

Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

Page 1 of 6

1 Identification of the Substance/Preparation and the Company

Product Name: **Hardener for Höhne-PU**
Application: Hardener component for the production of polyurethanes.
Producer/Supplier: HÖHNE GmbH
Mühlenstraße 76
D-25421 Pinneberg (Germany)
Telephone: +49 - (0)4101 / 5453 - 0 / Fax: - 33
Internet: www.hoehne.de / E-Mail: info@hoehne.de
Emergency Phone No.: In an emergency dial your local Emergency Call.
Keep this Safety Data Sheet at hand.

*2 Composition / Information on Ingredients

Diphenylmethane-diisocyanate, isomers und homologues.

Weight %: > 98

CAS-No.: 9016-87-9

Index No.: ---

EEC No.: ---

Classification: Xn R 20; Xi R 36/37/38; R 42/43

Specific Threshold Concentration:

Xn ; R 42 = from 0,1 %

Xn ; R 42/43 = from 1 %

Xn ; R 36/37/38 - 42/43 = from 5 %

Xn ; R 20 - 36/37/38 - 42/43 = from 25 %

Classification/labelling analogous to Index No.: 615-005-00-9

3 Hazards Identification

R 20: Harmful by inhalation.

R 36/37/38: Irritating to eyes, respiratory system and skin.

R 42/43: May cause sensitisation by inhalation and skin contact.

For their own protection, persons who suffer from hypersensitivity of the respiratory tract (e.g. asthmatics and chronic bronchitis sufferers) should avoid handling this product.

Symptoms affecting the respiratory tract can also occur several hours after overexposure.

Vapours and aerosols are the primary risk to the respiratory tract.

*4 First-Aid Measures

General:

Soiled, soaked clothing and shoes must be immediately removed, decontaminated and disposed of.

Inhalation of aerosol or vapour in high concentrations:

Take the person into the fresh air and keep him warm, let him rest.

If there is difficulty in breathing, medical advice is required.

Skin Contact:

In the event of contact with the skin, preferably wash with a cleanser based on polyethylene glycol or with plenty of warm water and soap. Consult a doctor in the event of a skin reaction.

Eye Contact:

In the event of contact with the eyes, hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Consult an ophthalmologist.

Swallowing:

DO NOT induce the patient to vomit. Medical advice is required.

Information for the Physician:

The product irritates the respiratory tract and may trigger sensitisation of the skin and respiratory tract.

Treatment of acute irritation or bronchial constriction is primarily symptomatic.

Extended medical care may be necessary, depending on the extent of the exposure and the symptoms.

*5 Fire-Fighting Measures

Suitable Extinguishing Media:

Foam, CO₂ or dry powder. In cases of larger fires, water spray should be used.

Extinguishing Media which must not be used for safety reasons:

Water in small quantities.

Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

***5 Fire-Fighting Measures** (continued)

Special Exposure Hazards arising from the substance itself, combustion products, resulting gases:
In case of fire, formation of carbon monoxide, nitrogen oxide, isocyanate vapour, and traces of hydrogen cyanide is possible.

Fire Fighting Protective Equipment:
Firemen have to wear self-contained breathing apparatus.

Further Information:

Do not let enter contaminated extinguishing water into the soil, groundwater or surface waters.

Fire in vicinity poses risk of pressure build-up and rupture. Containers at risk from fire should be cooled with water and, if possible, removed from the danger area.

***6 Accidental Release Measures**

Personal Precautions:

Put on protective equipment (see Chapter 8). Ensure adequate ventilation/exhaust ventilation.
Keep unauthorized persons away.

Environmental Precautions:

Do not empty into drains.

Clean-up Method:

Remove mechanically. Cover remainders with wet, absorbent material (e.g. sand, sawdust, chemical binder based on calcium silicate hydrate). After approx. 1 hour transfer to waste container and do not seal (evolution of CO₂!). Keep damp in a safe ventilated area for several days.

Waste should be disposed of as described in Chapter 13.

***7 Handling and Storage**

Handling:

Ensure adequate ventilation or exhaust ventilation in the working area. The personal protective measures described in Chapter 8 must be observed. The threshold limit values noted in Chapter 8 must be monitored. Avoid contact with skin and eyes.

In all workplaces or parts of the plant where high concentrations of isocyanate aerosols and/or vapours may be generated (e.g. during pressure release, mold venting or when cleaning mixing heads with an air blast), appropriately located exhaust ventilation must be provided in order to prevent occupational exposure limits from being exceeded. The air should be drawn away from the personnel handling the product and the efficiency of the exhaust equipment should be periodically checked.

Storage:

Keep container tightly closed and dry.

Prevent cooling below 10°C and heating above 40°C. Can be warmed briefly to 50°C.

Keep separated from foodstuffs.

VCI storage class: 10

(VCI = German Association of the Chemical Industry)

***8 Exposure Controls / Personal Protection**

Protection of workers: Threshold value in air defined by TRGS 900 (MAK value):
diphenylmethane-4,4'-diisocyanate (sum of vapours and aerosols)
CAS No.: 101-68-8 0,005 ml/m³ (ppm) corresp. to 0,05 mg/m³
(8 hours average value)
maximum limit of excess factor 1

Remark: DFG, 29, 36

Attention is drawn to the relevant BAT value (TRGS 903).

Exposition assessment value (EBW) per TRGS 430:

Polyisocyanate content (MDI oligomers and/or prepolymers): 49 %.

Use an exposition assessment value (EBW) of 0,05 mg/m³.

The product may contain traces of phenylisocyanate.

Protection of workers: Threshold value in air defined by TRGS 900 (MAK value):
phenylisocyanate

CAS No.: 103-71-9 0,01 ml/m³ (ppm) corresp. to 0,05 mg/m³
(8 hours average value)
maximum limit of excess factor 1

Remark: ARW, 36

Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

***8 Exposure Controls / Personal Protection** (continued)

Personal Protection:

Respiratory Protection: Required in inadequately ventilated workplaces. If product is sprayed, wear air-fed mask or (for short periods only) a combination of charcoal filter and particulate filter (German type A2-P2).

Hand Protection: Suitable materials for safety gloves; DIN EN 374-3:
Polychloroprene - CR: thickness $\geq 0,5$ mm breakthrough time ≥ 480 min.
Nitrile rubber - NBR: thickness $\geq 0,35$ mm breakthrough time ≥ 480 min.
Butyl rubber - IIR: thickness $\geq 0,5$ mm breakthrough time ≥ 480 min.
Fluorinated rubber - FKM: thickness $\geq 0,4$ mm breakthrough time ≥ 480 min.
Polyvinyl chloride - PVC: thickness $\geq 0,5$ mm breakthrough time ≥ 480 min.
Recommendation: Contaminated gloves should be disposed of.

Eye Protection: Wear eye/face protection.

Body Protection: Wear suitable protective clothing.

Protection and Hygienic Measures:

Keep away from foodstuffs, drinks and tobacco.

Store work clothes and street clothes separately.

Wash hands before breaks and at end of work.

Decontaminate, destroy and dispose of soiled protective clothing (see Chapter 13).

Safety precautions for handling freshly molded polyurethane parts: see Chapter 16.

***9 Physical and Chemical Properties**

tested in accordance with

Form:	liquid		
Colour:	brown		
Odour:	earthy, musty		
Initial Boiling Point:	350°C	(at 1013 mbar)	DIN 53 171
Pour Point:	< 0°C		DIN ISO 3016
Flash Point:	> 200°C		DIN EN 22719
Ignition Temperature:	> 400°C		DIN 51 794
Explosive Limits:	Limits not determined.		
Vapour Pressure:	MDI:		
	< 0,00001 mbar	(at 25°C)	
	0,00016 mbar	(at 50°C)	
Density:	approx. 1,23 g/cm ³	(at 20°C)	DIN 51 757
Viscosity:	approx. 120 mPa·s	(at 25°C)	DIN 53 019
Solubility in Water:	insoluble, reacts		
pH value	not applicable		

***10 Stability and Reactivity**

Thermal Decomposition:

Polymerises at about 200°C with evolution of CO₂.

Hazardous Decomposition Products:

No hazardous decomposition products when stored and handled correctly.

Hazardous Reactions:

Exothermic reaction with amines and alcohols. Reacts with water forming CO₂, in closed containers risk of bursting owing to increase of pressure.

***11 Toxicological Information**

The following information has been obtained on animal studies:

Diphenylmethane-diisocyanate, isomers and homologue:

Acute Toxicity:

LD₅₀ oral, rat (female): > 15000 mg/kg

LC₅₀ inhalation, rat: 490 mg as aerosol/m³, 4,0 h of exposure.

Concentration of the saturated vapour of Diphenylmethane-4,4'-diisocyanate (MDI) at 25°C: 0,09 mg/m³.

Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

11 Toxicological Information (continued)

Long-term inhalation study of tech. diphenylmethane diisocyanate (PMDI) carried out using mechanically produced, inhalable PMDI aerosols.

Aerodynamic diameter: 95 % below 5 μm
Concentrations: 0,2 ; 1,0 and 6,0 mg/m^3
Animal groups: 120 rats in each (60 female, 60 male).

Results after clinical and histopathological examination of the animals:

0,2 mg aerosols/ m^3 : No irritation of the respiratory tract or lungs - "no effect level" (NOEL).
1,0 mg aerosols/ m^3 : Slight irritation of and inflammatory changes to the nose, respiratory tract and lungs. No lung tumours.
6,0 mg aerosols/ m^3 : More severe irritation of and chronic inflammatory changes to the nose, respiratory tract and lungs. Accumulation of a yellow substance in the lungs. 8 benign (statistically increased) and 1 malignant (statistically insignificant) lung tumours were found.

The overall increased incidence of lung tumours only in the group which received the highest concentration is closely attributed to the chronic irritation of and the inflammatory changes to the respiratory organs and to the accumulation of the yellow substance in the lungs of the animals.

Irritating/Corrosive Effects:

Effect on the eyes:

Causes slight temporary reddening and swelling of the conjunctiva and slight reversible clouding of the cornea. In high concentrations vapour of product has irritating effects on eyes and mucous membranes.

Effect on the skin:

Irritant. In case of longer contact with skin, tanning and irritating effects are possible.

Effect on the respiratory tract:

In high concentrations vapour of product has irritating effects on eyes and mucous membranes.

Special Properties/Effects:

Experience on humans:

Irritation of the mucous membranes in the nose, throat and lungs, dryness of the throat, pressure on the chest, sometimes accompanied by breathing difficulties and headaches.

Delayed appearance of the symptoms and allergic reaction in susceptible persons possible.

Sensitisation:

May cause sensitisation by inhalation.

Dermal sensitisation: Not evaluable since experimental results are contradictory.

*12 Ecological Information

Do not allow to escape into waters, wastewater or soil.

Behaviour in open waters:

Immiscible in water.

Reacts with water at the interface producing CO_2 and forming a solid and insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by water-soluble solvents. Previous experience shows that polyurea is inert and non-degradable.

Data on diphenylmethane-diisocyanate, isomeres and homologues:

Biodegradability: 0 %, i.e. not degradable.

Degradation rate in 28 days.
(Method: respirometer test).

Acute fish toxicity: $\text{LC}_0 = > 1000 \text{ mg}/\text{l}$ Duration of test: 96 h

Test species: *Brachydanio rerio* (Zebra barbel)

Acute bacteria toxicity: $\text{EC}_{50} = > 100 \text{ mg}/\text{l}$ Duration of test: 3 h

Tested on activated sludge microorganism.

Acute toxicity for *Daphnia*: $\text{EC}_{50} = > 1000 \text{ mg}/\text{l}$ Duration of test: 24 h

Test species: *Daphnia magna*

Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

*13 Disposal Considerations

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used. It is among the tasks of the polluter to assign the waste to waste codes specific to industrial sectors and processes according to the European Waste Catalogue. It is recommended that details be sorted out with the waste disposer responsible.

The waste can be disposed of in a suitable incinerator under compliance with the relevant legislation. After final product withdrawal, all residues must be removed from containers (drip-free, powder-free or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated.

Containers must be recycled in compliance with national legislation and environmental regulations.

*14 Transport Information

Land transport RID/ADR: Class: --- PG: ---
Transport by sea IMDG-Code: Code: --- UN-No.: --- PG: --- EmS: --- MPO: ---
Air transport ICAO-TI/IATA-DGR: not restr.

Declaration for land shipment: ---

Declaration for sea shipment: ---

Declaration for shipment by air: ---

No dangerous cargo. Irritating to skin and eyes.

Keep dry. Avoid temperatures below +10°C. Avoid heat above +50°C.

Keep away from foodstuffs, acids and alkalis.

*15 Regulatory Information

Labelling in accordance with Annex I of directive 67/548/EEC and its amendments and adaptations:

Symbol: Xn

Hazard description: Harmful

Contains: diphenylmethane-diisocyanate, isomers and homologues

R 20: Harmful by inhalation.

R 36/37/38: Irritating to eyes, respiratory system and skin.

R 42/43: May cause sensitisation by inhalation and skin contact.

S 23: Do not breathe vapour/spray.

S 26: In case of eye contact, immediately flush eyes with plenty of water and obtain medical attention.

S 28: In case of skin contact, immediately wash with plenty of water and soap.

S 36/37: Wear suitable protective clothing and gloves.

S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

TRGS 905-Classification: Tech. ("polymer") MDI (pMDI) CAS No.: 9016-87-9
(in form of respirable aerosols, measured as the alveolar aerosol content)
cancerogenic, category 3

Any existing national regulations on the handling of isocyanates must be observed.

Water pollution class (WGK): 1 - slightly hazardous to water

WGK = Classification in accordance with the German Water Resources Act (VwVwS 1999-05-17)

Swiss law of poison: Class of poison 3; BAG-T-No. 614463.

*16 Other Information

Text of all R-phrases referred to in sections 2 and 3:

R 20: Harmful by inhalation.

R 36/37/38: Irritating to eyes, respiratory system and skin.

R 42: May cause sensitisation by inhalation.

R 42/43: May cause sensitisation by inhalation and skin contact.

For internal US delivery:

Under § 172.101, Appendix A, DOT (Department of Transportation) it is requested:

MDI Reportable Quantity (RQ): 5000 lbs. (2270 kg).



Date of Issue: 28.04.2005
Replaced Data Sheet: 18.08.2003
Product Name: Hardener for Höhne-PU

Page 6 of 6

*16 Other Information (continued)

ISOPA Guidelines for safe loading/unloading, transport and storage of TDI and MDI.
ISOPA Order No.: PSC-0005-GUIDL

Safety precaution for handling freshly molded polyurethane parts:

Depending on the production parameters, any uncovered surfaces of polyurethane moldings produced using this raw material may contain traces of substances (e.g. starting and reaction products, catalysts, release agents) with hazardous characteristics.

Skin contact with traces of these substances must be avoided. When demolding or otherwise handling freshly molded polyurethane parts, protective textile gloves must be worn as a minimum. Their palm and finger areas should preferably be coated on the outside with nitrile rubber, PVC or polyurethane.

Protective gloves should be changed daily. The wearing of protective clothing suited to the conditions normally encountered when handling freshly molded polyurethane parts is recommended.

This data sheet was prepared in accordance with the EU Directives.

In the Safety Data Sheet all chapters which have been changed since last edition are marked with an asterisk (*) in front of the chapter number.

This Safety Data Sheet replaces all previous information.

Revised and valid from: see date of issue.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The above details do not imply any guarantee concerning composition, properties or performance.