

Date of issue: 31.05.2005

n.ap. = not applicable

n.av. = not available

Version: 0005

KNAUF USG Systems GmbH & Co. KG

1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the substance or preparation

Trade name AQUAPANEL® Joint Adhesive

Recommended use adhesive

Substance code 60013

1.2 Company/undertaking identification

KNAUF USG Systems GmbH & Co. KG

Zur Helle 11

D-58638 Iserlohn

Telephone: int+49-(0)2374-5036-0

Fax: int+49-(0)2374-5036-300

1.3 Emergency telephone number

Giftnotruf Berlin, Beratungsstelle für Vergiftungserscheinungen und Embryonaltoxikologie

Telephone: int+49-(0)30-19240

2. Composition/information on ingredients

This product is a preparation. It is a solution of diphenylmethane-4,4'-di-isocyanate, 2,4'-isomer and 2,2'-isomer and specific components.

2.1 Substances presenting a health / environmental hazard within the meaning of Directive 67/548/EEC

| CAS number | EC number | Identification | m % | Symbols | R-phrases |
|------------|-----------|--------------------------------|-----------|---------|-------------------|
| 101-68-8 | 202-966-0 | diphenylmethane di-isocyanate, | 10 - < 25 | Xn | 20-36/37/38-42/43 |
| 2536-05-2 | 219-799-4 | 4,4'-, 2,2'-, 2,4'-isomers | | | |
| 5873-54-1 | 227-534-9 | | | | |

The product requires a hazard warning label in accordance with EC directives/German regulations on dangerous substances (see point 15.). Full text of the R-phrases see point 16.2.

2.2 Substances subject to recognised exposure limit values pursuant to Community provisions but which are not covered by the Directive 67/548/EEC (see also point 8.)

No substances.

2.3 Additional information

None.

3. Hazards identification

3.1 Hazards identification

Irritant. Sensitising.

3.2 Critical hazards to man

Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.

3.3 Critical hazards to the environment

The product is classified as weakly hazardous to water.

4. First aid measures

4.1 General information

Remove contaminated, soaked clothing immediately and dispose of safely. Poisonous symptoms can first be observed after several hours, therefore medical observation for at least 48 hours is necessary.

4.2 after inhalation

Take affected person to fresh air. When vapours are inhaled, poisonous symptoms can first be observed after several hours, therefore it is essential to consult a doctor.

4.3 after contact with skin

In case of contact with skin wash off immediately with soap and water. Consult a doctor if skin irritation persists.

4.4 after contact with eyes

In case of contact with eyes rinse thoroughly with plenty of water and seek medical advice.

4.5 after ingestion

Do not induce vomiting. Take medical treatment immediately.

4.6 Hints for the physician

Symptoms Asthmatic complaints. Allergic symptoms.

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Hazards Risk of respiratory disorders.
Treatment Treat symptomatically. Medical observation for at least 48 hours is necessary.
Remark Emergency eyewash should be available in vicinity.

5. Fire-fighting measures

5.1 Suitable extinguishing media

Water spray jet, foam, carbon dioxide, dry powder.

5.2 Extinguishing media which must not be used for safety reasons

Full water jet.

5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases

In the event of fire the following can be released: nitrous gases, carbon monoxide, carbon dioxide, isocyanate vapours, traces of hydrogen cyanide.

5.4 Special protective equipment for firefighters

Wear self-contained breathing apparatus. Wear full protective suit.

5.5 Further information

Do not inhale explosion and/or combustion gases. Cool endangered containers with water spray jet. Collect contaminated firefighting water separately, must not be discharged into the drains.

6. Accidental release measures

6.1 Personal precautions

(see also point 8., Personal protective equipment)

Use personal protective clothing. Ensure adequate ventilation.

Use breathing apparatus if exposed to vapours/aerosol. Keep away sources of ignition.

6.2 Environmental precautions

(see also point 13., Disposal considerations)

Do not discharge into the drains/surface waters/groundwater.

6.3 Methods for cleaning up / taking up

Pick up with suitable absorbent material (e.g. sand, sawdust, kieselgur, universal binder). Allow waste material to react for several days. Cover container, but do not close container due to possible evolution of CO₂.

Send in suitable containers for disposal.

6.4 Additional information

None.

7. Handling and storage (National measures see points 15. and 16.)

7.1 Handling

Advice on safe handling

Open and handle container with care. Avoid formation of vapours/aerosols.

Provide good ventilation of working area (local exhaust ventilation if necessary).

Advice on protection against fire and explosion

Keep away sources of ignition.

Additional advice on system design

No additional advice.

7.2 Storage

Requirements for storage rooms and vessels

Keep container tightly closed in a cool, well-ventilated place, open and handle carefully.

Protect container from direct sunlight.

Advice on storage compatibility

Do not store together with explosive matter and oxidising agents.

Further information on storage conditions

Do not keep at temperatures above 50°C and below 0°C.

Storage class (for Germany only)

10 (flammable liquids).

7.3 Specific use(s)

Preclude from exposure and handling this product those persons suffering from an allergy and those persons susceptible to respiratory disease.

8. Exposure controls / personal protection

8.1 Exposure limit values (for Germany only)

| CAS number | Identification | Limit values | Remarks |
|------------|----------------|--------------|---------|
|------------|----------------|--------------|---------|

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| | | | |
|----------|-------------------------------------|--|---|
| 101-68-8 | 4,4'-methylenediphenyl diisocyanate | 0.05 mg/m ³ MAK (total of vapour and aerosols) exceeding factor =1= (see no. 2.3 TRGS 900) 10 µg/g creatinine / BAT (urine) K3 (as respirable aerosols, A-fraction) | DFG; TRGS 900 TRGS 903 TRGS 905 (evaluation AGS) |
|----------|-------------------------------------|--|---|

8.2 Exposure controls (Occupational exposure controls / Environmental exposure controls)

See point 7.

Personal protective equipment

Respiratory protection

In case of spraying, higher concentrations and if ventilation insufficient, use a respiratory protection apparatus with respiration filter.

Hand protection

Protective gloves.

Eye protection

Tightly fitting safety glasses.

Body protection

Work clothing (complete).

General protective measures and hygiene measures

Do not inhale vapours and aerosols. Avoid contact with eyes and skin. Store work clothing separately.

Avoid drying of product on the skin absolutely. Change soiled or soaked clothing immediately.

At work do not eat, drink, smoke or take drugs. Storage of foodstuffs in work rooms is forbidden.

After worktime and before breaks the affected skin areas must be thoroughly cleaned.

After work use barrier skin cream.

9. Physical and chemical properties

9.1 General information

Physical state: pasty

Colour: natural-coloured

Odour: slight, characteristic

9.2 Important health, safety and environmental information

pH (as supplied): n.av.

(of an aqueous solution): n.av.

Melting point / melting range (°C): n.av.

Boiling point / boiling range (°C): > 200

Flash point (°C), c.c.: > 180

Thermal decomposition (°C): > 230

Ignition temperature (°C): 400

Flammability: n.ap.

Autoflammability: n.ap.

Oxidising properties: n.ap.

Lower explosion limit: n.av.

Upper explosion limit: n.av.

Vapour pressure (50°C) (mbar): 1000

Density (30°C) (g/cm³): approx. 1.5

Solubility in water (at 20°C): slightly soluble

Soluble in: n.av.

Viscosity: n.ap.

Solvent separation test: n.ap.

9.3 Other information

None.

10. Stability and reactivity

10.1 Conditions to avoid / materials to avoid

Thermal decomposition at temperatures above 230°C. Containers are liable to burst if temperature rises.

Under normal conditions 4,4'-methylenediphenyl diisocyanate reacts slowly with water, with evolution of carbon dioxide (formation of excessive pressure in sealed containers).

Exothermic reaction with amines and alcohols.

10.2 Hazardous decomposition products

Hazardous decomposition: nitrous gases, carbon dioxide.

In the event of fire isocyanate vapours and traces of hydrogen cyanide as well.

10.3 Additional information

None.

11. Toxicological information

11.1 Toxicological examination

11.1.1 Acute oral toxicity / acute dermal toxicity / acute inhalation toxicity

LD50 rat, oral

(mg/kg)

n.av.

| | | |
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- | | | |
|----------------------|-----------|-------|
| LD50 rat, dermal | (mg/kg) | n.av. |
| LC50 rat, inhalation | (mg/l/4h) | n.av. |
- 11.1.2 Irritant effect**
- | | |
|-------------------------|-------|
| Irritant effect on skin | n.av. |
| Irritant effect on eyes | n.av. |
| Sensitisation | n.av. |
- 11.1.3 Subacute toxicity / Sub-chronic toxicity / Chronic toxicity / Mutagenicity / Teratogenicity / Carcinogenicity**
- | | |
|------------------|----------------|
| Carcinogenicity: | n.av. |
| Mutagenicity: | n.av. |
| Teratogenicity: | n.av. |
| Chronic effect: | see point 11.2 |
- 11.1.4 Further information**
- No toxicological data available.
- 11.2 Experiences made in practice**
- Irritating to eyes, respiratory system and skin. May cause sensitisation by inhalation and skin contact.
 Very low concentrations of 4,4'-methylenediphenyl diisocyanate may cause allergic reactions in sensitive persons.
 Those persons may not have any further contact with this substance. Complaints can first be observed after several hours or days (bronchial asthma due to vapours of 4,4'-methylenediphenyl diisocyanate and allergic symptoms).
 Respirable aerosols of 4,4'-methylenediphenyl diisocyanate are suspected to cause cancer in accordance with TRGS 905 (category K3).
- 11.3 General remarks**
- The product has not been tested.
 The product was classified on the basis of the calculation procedure of the preparation directive 1999/45/EC.
 Labelling on the basis of the component diphenylmethane di-isocyanate (4,4'-, 2,2'-, 2,4'-isomers).

12. Ecological information

12.1 Ecotoxicity

Aquatic toxicity

| | | |
|------|-----------|-------|
| LC50 | (fish) | n.av. |
| EC50 | (daphnia) | n.av. |
| IC50 | (algae) | n.av. |

Behaviour in sewage works:

The behaviour of the product in sewage treatment plants has not been tested.

12.2 Mobility

The product has not been tested.

12.3 Data on elimination (persistence and degradability)

Under normal conditions 4,4'-methylenediphenyl diisocyanate reacts slowly with water, with evolution of carbon dioxide and formation of solid polyurea (insoluble, not biodegradable and not acute toxic).

12.4 Bioaccumulative potential

The product has not been tested.

12.5 Other adverse effects

| | |
|--|---------------|
| Ozone depletion potential | n.av. |
| Photochemical ozone creation potential | n.av. |
| AOX-hint | Not to apply. |

12.6 Further information

| | |
|----------------------------------|-------|
| Chemical oxygen demand (COD) | n.av. |
| Biochemical oxygen demand (BOD5) | n.av. |

Product reacts with water, with evolution of carbon dioxide.

The product is classified as weakly hazardous to water.

Contains according to the formulation following heavy metals and compounds of EC-Directives 76/464/EEC and 80/68/EEC:

None.

13. Disposal considerations

13.1 Product / unused product

Waste disposal corresponding to European Waste Catalogue.
 Wastes must be classified with respect to their origin and depending on specific processing steps. The waste codes mentioned as follows are only constituted as our recommendations. Referring to the particular case they

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| | |
|------------------------------------|---|
| Waste type | should be completed or revised. |
| Waste notation | Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks |
| EC waste code | Wastes from MFSU of adhesives and sealants (including waterproofing products) |
| Disposal operations | 08 04 09 waste adhesives and sealants containing organic solvents or other dangerous substances |
| Recovery operations | D 10 Incineration on land |
| 13.2 Contaminated packaging | R 1 Use principally as a fuel or other means to generate energy |
| Recommendation | Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse. |
| Recommended cleansing agent | Packaging that cannot be cleaned should be disposed off as product waste. n.av. |

14. Transport information**14.1 Land transport ADR / RID / GGVSE**

No dangerous good in accordance with the regulations.

14.2 Marine transport IMDG-Code / GGVSee

No dangerous good in accordance with the regulations.

14.3 Air transport ICAO / IATA-DGR

No dangerous good in accordance with the regulation.

15. Regulatory information**15.1 Labelling in accordance with Directive EC**

Symbol(s) of danger:

Xn

Indication(s) of danger:

Harmful

Hazardous component(s) to be indicated on label:

diphenylmethane di-isocyanate,
(4,4'-, 2,2'-, 2,4'-isomers)R-phrases: R36/37/38
R42/43Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contactS-phrases: S1/2
S23
S36/37
S45Keep locked up and out of the reach of children.
Do not breathe vapour.
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately
(show the label where possible).**Special labelling for certain preparations:**

Contains isocyanates.

See information supplied by the manufacturer.

Remarks:

According to Article 9 paragraph 1.3 in connection with Annex IV of Directive 1999/45/EC containers containing this preparation and offered or sold to the general public carry a tactile warning of danger.

According to Article 9 paragraph 1.2 of Directive 1999/45/EC containers do not have either a shape and/or graphic decoration likely to attract or arouse the active curiosity of children or to mislead consumers.

15.2 National measures (for Germany only)

Restriction of occupation:

Law for the protection of expectant and nursing mothers;
Youth Employment Protection Act must be observed.

Major-accident Regulation:

n.ap.

Fire and explosion hazards:

n.ap.

Regulation on clean air (TA Luft):

point 5.2.5, class I, diphenylmethane di-isocyanate (2,4'- and

| | | |
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| | |
|---|---|
| Water hazard class: | 4,4'-isomers), 10 - < 25% 1 (calculation according to KBwS) The Federal State Enactment for Facilities to Handle Water Endangering Substances (German VAwS–Anlagen-Verord- nung) has to be observed |
| German Ordinance on Hazardous Substances (in accordance with EC-Directive 98/24/EC): | Articles 7, 8, 9, 14, 15, 16, Annex V No 2 |

16. Other information**16.1 Keeping (restrictions)**

Article 8 (6) and (7) of the German Ordinance on
Hazardous Substances has to be observed (only for Germany)
For industry consumer, for the general public

Distribution**Indication of the manufacturer: recommended use/restrictions of use**

Preclude from exposure and handling this product those persons suffering from an allergy and those persons
susceptible to respiratory disease.

16.2 Full text of the R-phrases (diphenylmethane di-isocyanate, 4,4'-, 2,2'-, 2,4'-isomers)

R20: Harmful by inhalation.
R36/37/38: Irritating to eyes, respiratory system and skin.
R42/43: May cause sensitisation by inhalation and skin contact.

16.3 Technical contact point

KNAUF USG Systems GmbH & Co. KG, Zur Helle 11, D-58638 Iserlohn
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Version 0005: replacement of version 0004 dated 28.05.2004

Revised sections: 15.1, 15.2, 16.1

16.4 This information is based on our present state of knowledge.

It should not therefore be construed as guaranteeing specific properties of the products as described or their
suitability for a particular application.