



Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

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

- **1.1 Product identifier**
- **Trade name: Modralit 3K Hardener**
- **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:**
Dreve Dentamid GmbH
Max-Planck-Straße 31
59423 Unna / Germany
Tel.: ++49 2303 / 8807-0
Fax.: ++49 2303 / 8807-55
- **Further information obtainable from:**
Department Research & Development
Fax.: ++49 2303 / 8807-562
Email: sicherheitsdatenblatt@dreve.de
- **1.4 Emergency telephone number:**
Tel.: ++ 49 211 / 797-3350
Plant Fire Department Henkel

2 Hazards identification

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



GHS08 health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 Carc. 2 H351 Suspected of causing cancer.
 STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.



GHS07

Acute Tox. 4 H332 Harmful if inhaled.
 Skin Irrit. 2 H315 Causes skin irritation.
 Eye Irrit. 2 H319 Causes serious eye irritation.
 Skin Sens. 1 H317 May cause an allergic skin reaction.
 STOT SE 3 H335 May cause respiratory irritation.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



Xn; Harmful

R20-40-48/20: Harmful by inhalation. Limited evidence of a carcinogenic effect. Harmful: danger of serious damage to health by prolonged exposure through inhalation.



Xn; Sensitising

R42/43: May cause sensitisation by inhalation and skin contact.



Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.

(Contd. on page 2)

GB



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

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Version number 1

Revision: 02.04.2014

Trade name: Modralit 3K Hardener

(Contd. of page 1)

- **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

-
- **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**



GHS07 GHS08

- **Signal word** Danger
- **Hazard-determining components of labelling:**
diphenylmethanediisocyanate, isomeres and homologues
diphenylmethane-4,4'-di-isocyanate
diphenylmethane-2,2'-diisocyanate
diphenylmethane-2,4'-diisocyanate
- **Hazard statements**
H332 Harmful if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure.
- **Precautionary statements**
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P285 In case of inadequate ventilation wear respiratory protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment (see on this label).
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Additional information:**
Contains isocyanates. May produce an allergic reaction.
- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3 Composition/information on ingredients

- **3.2 Chemical characterization: Mixtures**
- **Description:** Mixture of substances listed below with nonhazardous additions.

(Contd. on page 3)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: **Modralit 3K Hardener**

(Contd. of page 2)

· Dangerous components:

CAS: 9016-87-9	diphenylmethanediisocyanate, isomeres and homologues ☒ Xn R20-40-48/20; ☒ Xn R42/43; ☒ Xi R36/37/38 Carc. Cat. 3 ⚠ Resp. Sens. 1, H334; ⚠ Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	50-100%
CAS: 101-68-8 EINECS: 202-966-0	diphenylmethane-4,4'-di-isocyanate ☒ Xn R20-40-48/20; ☒ Xn R42/43; ☒ Xi R36/37/38 Carc. Cat. 3 ⚠ Resp. Sens. 1, H334; ⚠ Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	10-25%
CAS: 2536-05-2 EINECS: 219-799-4	diphenylmethane-2,2'-diisocyanate ☒ Xn R20-40-48/20; ☒ Xn R42/43; ☒ Xi R36/37/38 Carc. Cat. 3 ⚠ Resp. Sens. 1, H334; ⚠ Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	2.5-10%
CAS: 5873-54-1 EINECS: 227-534-9	diphenylmethane-2,4'-diisocyanate ☒ Xn R20-40-48/20; ☒ Xn R42/43; ☒ Xi R36/37/38 Carc. Cat. 3 ⚠ Resp. Sens. 1, H334; ⚠ Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; STOT SE 3, H335	2.5-10%

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

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 and to be sure call for a doctor.

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

· After skin contact: Immediately wash with water and soap and rinse thoroughly.

· After eye contact:

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· After swallowing:

Do not induce vomiting.

Call a doctor 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.

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.

· For safety reasons unsuitable extinguishing agents: Water with full jet

· 5.2 Special hazards arising from the substance or mixture

In case of fire, the following can be released:

(Contd. on page 4)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: Modralit 3K Hardener

(Contd. of page 3)

Nitrogen oxides (NO_x)
Carbon monoxide (CO)
Hydrogen cyanide (HCN)
Vapors of Isocyanate

· **5.3 Advice for firefighters**

· **Protective equipment:**

Wear self-contained respiratory protective device.
Mount respiratory protective device.

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**

Ensure adequate ventilation
Keep away from ignition sources.
Do not breathe vapour/spray.

· **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.

· **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.
Ensure adequate ventilation.

· **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.

7 Handling and storage

· **7.1 Precautions for safe handling**

Keep away from heat and direct sunlight.
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 between 15 °C and 30 °C in a dry and well ventilated place. Avoid temperatures exceeding 50 °C or falling below 5 °C.
Protect against sunlight.

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

Do not store together with acids.
Do not store together with alkalis (caustic solutions).
Store away from oxidizing agents.

· **Further information about storage conditions:**

Keep container tightly sealed.
Store in dry conditions.

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

8 Exposure controls/personal protection

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

(Contd. on page 5)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: **Modralit 3K Hardener**

(Contd. of page 4)

· 8.1 Control parameters

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

9016-87-9 diphenylmethanediisocyanate, isomeres and homologues

WEL	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³ Sen; as -NCO
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101-68-8 diphenylmethane-4,4'-di-isocyanate

WEL	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³ Sen; as -NCO
-----	---

2536-05-2 diphenylmethane-2,2'-diisocyanate

WEL	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³ Sen; as -NCO
-----	---

5873-54-1 diphenylmethane-2,4'-diisocyanate

WEL	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³ Sen; as -NCO
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· **Additional information:** The lists valid during the making were used as basis.

· 8.2 Exposure controls

· Personal protective equipment:

· General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

· 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.
Filter A/P2

· Protection of hands:



Protective gloves

Protective gloves should be changed regularly, especially after intensive contact with the product. For every workplace a suitable type of protective gloves must be selected.

· Material of gloves

Nitrile rubber, NBR

As there are many different conditions in every day work these indications can only serve as an aid to orientation for the selection of suitable gloves for the handling of chemical products. By no means they can replace qualifying examinations by the end-user.

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.

(Contd. on page 6)

GB

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: Modralit 3K Hardener

(Contd. of page 5)

The determined penetration times according to EN 374 part III are not performed under practical conditions. Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.

- **Eye protection:**



Tightly sealed goggles

- **Body protection:** Protective work clothing

9 Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form:	Fluid
Colour:	Dark brown
· Odour:	Characteristic
· Odour threshold:	Not determined.

- **pH-value:** Not determined.

- **Change in condition**

Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	> 350 °C

- **Flash point:** 229 °C

- **Flammability (solid, gaseous):** Not applicable.

- **Ignition temperature:** 400 °C

- **Decomposition temperature:** Not determined.

- **Self-igniting:** Product is not selfigniting.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**

Lower:	0.4 Vol %
Upper:	Not determined.

- **Oxidizing properties** Not determined

- **Vapour pressure:** Not determined.

- **Density at 20 °C:** 1.22 g/cm³

- **Relative density** Not determined.

- **Vapour density** Not determined.

- **Evaporation rate** Not determined.

- **Solubility in / Miscibility with water:**

Not miscible or difficult to mix.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**

Dynamic at 20 °C:	145 mPas
Kinematic:	Not determined.

(Contd. on page 7)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: **Modralit 3K Hardener**

(Contd. of page 6)

- **Solvent content:**
- **Organic solvents:** 0.0 %
- **9.2 Other information** No further relevant information available.

10 Stability and reactivity

- **10.1 Reactivity** No dangerous reactions if used according to specifications.
- **10.2 Chemical stability** Stable if used according to specifications.
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions**
Reacts with alcohols, amines, aqueous acids and alkalis.
Reacts with water.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
Carbon monoxide
Nitrogen oxides (NO_x)
Possible in traces.
Hydrogen cyanide (prussic acid)

11 Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity:**
- **LD/LC50 values relevant for classification:**
9016-87-9 Diphenylmethanediisocyanate, Isomeres and Homologues
Oral: LD50: > 15000 mg/kg (rat)
inhalativ: LC50/4h: 0,49 mg/l (rat)
- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:**
Sensitization possible through inhalation.
Sensitization possible through skin contact.
- **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Harmful
Irritant
- **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**
Carc. 2

12 Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.

(Contd. on page 8)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: Modralit 3K Hardener

(Contd. of page 7)

- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**
Disposal must be made according to official regulations.
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Waste disposal key:** 070204
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|---|-----------------|
| <ul style="list-style-type: none"> · 14.1 UN-Number · ADR, ADN, IMDG, IATA | Void |
| <ul style="list-style-type: none"> · 14.2 UN proper shipping name · ADR, ADN, IMDG, IATA | Void |
| <ul style="list-style-type: none"> · 14.3 Transport hazard class(es) · ADR, ADN, IMDG, IATA · Class | Void |
| <ul style="list-style-type: none"> · 14.4 Packing group · ADR, IMDG, IATA | Void |
| <ul style="list-style-type: none"> · 14.5 Environmental hazards: · Marine pollutant: | No |
| <ul style="list-style-type: none"> · 14.6 Special precautions for user | Not applicable. |
| <ul style="list-style-type: none"> · 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| <ul style="list-style-type: none"> · UN "Model Regulation": | - |

GB

(Contd. on page 9)



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

Printing date 02.04.2014

Version number 1

Revision: 02.04.2014

Trade name: **Modralit 3K Hardener**

(Contd. of page 8)

15 Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **National regulations:**
- **Technical instructions (air):**

Class	Share in %
I	50-100

- **Waterhazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.
- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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**

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.

R20 Harmful by inhalation.
 R36/37/38 Irritating to eyes, respiratory system and skin.
 R40 Limited evidence of a carcinogenic effect.
 R42/43 May cause sensitisation by inhalation and skin contact.
 R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

- **Department issuing MSDS:** Department Research & Development

- **Contact:** Dr. Thomas Veit, Lothar Sutor

- **Abbreviations and acronyms:**

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 Harmonized 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)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent