method
	Skin Irrit. 2, H315	Calculation method
	Eye Irrit. 2, H319	Calculation method
	Resp. Sens. 1, H334	Calculation method
	Skin Sens. 1, H317	Calculation method
	Carc. 2, H351	Calculation method
	STOT SE 3, H335	Calculation method
	STOT RE 2, H373	Calculation method

Full text of

- abbreviated H-phrases	
H332	harmful when inhaled
H315	causes skin irritations
H319	causes severe eye irritation
H334	can cause allergies, asthma-type symptoms or breathing difficulties when inhaled.
H317	can cause allergic skin reactions



H351 may presumably cause cancer
 H335 can irritate the respiratory tract
 H373 can damage organs in case of longer or repeated exposure

Other details (continuation)

- Classification

[CLP/GHS]

Acute Tox. 4, H332 acute toxicity, inhale - category 4
 Skin Irrit. 2, H315 Caustic / irritating effect on the skin - Category 2
 Eye Irrit. 2, H319 sever eye damage/eye irritation - Category 2
 Resp. Sens.1, H334 Sensitisation of the respiratory tract - Category 1
 Skin Sens. 1, H317 Sensitisation of the skin- Category 1
 Carc. 2, H351 Carcinogenicity – Category 2
 STOT SE 3, H335 (single exposure) [irritation of the respiratory tract],
 Category 3
 STOT RE 2, H373 (repeated exposure) [respiratory tract], Category 2

- abbreviated R-phrases

R 40 Limited evidence of a carcinogenic effect
 R 20 harmful when inhaled
 R 48/20 Harmful: Danger of serious damage to health in case of
 longer exposure by inhaling
 R 36/37/38 irritates the eyes, respiratory organs and the skin
 R 42/43 Sensitisation by inhaling and skin contact

- Classifications

[DSD/DPD]

Carc. Cat. 3 carcinogenic, Category 3
 Xn harmful
 Xi irritant

Information for the reader

Although the information and recommendations in this publication are based on our general experience and are communicated in accordance with our best knowledge and belief, NONE OF THE INFORMATION CONTAINED HEREIN SHALL BE INTERPRETED AS EXPRESSLY IMPLIED OR OTHER GUARANTEE, WARRANTY OR ASSURANCE.

THE USER IS ALWAYS RESPONSIBLE FOR THE DETERMINATION AND INSPECTION THAT SUCH INFORMATION AND RECOMMENDATIONS APPLY TO HIM/HER, AND THAT ALL PRODUCTS ARE SUITABLE AND FIT FOR THE INTENDED USE OR PURPOSE.

UNKNOWN HAZARDS AMY ENANATE FROM THE STATED PRODUCTS. THEY MUST THEREFORE BE USED WITH CARE. EVEN IF ATTENTION IS DRAWN TO CERTAIN HAZARDS IN THIS PUBLICATION, NO GUARANTEE CAN BE GIVEN THAT THESE ARE THE ONLY EXISTING HAZARDS.

Hazards, toxicity and behaviour of the products can change when used with other materials and depend on the manufacturing procedure or other processes. Hazards, toxicity and behaviour must be established by the user and communicated to all persons transporting, processing or using the product as the end consumer.

Liquid detoxification agents (by weight or volume %):

Detoxification agent 1 - Sodium carbonate: 5 - 10%
 - Liquid cleaning agent: 0.2 - 2%
 - Water: Rest up to 100%



Detoxification agent 2: - Concentrated ammonia solution: 3 - 8%
- Liquid cleaning agent: 0.2 - 2% *
- Water: Rest up to 100%

Detoxification agent 1 reacts more slowly with diisocyanate, but is more environmentally compatible than detoxification agent 2.

Other details (continuation)

Detoxification agent 2 contains ammonia: Ammonia poses a health threat. (see safety information of the supplier.)

Literature source: PU 193-1: 'Verbindungen auf MDI-Basis: Gefahren und Sicherheitsmaßnahmen'.

PU181-15 : Empfohlene Aufschmelzverfahren für Isocyanate auf MDI-Basis.

ISOPA Richtlinien für sicheres Laden/Entladen, Transportieren, Lagern von TDI und MDI, Ref. 3722/ISOPA.DH/November 1995.

SPI PMDI User Guidelines for the Chemical Protective Clothing Selection.

Information regarding methods used in the part dealing with physical-chemical properties is found in Appendix V, Part A of Directive 92/69/EC G of the Commission dated 31. July 1992, Directive 67/548/EEC of the Council adapted to technical progress for the 17th time.