



DRIVING SURFACE PERFECTION

STRONGHOLD 915 TPO ADHESIVE HARDENER

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
 SDS Ref. (EU): SRB-TPO-SDS
 Issue date: 13/04/2015 Revision date: 04/12/2020 Supersedes version of: 13/08/2020 Version: 4.0

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

1.1. Product identifier

Product form : Mixture
 Trade name : STRONGHOLD 915 TPO ADHESIVE HARDENER
 UFI : 4NY0-1037-600H-7Q9R
 Product code : SH9151, SH9152
 Product group : Adhesives, sealants

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Industrial use, Professional use
 Use of the substance/mixture : Adhesives, sealants
 Function or use category : bonding agent

1.2.2. Uses advised against

Restrictions on use : Consumer uses: Private households (= general public = consumers)

1.3. Details of the supplier of the safety data sheet

Manufacturer

U-POL Limited
 Denington Road
 NN8 2QH Wellingborough - United Kingdom
 T +44 (0) 1933 230310
technicalsupport@u-pol.com - www.u-pol.com

Importer

U-POL Netherlands B.V.
 Hoogoorddreef 15
 1101BA Amsterdam - Netherlands
 T +31 20 240 2216
technicalsupport@u-pol.com - www.u-pol.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: +44 (0) 870 8200418 (24 hrs)

| Country | Organisation/Company | Address | Emergency number | Comment |
|----------------|--|--|--|---|
| Ireland | National Poisons Information Centre Beaumont Hospital | PO Box 1297 Beaumont Road 9 Dublin | +353 1 809 2566 (Healthcare professionals- 24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7) | |
| United Kingdom | NHS England, Scotland & Wales | - | Call 111 or a Doctor | In Northern Ireland, contact your local GP or pharmacist during normal hours (www.gpoutofhours.hscni.net) |

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute toxicity (inhalation:dust,mist) Category 4 H332
 Skin corrosion/irritation, Category 2 H315
 Serious eye damage/eye irritation, Category 2 H319
 Respiratory sensitisation, Category 1 H334
 Skin sensitisation, Category 1 H317
 Carcinogenicity, Category 2 H351

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Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation H335

Specific target organ toxicity — Repeated exposure, Category 2 H373

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure. Harmful if inhaled. May cause respiratory irritation. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Contains

: formaldehyde, homopolymer with aniline and carbonyl dichloride; aromatic polyisocyanate; 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate; o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate; 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate

Hazard statements (CLP)

: 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.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs (hearing organs) through prolonged or repeated exposure (inhalation).

Precautionary statements (CLP)

: P261 - Avoid breathing vapours, fume.
P264 - Wash hands thoroughly after handling.
P280 - Wear eye protection, protective clothing, protective gloves.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a doctor.
P362+P364 - Take off contaminated clothing and wash it before reuse.

EUH-statements

: EUH204 - Contains isocyanates. May produce an allergic reaction.

Extra phrases

: As from 24 August 2023 adequate training is required before industrial or professional use.

2.3. Other hazards

| Component | |
|---|---|
| polymethylene polyphenyl isocyanate (9016-87-9) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |

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| | |
|---|---|
| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
|---|---|

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|---|---|---------|---|
| aromatic polyisocyanate | (CAS-No.) 67815-87-6 (EC-No.) 642-899-8 | 25 – 50 | Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 STOT SE 3, H335 STOT RE 2, H373 |
| polymethylene polyphenyl isocyanate | (CAS-No.) 9016-87-9 (EC Index-No.) 615-005-00-9 | 25 – 50 | Acute Tox. 4 (Inhalation:dust,mist), 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 |
| formaldehyde, homopolymer with aniline and carbonyl dichloride | (CAS-No.) 32055-14-4 (EC-No.) 500-079-6 (REACH-no) 01-2119457024-46 | 20 – 25 | Skin Irrit. 2, H315 Eye Irrit. 2, H319 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373 |
| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (Note 2) | (CAS-No.) 101-68-8 (EC-No.) 202-966-0 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119457014-47 | 3 – 5 | Acute Tox. 4 (Inhalation), 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 |
| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (Note C)(Note 2) | (CAS-No.) 5873-54-1 (EC-No.) 227-534-9 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119480143-45 | 3 – 5 | Acute Tox. 4 (Inhalation), 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 |

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| | | | |
|---|---|-------|--|
| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (Note C)(Note 2) | (CAS-No.) 2536-05-2 (EC-No.) 219-799-4 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119927323-43 | < 0.1 | Acute Tox. 4 (Inhalation), 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 |
|---|---|-------|--|

Specific concentration limits:

| Name | Product identifier | Specific concentration limits |
|---|---|---|
| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate | (CAS-No.) 101-68-8 (EC-No.) 202-966-0 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119457014-47 | (0.1 ≤C < 100) Resp. Sens. 1, H334 (5 ≤C < 100) Eye Irrit. 2, H319 (5 ≤C < 100) Skin Irrit. 2, H315 (5 ≤C < 100) STOT SE 3, H335 |
| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate | (CAS-No.) 5873-54-1 (EC-No.) 227-534-9 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119480143-45 | (0.1 ≤C < 100) Resp. Sens. 1, H334 (5 ≤C < 100) Skin Irrit. 2, H315 (5 ≤C < 100) Eye Irrit. 2, H319 (5 ≤C < 100) STOT SE 3, H335 |
| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate | (CAS-No.) 2536-05-2 (EC-No.) 219-799-4 (EC Index-No.) 615-005-00-9 (REACH-no) 01-2119927323-43 | (0.1 ≤C < 100) Resp. Sens. 1, H334 (5 ≤C < 100) Skin Irrit. 2, H315 (5 ≤C < 100) Eye Irrit. 2, H319 (5 ≤C < 100) STOT SE 3, H335 |

Note 2 : The concentration of isocyanate stated is the percentage by weight of the free monomer calculated with reference to the total weight of the mixture.

Note C : Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers.

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

| | |
|---------------------------------------|--|
| First-aid measures general | : IF exposed or concerned: Get medical advice/attention. Call a poison center or a doctor if you feel unwell. |
| First-aid measures after inhalation | : Remove person to fresh air and keep comfortable for breathing. Call a poison center or a doctor if you feel unwell. |
| First-aid measures after skin contact | : Wash skin with plenty of water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention. |
| First-aid measures after eye contact | : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. |
| First-aid measures after ingestion | : Call a poison center or a doctor if you feel unwell. |

4.2. Most important symptoms and effects, both acute and delayed

| | |
|-------------------------------------|--|
| Symptoms/effects after inhalation | : May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Symptoms/effects after skin contact | : Irritation. May cause an allergic skin reaction. |
| Symptoms/effects after eye contact | : Eye irritation. |

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Safety glasses. Protective clothing. Gloves.
Emergency procedures : Ventilate spillage area. Do not breathe vapours, fume. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain released product, pump into suitable containers. Collect spillage.
Methods for cleaning up : Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Do not breathe vapours, fume. Use only outdoors or in a well-ventilated area. Avoid contact with skin and eyes.
Hygiene measures : Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool.
Storage temperature : < 25 °C
Storage area : Store in a well-ventilated place.
Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | |
|--|--|
| Ireland - Occupational Exposure Limits | |
| Local name | 4,4'-Methylene-diphenyl diisocyanate (as —NCO) [MDI] |
| OEL TWA [2] | 0.005 ppm |
| Notes (IE) | Sens. (In the workplace respiratory or dermal exposures to sensitising agents may occur. Sensitizers may evoke respiratory or dermal reactions, e.g. asthma, rhinitis and allergic contact dermatitis. The notation does not distinguish between respiratory or dermal sensitisation. Chemical agents that are sensitizers present special problems in the workplace. Should an employee become sensitised, subsequent exposure may cause intense responses, even at low exposure concentrations well below the OELV. Exposure should be eliminated or significantly reduced through control measures such as engineering and process controls and use of personal protective equipment (PPE)) |
| Regulatory reference | Chemical Agents Code of Practice 2020 |
| United Kingdom - Occupational Exposure Limits | |
| WEL TWA (OEL TWA) [1] | 0.02 mg/m ³ |
| WEL STEL (OEL STEL) | 0.07 mg/m ³ |

| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | |
|---|------------------------|
| United Kingdom - Occupational Exposure Limits | |
| WEL TWA (OEL TWA) [1] | 0.02 mg/m ³ |
| WEL STEL (OEL STEL) | 0.07 mg/m ³ |

| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | |
|---|------------------------|
| United Kingdom - Occupational Exposure Limits | |
| WEL TWA (OEL TWA) [1] | 0.02 mg/m ³ |
| WEL STEL (OEL STEL) | 0.07 mg/m ³ |

| polymethylene polyphenyl isocyanate (9016-87-9) | |
|--|------------------------|
| United Kingdom - Occupational Exposure Limits | |
| WEL TWA (OEL TWA) [1] | 0.02 mg/m ³ |
| WEL STEL (OEL STEL) | 0.07 mg/m ³ |

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | |
|--|------------------------|
| DNEL/DMEL (Workers) | |
| Acute - local effects, inhalation | 0.1 mg/m ³ |
| Long-term - local effects, inhalation | 0.05 mg/m ³ |

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| DNEL/DMEL (General population) | |
|---------------------------------------|-------------------------|
| Acute - systemic effects, inhalation | 0.05 mg/m ³ |
| Long-term - local effects, inhalation | 0.025 mg/m ³ |
| PNEC (Water) | |
| PNEC aqua (freshwater) | 1 mg/l |
| PNEC aqua (marine water) | 0.1 mg/l |
| PNEC (Soil) | |
| PNEC soil | 1 mg/kg dwt |
| PNEC (STP) | |
| PNEC sewage treatment plant | 1 mg/l |

| formaldehyde, homopolymer with aniline and carbonyl dichloride (32055-14-4) | |
|--|------------------------|
| DNEL/DMEL (Workers) | |
| Long-term - local effects, inhalation | 0.05 mg/m ³ |

| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | |
|---|-------------------------|
| DNEL/DMEL (Workers) | |
| Acute - systemic effects, dermal | 50 mg/kg bodyweight/day |
| Acute - systemic effects, inhalation | 0.1 mg/m ³ |
| Acute - local effects, dermal | 28.7 mg/cm ² |
| Acute - local effects, inhalation | 0.1 mg/m ³ |
| Long-term - systemic effects, inhalation | 0.05 mg/m ³ |
| Long-term - local effects, inhalation | 0.05 mg/m ³ |
| DNEL/DMEL (General population) | |
| Acute - systemic effects, dermal | 25 mg/kg bodyweight/day |
| Acute - systemic effects, inhalation | 0.05 mg/m ³ |
| Acute - systemic effects, oral | 20 mg/kg bodyweight/day |
| Acute - local effects, dermal | 17.2 mg/cm ² |
| Acute - local effects, inhalation | 0.05 mg/m ³ |
| Long-term - systemic effects, inhalation | 0.025 mg/m ³ |
| Long-term - local effects, inhalation | 0.025 mg/m ³ |
| PNEC (Water) | |
| PNEC aqua (freshwater) | 1 mg/l |
| PNEC aqua (marine water) | 0.1 mg/l |
| PNEC aqua (intermittent, freshwater) | 10 mg/l |
| PNEC (Soil) | |
| PNEC soil | 1 mg/kg dwt |
| PNEC (STP) | |
| PNEC sewage treatment plant | 1 mg/l |

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| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | |
|---|-------------------------|
| DNEL/DMEL (Workers) | |
| Acute - systemic effects, dermal | 50 mg/kg bodyweight/day |
| Acute - systemic effects, inhalation | 0.1 mg/m ³ |
| Acute - local effects, dermal | 28.7 mg/cm ² |
| Acute - local effects, inhalation | 0.1 mg/m ³ |
| Long-term - systemic effects, inhalation | 0.05 mg/m ³ |
| Long-term - local effects, inhalation | 0.05 mg/m ³ |
| DNEL/DMEL (General population) | |
| Acute - systemic effects, dermal | 25 mg/kg bodyweight/day |
| Acute - systemic effects, inhalation | 0.05 mg/m ³ |
| Acute - systemic effects, oral | 20 mg/kg bodyweight/day |
| Acute - local effects, dermal | 17.2 mg/cm ² |
| Acute - local effects, inhalation | 0.05 mg/m ³ |
| Long-term - systemic effects, inhalation | 0.025 mg/m ³ |
| Long-term - local effects, inhalation | 0.025 mg/m ³ |
| PNEC (Water) | |
| PNEC aqua (freshwater) | 1 mg/l |
| PNEC aqua (marine water) | 0.1 mg/l |
| PNEC aqua (intermittent, freshwater) | 10 mg/l |
| PNEC (Soil) | |
| PNEC soil | 1 mg/kg dwt |
| PNEC (STP) | |
| PNEC sewage treatment plant | 1 mg/l |

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:

Ensure good ventilation of the work station.

8.2.2. Personal protection equipment

Personal protective equipment symbol(s):



8.2.2.1. Eye and face protection

Eye protection:

Safety glasses

8.2.2.2. Skin protection

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Skin and body protection:

Wear suitable protective clothing

Hand protection:

Protective gloves

Other skin protection

Materials for protective clothing:

Impermeable clothing

8.2.2.3. Respiratory protection

Respiratory protection:

[In case of inadequate ventilation] wear respiratory protection.

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|---|------------------|
| Physical state | : Liquid |
| Colour | : Yellow. brown. |
| Appearance | : Liquid. |
| Odour | : aromatic. |
| Odour threshold | : Not available |
| Melting point | : Not available |
| Freezing point | : Not available |
| Boiling point | : Not available |
| Flammability | : Not applicable |
| Explosive limits | : Not available |
| Lower explosive limit (LEL) | : Not available |
| Upper explosive limit (UEL) | : Not available |
| Flash point | : > 100 °C |
| Auto-ignition temperature | : Not available |
| Decomposition temperature | : Not available |
| pH | : Not available |
| Viscosity, kinematic | : Not available |
| Solubility | : Not available |
| Partition coefficient n-octanol/water (Log Kow) | : Not available |
| Vapour pressure | : Not available |
| Vapour pressure at 50 °C | : Not available |
| Density | : Not available |
| Relative density | : Not available |
| Relative vapour density at 20 °C | : Not available |
| Particle size | : Not applicable |
| Particle size distribution | : Not applicable |
| Particle shape | : Not applicable |
| Particle aspect ratio | : Not applicable |
| Particle aggregation state | : Not applicable |
| Particle agglomeration state | : Not applicable |
| Particle specific surface area | : Not applicable |

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Particle dustiness : Not applicable

9.2. Other information

VOC content : 0 g/l

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

VOC content : 0 g/l

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Harmful if inhaled.

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| | |
|---------------------|--------------|
| ATE CLP (dust,mist) | 2.18 mg/l/4h |
|---------------------|--------------|

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

| | |
|-----------------------------------|---|
| LD50 oral rat | > 7616 mg/kg (Equivalent or similar to OECD 401, Rat, Female, Read-across, Oral) |
| LD50 dermal rabbit | > 9400 mg/kg bodyweight (Equivalent or similar to OECD 402, 24 h, Rabbit, Male / female, Read-across, Dermal) |
| LC50 Inhalation - Rat (Dust/Mist) | 1.5 mg/l/4h |

2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2)

| | |
|--------------------|--|
| LD50 oral rat | > 2000 mg/kg bodyweight Animal: rat, Guideline: other:84/449/EEC (Gazette of the European Community, No. L 251, of 19 Sept, 1984, page 96) |
| LD50 dermal rabbit | > 9400 mg/kg bodyweight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity) |

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| | |
|-----------------------------------|-------------|
| LC50 Inhalation - Rat (Dust/Mist) | 1.5 mg/l/4h |
|-----------------------------------|-------------|

o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1)

| | |
|-----------------------------------|--|
| LD50 oral rat | > 2000 mg/kg bodyweight Animal: rat, Guideline: other:84/449/EEC (Gazette of the European Community, No. L 251, of 19 Sept, 1984, page 96) |
| LD50 dermal rabbit | > 9400 mg/kg bodyweight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity) |
| LC50 Inhalation - Rat (Dust/Mist) | 1.5 mg/l/4h |

polymethylene polyphenyl isocyanate (9016-87-9)

| | |
|-----------------------------------|---|
| LD50 oral rat | > 10000 mg/kg (Rat, Literature study, Oral) |
| LD50 dermal rabbit | > 5000 mg/kg (Rabbit, Literature study, Dermal) |
| LC50 Inhalation - Rat (Dust/Mist) | 1.5 mg/l/4h |

| | |
|-----------------------------------|---|
| Skin corrosion/irritation | : Causes skin irritation. |
| Serious eye damage/irritation | : Causes serious eye irritation. |
| Respiratory or skin sensitisation | : May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. |
| Germ cell mutagenicity | : Not classified |
| Carcinogenicity | : Suspected of causing cancer. |

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

| | |
|------------|----------------------|
| IARC group | 3 - Not classifiable |
|------------|----------------------|

polymethylene polyphenyl isocyanate (9016-87-9)

| | |
|------------|----------------------|
| IARC group | 3 - Not classifiable |
|------------|----------------------|

| | |
|-----------------------|-------------------------------------|
| Reproductive toxicity | : Not classified |
| STOT-single exposure | : May cause respiratory irritation. |

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

aromatic polyisocyanate (67815-87-6)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

formaldehyde, homopolymer with aniline and carbonyl dichloride (32055-14-4)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

polymethylene polyphenyl isocyanate (9016-87-9)

| | |
|----------------------|-----------------------------------|
| STOT-single exposure | May cause respiratory irritation. |
|----------------------|-----------------------------------|

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STOT-repeated exposure : May cause damage to organs (hearing organs) through prolonged or repeated exposure (inhalation).

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

STOT-repeated exposure May cause damage to organs (lungs) through prolonged or repeated exposure (if inhaled).

aromatic polyisocyanate (67815-87-6)

STOT-repeated exposure May cause damage to organs through prolonged or repeated exposure.

formaldehyde, homopolymer with aniline and carbonyl dichloride (32055-14-4)

STOT-repeated exposure May cause damage to organs through prolonged or repeated exposure.

2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2)

STOT-repeated exposure May cause damage to organs through prolonged or repeated exposure.

o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1)

STOT-repeated exposure May cause damage to organs through prolonged or repeated exposure (if inhaled).

polymethylene polyphenyl isocyanate (9016-87-9)

STOT-repeated exposure May cause damage to organs through prolonged or repeated exposure (if inhaled).

Aspiration hazard : Not classified

11.2. Information on other hazards

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Not classified

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

| | |
|----------------------|--|
| LC50 - Fish [1] | > 1000 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Danio rerio, Static system, Fresh water, Read-across, Nominal concentration) |
| EC50 - Crustacea [1] | 129.7 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 24 h, Daphnia magna, Static system, Fresh water, Read-across, Locomotor effect) |
| EC50 72h - Algae [1] | > 1640 mg/l (OECD 201: Alga, Growth Inhibition Test, Desmodesmus subspicatus, Static system, Fresh water, Read-across, Growth rate) |

2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2)

| | |
|----------------------|--|
| LC50 - Fish [1] | > 1000 mg/l Test organisms (species): Danio rerio (previous name: Brachydanio rerio) |
| EC50 - Crustacea [1] | > 1000 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 24 h, Daphnia magna, Static system, Fresh water, Read-across, GLP) |

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| | |
|----------------------|---|
| EC50 72h - Algae [1] | > 1640 mg/l (OECD 201: Alga, Growth Inhibition Test, <i>Desmodesmus subspicatus</i> , Static system, Fresh water, Read-across, GLP) |
| NOEC (chronic) | ≥ 10 mg/l Test organisms (species): <i>Daphnia magna</i> Duration: '21 d' |

| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | |
|---|---|
| LC50 - Fish [1] | > 1000 mg/l Test organisms (species): <i>Danio rerio</i> (previous name: <i>Brachydanio rerio</i>) |
| EC50 - Crustacea [1] | > 1000 mg/l (OECD 202: <i>Daphnia</i> sp. Acute Immobilisation Test, 24 h, <i>Daphnia magna</i> , Static system, Fresh water, Read-across, Nominal concentration) |
| ErC50 algae | > 1640 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, <i>Desmodesmus subspicatus</i> , Static system, Fresh water, Read-across, GLP) |
| NOEC (chronic) | ≥ 10 mg/l Test organisms (species): <i>Daphnia magna</i> Duration: '21 d' |

| polymethylene polyphenyl isocyanate (9016-87-9) | |
|--|--------------------------------------|
| LC50 - Other aquatic organisms [1] | > 1000 mg/l (96 h, Literature study) |

12.2. Persistence and degradability

| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | |
|--|-------------------------------------|
| Persistence and degradability | Not readily biodegradable in water. |

| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | |
|---|-------------------------------------|
| Persistence and degradability | Not readily biodegradable in water. |

| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | |
|---|-------------------------------------|
| Persistence and degradability | Not readily biodegradable in water. |

| polymethylene polyphenyl isocyanate (9016-87-9) | |
|--|-------------------------------------|
| Persistence and degradability | Not readily biodegradable in water. |

12.3. Bioaccumulative potential

| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | |
|--|--|
| BCF - Fish [1] | 92 – 200 (OECD 305: Bioconcentration: Flow-Through Fish Test, 4 week(s), <i>Cyprinus carpio</i> , Flow-through system, Fresh water, Experimental value, GLP) |
| Partition coefficient n-octanol/water (Log Pow) | 4.51 (Experimental value, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 22 °C) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |

| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | |
|---|---|
| BCF - Fish [1] | 92 – 200 (OECD 305: Bioconcentration: Flow-Through Fish Test, 28 day(s), <i>Cyprinus carpio</i> , Flow-through system, Fresh water, Read-across, GLP) |
| Partition coefficient n-octanol/water (Log Pow) | 5.22 (QSAR, KOWWIN) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |

| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | |
|---|---|
| BCF - Fish [1] | 92 – 200 (OECD 305: Bioconcentration: Flow-Through Fish Test, 28 day(s), <i>Cyprinus carpio</i> , Flow-through system, Fresh water, Read-across, GLP) |

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| | |
|---|---|
| Partition coefficient n-octanol/water (Log Pow) | 4.51 (Read-across, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 22 °C) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |

polymethylene polyphenyl isocyanate (9016-87-9)

| | |
|---|--|
| BCF - Fish [1] | 1 (Pisces, Literature study) |
| Partition coefficient n-octanol/water (Log Pow) | 10.46 (Calculated, KOWWIN) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |

12.4. Mobility in soil

4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8)

| | |
|-----------------|---|
| Surface tension | Data waiving |
| Ecology - soil | No (test)data on mobility of the substance available. |

2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2)

| | |
|----------------|---|
| Ecology - soil | No (test)data on mobility of the substance available. |
|----------------|---|

o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1)

| | |
|----------------|---|
| Ecology - soil | No (test)data on mobility of the substance available. |
|----------------|---|

polymethylene polyphenyl isocyanate (9016-87-9)

| | |
|---|---|
| Partition coefficient n-octanol/water (Log Koc) | 9.078 – 10.597 (log Koc, SRC PCKOCWIN v2.0, Calculated value) |
| Ecology - soil | Adsorbs into the soil. |

12.5. Results of PBT and vPvB assessment

Component

| | |
|---|---|
| polymethylene polyphenyl isocyanate (9016-87-9) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
| 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate (101-68-8) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
| o-(p-isocyanatobenzyl)phenyl isocyanate; diphenylmethane-2,4'-diisocyanate (5873-54-1) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |
| 2,2'-methylenediphenyl diisocyanate; diphenylmethane-2,2'-diisocyanate (2536-05-2) | This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII |

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|------------------------------|---|
| Regional legislation (waste) | : Disposal must be done according to official regulations. |
| Waste treatment methods | : Dispose of contents/container in accordance with licensed collector's sorting instructions. |

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SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

14.1. UN number or ID number

| | |
|---------------|-----------------|
| UN-No. (ADR) | : Not regulated |
| UN-No. (IMDG) | : Not regulated |
| UN-No. (IATA) | : Not regulated |
| UN-No. (ADN) | : Not regulated |
| UN-No. (RID) | : Not regulated |

14.2. UN proper shipping name

| | |
|-----------------------------|-----------------|
| Proper Shipping Name (ADR) | : Not regulated |
| Proper Shipping Name (IMDG) | : Not regulated |
| Proper Shipping Name (IATA) | : Not regulated |
| Proper Shipping Name (ADN) | : Not regulated |
| Proper Shipping Name (RID) | : Not regulated |

14.3. Transport hazard class(es)

| | |
|-----------------------------------|-----------------|
| ADR | |
| Transport hazard class(es) (ADR) | : Not regulated |
| IMDG | |
| Transport hazard class(es) (IMDG) | : Not regulated |
| IATA | |
| Transport hazard class(es) (IATA) | : Not regulated |
| ADN | |
| Transport hazard class(es) (ADN) | : Not regulated |
| RID | |
| Transport hazard class(es) (RID) | : Not regulated |

14.4. Packing group

| | |
|----------------------|-----------------|
| Packing group (ADR) | : Not regulated |
| Packing group (IMDG) | : Not regulated |
| Packing group (IATA) | : Not regulated |
| Packing group (ADN) | : Not regulated |
| Packing group (RID) | : Not regulated |

14.5. Environmental hazards

| | |
|-------------------------------|--|
| Dangerous for the environment | : No |
| Marine pollutant | : No |
| Other information | : No supplementary information available |

14.6. Special precautions for user

Overland transport

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

Inland waterway transport

Not regulated

Rail transport

Not regulated

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14.7. Maritime transport in bulk according to IMO instruments

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

| Reference code | Applicable on | Entry title or description |
|----------------|--|---|
| 3(b) | STRONGHOLD 915 TPO ADHESIVE HARDENER ; formaldehyde, homopolymer with aniline and carbonyl dichloride ; aromatic polyisocyanate | Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10 |
| 56. | 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate ; 1,1'-methylene-bis(2-isocyanatobenzene) ; diphenylmethane-2,4'-diisocyanate | Methylenediphenyl diisocyanate (MDI) |
| 56(a) | 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate | Methylenediphenyl diisocyanate (MDI) isomers: 4,4'-Methylenediphenyl diisocyanate |
| 56(b) | diphenylmethane-2,4'-diisocyanate | Methylenediphenyl diisocyanate (MDI) isomers: 2,4'-Methylenediphenyl diisocyanate |
| 56(c) | 1,1'-methylene-bis(2-isocyanatobenzene) | Methylenediphenyl diisocyanate (MDI) isomers: 2,2'-Methylenediphenyl diisocyanate |
| 74. | 4,4'-methylenediphenyl diisocyanate; diphenylmethane-4,4'-diisocyanate ; diphenylmethane-2,4'-diisocyanate | Diisocyanates, $O = C = N - R - N = C = O$, with R an aliphatic or aromatic hydrocarbon unit of unspecified length |

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

VOC content : 0 g/l

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Abbreviations and acronyms:

| | |
|---------|---|
| ADN | European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways |
| ADR | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| ATE | Acute Toxicity Estimate |
| BLV | Biological limit value |
| CAS-No. | Chemical Abstract Service number |

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| | |
|--------|---|
| CLP | Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 |
| DMEL | Derived Minimal Effect level |
| DNEL | Derived-No Effect Level |
| EC50 | Median effective concentration |
| EC-No. | European Community number |
| EN | European Standard |
| IATA | International Air Transport Association |
| IMDG | International Maritime Dangerous Goods |
| LC50 | Median lethal concentration |
| LD50 | Median lethal dose |
| LOAEL | Lowest Observed Adverse Effect Level |
| NOAEC | No-Observed Adverse Effect Concentration |
| NOAEL | No-Observed Adverse Effect Level |
| NOEC | No-Observed Effect Concentration |
| OEL | Occupational Exposure Limit |
| PBT | Persistent Bioaccumulative Toxic |
| PNEC | Predicted No-Effect Concentration |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 |
| RID | Regulations concerning the International Carriage of Dangerous Goods by Rail |
| SDS | Safety Data Sheet |
| vPvB | Very Persistent and Very Bioaccumulative |
| WGK | Water Hazard Class |

| Full text of H- and EUH-statements: | |
|-------------------------------------|--|
| Acute Tox. 4 (Inhalation) | Acute toxicity (inhal.), Category 4 |
| Acute Tox. 4 (Inhalation:dust,mist) | Acute toxicity (inhalation:dust,mist) Category 4 |
| Carc. 2 | Carcinogenicity, Category 2 |
| Eye Irrit. 2 | Serious eye damage/eye irritation, Category 2 |
| Resp. Sens. 1 | Respiratory sensitisation, Category 1 |
| Skin Irrit. 2 | Skin corrosion/irritation, Category 2 |
| Skin Sens. 1 | Skin sensitisation, Category 1 |
| STOT RE 2 | Specific target organ toxicity — Repeated exposure, Category 2 |
| STOT SE 3 | Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation |
| 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. |
| H351 | Suspected of causing cancer. |

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| | |
|--------|--|
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| EUH204 | Contains isocyanates. May produce an allergic reaction. |

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The information contained within this Safety Data Sheet (SDS) is believed to be correct as of the date issued however it is subject to change from time to time. It does not purport to be all inclusive or exhaustive and shall only be used as a guide. U-POL makes no warranties, expressed or implied, including but not limited to, any implied warranty of fitness for a given purpose or usage. It is the Buyers responsibility to ensure the suitability of the products for their own use and to check the information is up to date. U-POL cannot be held responsible for the suitability of use for any of its products, considering the wide range of factors such as application, substrates and handling methods. Since these conditions of use are outside of our control, the company shall not be held liable for any damage resulting from handling or from contact with the product detailed. Moreover, addition of reducers, hardeners or other additives over and above U-POL's recommendations for use, may substantially alter the composition and hazards of the product. U-POL data sheets are available via the U-POL website at WWW.U-POL.COM.