

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 05.07.2016

Version number 2

Revision: 05.07.2016

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

- **1.1 Product identifier**
- **Trade name:** Hardener 322
- **Article number:** 75970-00
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the mixture** Hardening agent/ Curing agent
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
FORBO Eurocol Deutschland GmbH
August-Roebling-Str. 2
D-99091 Erfurt
Tel.: +49 (0)361 73041-0
Fax: +49 (0)361 73041-92
Website: <http://www.forbo-bonding.de>
- **Further information obtainable from:**
Laboratory
Ronny Dorna
Ronny.Dorna@forbo.com
- **1.4 Emergency telephone number:** GGIZ +49-361-730730 (for Germany)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS05 corrosion

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
STOT SE 3 H335 May cause respiratory irritation.

Aquatic Chronic 3 H412 Harmful to aquatic life with long lasting effects.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS05



GHS07

- **Signal word** Danger

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· **Hazard-determining components of labelling:**

Hexamethylene-1,6- diisocyanate, homopolymer
 Polyoxyethylene tridecyl ether phosphate
 cyclohexyldimethylamine
 hexamethylene diisocyanate

· **Hazard statements**

H332 Harmful if inhaled.
 H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H317 May cause an allergic skin reaction.
 H335 May cause respiratory irritation.
 H412 Harmful to aquatic life with long lasting effects.

· **Precautionary statements**

P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
 P271 Use only outdoors or in a well-ventilated area.
 P302+P352 IF ON SKIN: Wash with plenty of water.
 P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 Immediately call a POISON CENTER/doctor.
 P405 Store locked up.
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Additional information:**

Restricted to professional users.
 Restricted to professional users.
 Safety data sheet available on request.
 EUH204 Contains isocyanates. May produce an allergic reaction.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.
 · **vPvB:** Not applicable.

SECTION 3: Composition/information on ingredients

· **3.2 Chemical characterisation: Mixtures**

· **Description:** Hardening agent/ Curing agent

· **Dangerous components:**

CAS: 28182-81-2 NLP: 500-060-2	Hexamethylene-1,6- diisocyanate, homopolymer ⚠ Acute Tox. 4, H332; Skin Sens. 1, H317; STOT SE 3, H335	75-<100%
CAS: 9046-01-9	Polyoxyethylene tridecyl ether phosphate ⚠ Eye Dam. 1, H318; ⚠ Aquatic Chronic 2, H411; ⚠ Skin Irrit. 2, H315	1-≤5%
CAS: 98-94-2 EINECS: 202-715-5	cyclohexyldimethylamine ⚠ Flam. Liq. 3, H226; ⚠ Acute Tox. 3, H311; Acute Tox. 2, H330; ⚠ Skin Corr. 1B, H314; ⚠ Acute Tox. 4, H302	0.1-<1%
CAS: 822-06-0 EINECS: 212-485-8 Index number: 615-011-00-1	hexamethylene diisocyanate ⚠ Acute Tox. 3, H331; ⚠ Resp. Sens. 1, H334; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	0.1-<0.5%

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· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures**· 4.1 Description of first aid measures****· General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

· After inhalation:

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.

In case of unconsciousness place patient stably in side position for transportation.

· After skin contact:

Do NOT use solvents or thinners.

Treat affected skin with cotton wool or cellulose. Then wash and rinse thoroughly with water and a mild cleaning agent.

If skin irritation continues, consult a doctor.

· After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.**· After swallowing:**

A person vomiting while laying on their back should be turned onto their side.

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; call for medical help immediately.

· 4.2 Most important symptoms and effects, both acute and delayed No further relevant information available.**· 4.3 Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

SECTION 5: Firefighting measures**· 5.1 Extinguishing media****· Suitable extinguishing agents:**

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Use fire extinguishing methods suitable to surrounding conditions.

· For safety reasons unsuitable extinguishing agents: Water with full jet**· 5.2 Special hazards arising from the substance or mixture**

Formation of toxic gases is possible during heating or in case of fire.

In case of fire, the following can be released:

Carbon monoxide and carbon dioxide

Sulphur dioxide (SO₂)

· 5.3 Advice for firefighters**· Protective equipment:** Wear self-contained respiratory protective device.**SECTION 6: Accidental release measures****· 6.1 Personal precautions, protective equipment and emergency procedures**

Keep away from ignition sources.

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Wear protective clothing.

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· **6.2 Environmental precautions:**

Do not allow to enter drains/ surface or ground water.

Inform respective authorities in case of seepage into water course or sewage system.

· **6.3 Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

· **6.4 Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: Handling and storage

· **7.1 Precautions for safe handling**

Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).

Keep receptacles tightly sealed.

Ensure good ventilation/exhaustion at the workplace.

Prevent formation of aerosols.

· **Information about fire - and explosion protection:** No special measures required.

· **7.2 Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:** Store only in the original receptacle.

· **Information about storage in one common storage facility:**

Store away from oxidising agents.

Store away from foodstuffs.

· **Further information about storage conditions:**

Store receptacle in a well ventilated area.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

Protect from humidity and water.

· **Recommended storage temperature:** +15 °C - +30 °C

· **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

822-06-0 hexamethylene diisocyanate

WEL Short-term value: 0.07 mg/m³

Long-term value: 0.02 mg/m³

Sen; as -NCO

· **DNELs**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

Inhalative NOEL 4.3 mg/m³ (rat) (OECD 412 (subacute inhalation toxicity))

· **Additional information:** The lists valid during the making were used as basis.

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· 8.2 Exposure controls**· Personal protective equipment:****· General protective and hygienic measures:**

The usual precautionary measures are to be adhered to when handling chemicals.

Do not breathe vapour/aerosol.

Remove contaminated, saturated clothing.

Use skin protection cream for skin protection.

Ensure that washing facilities are available at the work place.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing

Wash hands before breaks and at the end of work.

Do not inhale gases / fumes / aerosols.

· Respiratory protection:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

· Recommended filter device for short term use:

Combination filter A2-P2

Combination filter A-P2

Filter A1

Filter A2

· Protection of hands:

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

Butyl rubber, BR

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection: Goggles recommended during refilling**· Body protection:** Protective work clothing

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SECTION 9: Physical and chemical properties

· 9.1 Information on basic physical and chemical properties

· General Information

· Appearance:

Form:	Fluid
Colour:	Colourless
Odour:	Solvent-like
Odour threshold:	Not determined.

· pH-value: Undetermined.

· Change in condition

Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	150 °C

· Flash point: 160 °C
Not applicable.

· Flammability (solid, gaseous): Not applicable.

· Ignition temperature: 440 °C

· Decomposition temperature: Undetermined.

· Self-igniting: Product is not selfigniting.

· Danger of explosion: Product does not present an explosion hazard.

· Vapour pressure at 20 °C: <0.00001 hPa

· Density at 20 °C: 1.13 g/cm³
· Evaporation rate: Not determined.

· Solubility in / Miscibility with water: Fully miscible.

· Partition coefficient (n-octanol/water): Undetermined.

· Viscosity:

Dynamic at 20 °C: 1400 mPas

· Solvent content:

Organic solvents: 0.0 %
VOC (CE) 0.00 %

· 9.2 Other information: No further relevant information available.

SECTION 10: Stability and reactivity

· 10.1 Reactivity: No further relevant information available.

· 10.2 Chemical stability

· Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

· 10.3 Possibility of hazardous reactions

Reacts with strong oxidising agents.

Reacts with alkali (lyes).

· 10.4 Conditions to avoid: No further relevant information available.

· 10.5 Incompatible materials:

strong oxidizing agents

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alkali

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· **10.6 Hazardous decomposition products:** No dangerous decomposition products known.

SECTION 11: Toxicological information

· **11.1 Information on toxicological effects**

· **Acute toxicity**

Harmful if inhaled.

· **LD/LC50 values relevant for classification:**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

Oral	LD50	≥5000 mg/kg (rat) (OECD 423)
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Inhalative	LC50/4h	543 mg/l (rat) (OECD 403)
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822-06-0 hexamethylene diisocyanate

Oral	LD50	738 mg/kg (rat)
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Dermal	LD50	593 mg/kg (rat)
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· **Primary irritant effect:**

· **Skin corrosion/irritation**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

Irritation of skin	Dermal Irritation	slightly irrit. (rabbit) (OECD 404)
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Causes skin irritation.

· **Serious eye damage/irritation**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

Irritation of eyes	Eye Irritation	slightly irrit. (rabbit) (OECD 405)
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Causes serious eye damage.

· **Respiratory or skin sensitisation**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

Sensitisation	Skin Sens. (LLNA)	sensitizing (mouse) (OECD 429 (Skin Sensitisation: Local Lymph Node Ass))
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May cause an allergic skin reaction.

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.

· **Carcinogenicity** Based on available data, the classification criteria are not met.

· **Reproductive toxicity** Based on available data, the classification criteria are not met.

· **STOT-single exposure**

May cause respiratory irritation.

· **STOT-repeated exposure** Based on available data, the classification criteria are not met.

· **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**

28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer

LC50/96h	28.3 mg/l (Danio rerio) (OECD 203)
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EC50/48h >100 mg/l (*Daphnia magna*) (OECD 202)EC50/72h >100 mg/l (*Scenedesmus suspicatus*) (OECD 201)**822-06-0 hexamethylene diisocyanate**LC50/96h >82.8 mg/l (zebrafish (*Brachydanio rerio*)) (OECD 203)EC50/48h >89.1 mg/l (*Daphnia magna*) (OECD 202)· **12.2 Persistence and degradability** biodegradable· **Degree of elimination:****28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer**

Biodegradability 2 % / 28d (activated sludge) (OECD 301 D)

· **12.3 Bioaccumulative potential** No further relevant information available.· **12.4 Mobility in soil** No further relevant information available.· **Ecotoxicological effects:**· **Remark:** Harmful to fish· **Behaviour in sewage processing plants:**· **Type of test** **Effective concentration** **Method** **Assessment****28182-81-2 Hexamethylene-1,6- diisocyanate, homopolymer**

EC50/3h >10000 mg/l (activated sludge) (OECD 209)

822-06-0 hexamethylene diisocyanate

EC50/3h 842 mg/l (activated sludge) (OECD 209)

· **Additional ecological information:**· **General notes:**

Do not allow product to reach ground water, water course or sewage system.

Harmful to aquatic organisms

Water hazard class 1 (Self-assessment): slightly hazardous for water.

· **12.5 Results of PBT and vPvB assessment**· **PBT:** Not applicable.· **vPvB:** Not applicable.· **12.6 Other adverse effects** No further relevant information available.**SECTION 13: Disposal considerations**· **13.1 Waste treatment methods**· **Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **European waste catalogue**

08 01 11* waste paint and varnish containing organic solvents or other dangerous substances

· **Uncleaned packaging:**· **Recommendation:** Disposal must be made according to official regulations.**SECTION 14: Transport information**· **14.1 UN-Number**· **ADR, ADN, IMDG, IATA**

Void

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· 14.2 UN proper shipping name · ADR, ADN, IMDG, IATA	Void
· 14.3 Transport hazard class(es) · ADR, ADN, IMDG, IATA · Class	Void
· 14.4 Packing group · ADR, IMDG, IATA	Void
· 14.5 Environmental hazards: · Marine pollutant:	No
· 14.6 Special precautions for user	Not applicable.
· 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable.
· Transport/Additional information:	Not dangerous according to the above specifications.
· UN "Model Regulation":	Void

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3
- **National regulations:**
Harmful to aquatic organisms
Water hazard class 1 (Self-assessment): slightly hazardous for water.
- **Information about limitation of use:**
Employment restrictions concerning juveniles must be observed. (94/33/EC)
Employment restrictions concerning pregnant and lactating women must be observed. (92/85/EC)
- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H331 Toxic if inhaled.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

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H335 May cause respiratory irritation.

H411 Toxic to aquatic life with long lasting effects.

· **Department issuing SDS:** Laboratory

· **Contact:**

Dr. Amina Chnirheb

Amina.Chnirheb@forbo.com

· **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

DNEL: Derived No-Effect Level (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

ISO: International Organisation for Standardisation

PNEC: Predicted No-Effect Concentration (REACH)

SVHC: Substances of Very High Concern

Flam. Liq. 3: Flammable liquids – Category 3

Acute Tox. 3: Acute toxicity – Category 3

Acute Tox. 2: Acute toxicity – Category 2

Acute Tox. 4: Acute toxicity – Category 4

Skin Corr. 1B: Skin corrosion/irritation – Category 1B

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

Resp. Sens. 1: Respiratory sensitisation – Category 1

Skin Sens. 1: Skin sensitisation – Category 1

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3

· *** Data compared to the previous version altered.**