

SAFETY DATA SHEET

HUNTSMAN

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SUPRASEC® 2496

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

1.1 Product identifier

Product name : SUPRASEC® 2496
Product code : 00012289
Product description : isocyanate

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

Identified uses

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution
Industrial use of MDI for Flexible foam and Elastomers, TPU, Polyamide, Polyimide and synthetic Fibers and Manufacturing of other Polymers
Industrial use of MDI for Rigid Foam, Coatings, and Adhesives and Sealants
Industrial use of MDI for Composite Material Based on Wood/Man-made/Mineral/Natural Fibres
Industrial use of MDI in Foundry and Other Composite Material
Professional end uses of MDI
Consumer end uses of MDI

1.3 Details of the supplier of the safety data sheet

Supplier : Huntsman Holland BV
Merseyweg 10
3197 KG Botlek-Rotterdam
The Netherlands
Tel: +31 181 299111
Fax: +31 181 293900
e-mail address of person responsible for this SDS : Global_Product_EHS_HPU@huntsman.com

1.4 Emergency telephone number

Supplier

Telephone number : EUROPE: +32 35 75 1234
USA: +1/800/424.9300
ASIA: +65 6542 9595
China: +86 20 39377888
India +91 22 40506333
Australia: 1800 786 152
New Zealand: 0800 767 437

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

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

Acute Tox. 4, H332
Skin Irrit. 2, H315
Eye Irrit. 2, H319
Resp. Sens. 1, H334
Skin Sens. 1, H317
Carc. 2, H351
STOT SE 3, H335i
STOT RE 2, H373i

Classification according to Directive 1999/45/EC [DPD]

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SECTION 2: Hazards identification

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

- Classification** : Carc. Cat. 3; R40
Xn; R20, R48/20
Xi; R36/37/38
R42/43
- Physical/chemical hazards** : Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures.
- Human health hazards** : Limited evidence of a carcinogenic effect.
Harmful by inhalation.
Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Irritating to eyes, respiratory system and skin.
May cause sensitisation by inhalation and skin contact.
This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons. The onset of the respiratory symptoms may be delayed for several hours after exposure.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



- Signal word** : Danger
- Hazard statements** : Harmful if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
Suspected of causing cancer.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure if inhaled. (respiratory tract)

Precautionary statements

- General** : Not applicable.
- Prevention** : Do not breathe vapour or spray. In case of inadequate ventilation wear respiratory protection. Wear protective gloves/protective clothing/eye protection/face protection.
- Response** : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or if you feel unwell: Call a POISON CENTER or physician.
- Storage** : Not applicable.
- Disposal** : Not applicable.
- Hazardous ingredients** : Isocyanic acid, polymethylenepolyphenylene ester
- Supplemental label elements** : Contains isocyanates. May produce an allergic reaction.
- Supplemental label elements** : Contains isocyanates - See information supplied by the manufacturers. This information is supplied in the current Safety Data Sheet.

Special packaging requirements

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SECTION 2: Hazards identification

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : Not available.

SECTION 3: Composition/information on ingredients

Substance/mixture : Mixture

| Product/ingredient name | Identifiers | % | Classification | | Type |
|--|--|--------|---|---|------|
| | | | 67/548/EEC | Regulation (EC) No. 1272/2008 [CLP] | |
| Isocyanic acid, polymethylenepolyphenylene ester | CAS: 9016-87-9 EC: Polymer | 60-100 | Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43 | Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335i STOT RE 2, H373i | [1] |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | CAS: Not available. EC: Not available. RRN: 01-2119457015-45 | 7-13 | Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43 | Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335i STOT RE 2, H373i | [1] |
| 4,4'-Methylenediphenyl diisocyanate | CAS: 101-68-8 EC: 247-714-0 RRN: 01-2119457014-47 | 3-7 | Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43 | Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335i STOT RE 2, H373i | [1] |

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SECTION 3: Composition/information on ingredients

| | | | | | |
|--|--|--|---|--|--|
| | | | See Section 16 for the full text of the R-phrases declared above. | See Section 16 for the full text of the H-statements declared above. | |
|--|--|--|---|--|--|

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is laboured, oxygen should be administered by qualified personnel.
- Skin contact** : After contact with skin, wash immediately with plenty of warm soapy water. Get medical attention if irritation develops. Wash clothing before reuse. Clean shoes thoroughly before reuse. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water.
- Ingestion** : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash out mouth with water. Get medical attention if symptoms appear.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

- Eye contact** : Irritating to eyes.
- Inhalation** : LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.
- Skin contact** : Irritating to skin. May cause sensitisation by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitisers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
- Ingestion** : Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness

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SECTION 4: First aid measures

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media** : Foam, CO2 or dry powder.
- Unsuitable extinguishing media** : Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

5.2 Special hazards arising from the substance or mixture

- Hazards from the substance or mixture** : No specific hazard.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

- Special precautions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.
- Additional information** : Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Containers may burst if overheated.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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SECTION 6: Accidental release measures

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

6.3 Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : If the product is in its solid form: Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely. If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable adsorbent material. Leave to react for at least 30 minutes. Do not absorb onto sawdust or other combustible materials. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapour. Neutralise small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminants are given in Section 16. See also brochure PU 193-1 (see section 16).

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Not applicable.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)

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SECTION 7: Handling and storage

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

| Product/ingredient name | Exposure limit values |
|--|---|
| Isocyanic acid, polymethylenepolyphenylene ester | EH40/2005 WELs (United Kingdom (UK), 8/2007). Skin sensitiser. Notes: as NCO STEL: 0.07 mg/m ³ , (as NCO) 15 minute(s). TWA: 0.02 mg/m ³ , (as NCO) 8 hour(s). |
| 4,4'-methylenediphenyl diisocyanate | EH40/2005 WELs (United Kingdom (UK), 8/2007). Skin sensitiser. STEL: 0.07 mg/m ³ , (as NCO) 15 minute(s). TWA: 0.02 mg/m ³ , (as NCO) 8 hour(s). |
| o-(p-isocyanatobenzyl)phenyl isocyanate | EH40/2005 WELs (United Kingdom (UK), 8/2007). Skin sensitiser. Notes: as NCO STEL: 0.07 mg/m ³ , (as NCO) 15 minute(s). TWA: 0.02 mg/m ³ , (as NCO) 8 hour(s). |

Recommended monitoring procedures : Medical supervision of all employees who handle or come in contact with respiratory sensitisers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitisation conditions should not work with MDI based products. The Occupational Exposure Limits listed do not apply to previously sensitised individuals. Sensitised individuals should be removed from any further exposure.

Derived effect levels

| Product/ingredient name | Type | Exposure | Value | Population | Effects |
|--|------|-----------------------|-------------------------|------------|----------|
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | DNEL | Short term Dermal | 50 mg/kg bw/day | Workers | Systemic |
| | DNEL | Short term Inhalation | 0.1 mg/m ³ | Workers | Systemic |
| | DNEL | Short term Dermal | 28.7 mg/cm ² | Workers | Local |
| | DNEL | Short term Inhalation | 0.1 mg/m ³ | Workers | Local |
| | DNEL | Long term Inhalation | 0.05 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Inhalation | 0.05 mg/m ³ | Workers | Local |
| | DNEL | Short term Dermal | 25 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Inhalation | 0.05 mg/m ³ | Consumers | Systemic |
| | DNEL | Short term Oral | 20 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Dermal | 17.2 mg/cm ² | Consumers | Local |
| | DNEL | Short term Inhalation | 0.05 mg/m ³ | Consumers | Local |
| | DNEL | Long term Inhalation | 0.025 mg/m ³ | Consumers | Systemic |

SECTION 8: Exposure controls/personal protection

| | | | | | |
|-------------------------------------|------|-----------------------|-------------------------|-----------|----------|
| 4,4'-Methylenediphenyl diisocyanate | DNEL | Long term Inhalation | 0.025 mg/m ³ | Consumers | Local |
| | DNEL | Short term Inhalation | 0.1 mg/m ³ | Workers | Systemic |
| | DNEL | Short term Dermal | 28.7 mg/cm ² | Workers | Local |
| | DNEL | Short term Inhalation | 0.1 mg/m ³ | Workers | Local |
| | DNEL | Long term Inhalation | 0.05 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Inhalation | 0.05 mg/m ³ | Workers | Local |
| | DNEL | Short term Dermal | 25 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Dermal | 50 mg/kg bw/day | Workers | Systemic |
| | DNEL | Short term Oral | 20 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Dermal | 17.2 mg/cm ² | Consumers | Local |
| | DNEL | Short term Inhalation | 0.05 mg/m ³ | Consumers | Local |
| | DNEL | Long term Inhalation | 0.025 mg/m ³ | Consumers | Systemic |
| | DNEL | Long term Inhalation | 0.025 mg/m ³ | Consumers | Local |
| | DNEL | Short term Inhalation | 0.05 mg/m ³ | Consumers | Systemic |

Predicted effect concentrations

| Product/ingredient name | Type | Compartment Detail | Value | Method Detail |
|--|------|------------------------|----------|--------------------|
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | PNEC | Fresh water | 1 mg/l | Assessment Factors |
| | PNEC | Marine | 0.1 mg/l | Assessment Factors |
| | PNEC | Soil | 1 mg/kg | Assessment Factors |
| | PNEC | Sewage Treatment Plant | 1 mg/l | Assessment Factors |
| 4,4'-Methylenediphenyl diisocyanate | PNEC | Fresh water | 1 mg/l | Assessment Factors |
| | PNEC | Sewage Treatment Plant | 1 mg/l | Assessment Factors |
| | PNEC | Soil | 1 mg/kg | Assessment Factors |
| | PNEC | Marine | 0.1 mg/l | Assessment Factors |

8.2 Exposure controls

Appropriate engineering controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective occupational exposure limits. MDI can only be smelled if the occupational exposure limit has been exceeded considerably.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

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SECTION 8: Exposure controls/personal protection

Skin protection

Hand protection

- : Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include :Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychloroprene (Neoprene*), Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyvinyl chloride ("PVC" or "vinyl"), Fluoroelastomer (Viton*).

When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended.

When only brief contact is expected, a glove with protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN374) is recommended. Contaminated gloves should be decontaminated and disposed of.

Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to : other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Use gloves approved to relevant standards e.g. EN 374 (Europe), F739 (US). Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material and dexterity. Always seek advice from glove suppliers. Additional information can be found for instance at www.gisbau.de.

Body protection

- : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Body: Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek-Pro 'F' disposable coverall.

Other skin protection

- : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

- : In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state : Liquid.
- Colour : Not available.
- Odour : slightly musty
- Odour threshold : Not available.
- pH : Not applicable.

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SECTION 9: Physical and chemical properties

| | | | |
|---|--|----|-------|
| Melting point/freezing point | : Not available. | | |
| Initial boiling point and boiling range | : Not available. | | |
| Flash point | : Closed cup: 220°C Open cup: 220°C | | |
| Evaporation rate | : Not available. | | |
| Flammability (solid, gas) | : Not available. | | |
| Burning time | : Not applicable. | | |
| Burning rate | : Not applicable. | | |
| Upper/lower flammability or explosive limits | : Not explosive | | |
| Vapour pressure | : Not available. | | |
| Vapour density | : 8.5 | | |
| Relative density | : Not available. | | |
| Solubility(ies) | | | |
| Water solubility | : | | |
| | | | |
| Other | : insoluble in water. | | |
| Partition coefficient: n-octanol/water (LogK_{ow}) | : Not applicable. Reacts with water and octanol. | | |
| Auto-ignition temperature | : Not available. | | |
| Decomposition temperature | : Not available. | | |
| Viscosity | : Dynamic: 65 to 130 mPa·s | 25 | deg C |
| Explosive properties | : Not available. | | |
| Oxidising properties | : Not available. | | |

9.2 Other information

Density : 1.23 g/cm³ [25°C (77°F)]

SECTION 10: Stability and reactivity

| | |
|--|---|
| 10.1 Reactivity | : No specific test data related to reactivity available for this product or its ingredients. |
| 10.2 Chemical stability | : Stable at room temperature. |
| 10.3 Possibility of hazardous reactions | : Reaction with water (moisture) produces CO ₂ -gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas. None known |
| 10.4 Conditions to avoid | : Avoid high temperatures. |
| 10.5 Incompatible materials | : Water, alcohols, amines, bases, and acids. |
| 10.6 Hazardous decomposition products | : Combustion products may include: carbon oxides (CO, CO ₂) , nitrogen oxides (NO, NO ₂ etc.) , hydrocarbons , HCN. |

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

| Product/ingredient name | Endpoint | Species | Result | Exposure |
|--|---------------------------------|-----------------------|------------------------|----------|
| Isocyanic acid, polymethylenepolyphenylene ester | LC50 Inhalation Dusts and mists | Rat - Male, Female | 0.49 mg/m ³ | 4 hours |
| | LD50 Dermal | Rabbit - Male, Female | >9400 mg/kg | - |
| | LD50 Oral | Rat - Male | >10000 mg/kg | - |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | LC50 Inhalation Dusts and mists | Rat - Male, Female | 0.49 mg/L | 4 hours |
| | LD50 Dermal | Rabbit - Male, Female | >9400 mg/kg | - |
| | LD50 Oral | Rat - Male | >10000 mg/kg | - |
| 4,4'-Methylenediphenyl diisocyanate | LC50 Inhalation Dusts and mists | Rat - Male, Female | 0.49 mg/L | 4 hours |
| | LD50 Dermal | Rabbit - Male, Female | >9400 mg/kg | - |
| | LD50 Oral | Rat - Male | >10000 mg/kg | - |
| | LD50 Oral | Rat - Male | >10000 mg/kg | - |

Acute toxicity estimates

| Route | ATE value |
|------------------------------|------------|
| Inhalation (dusts and mists) | 1.384 mg/l |

Irritation/Corrosion

| Product/ingredient name | Test | Species | Route of exposure | Result |
|--|--|---------|-------------------|---------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin | Mild irritant |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes | Non-irritant. |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin | Irritant |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes | Non-irritant. |
| 4,4'-Methylenediphenyl diisocyanate | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin | Irritant |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes | Non-irritant. |

Conclusion/Summary

| | | |
|-------------|--|---------------------|
| Skin | : Isocyanic acid, polymethylenepolyphenylene ester | Irritating to skin. |
| | Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | Irritating to skin. |
| | 4,4'-Methylenediphenyl diisocyanate | Irritating to skin. |

| | | | |
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Eyes : Isocyanic acid, polymethylenepolyphenylene ester
 Based on the human occupational exposure data, this substance is considered as irritating to eyes.

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate
 Based on the human occupational exposure data, this substance is considered as irritating to eyes.

4,4'-Methylenediphenyl diisocyanate
 Based on the human occupational exposure data, this substance is considered as irritating to eyes.

Respiratory Sensitiser : No additional information.

| Product/ingredient name | Test | Route of exposure | Species | Result |
|--|--|-------------------|------------|-----------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 429 Skin Sensitisation: Local Lymph Node Assay No official guidelines | skin | Mouse | Sensitising |
| | | Respiratory | Guinea pig | Sensitising |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | - | skin | Mouse | Sensitising |
| | | Respiratory | Guinea pig | Sensitising |
| 4,4'-Methylenediphenyl diisocyanate | OECD 429 Skin Sensitisation: Local Lymph Node Assay OECD 406 Skin Sensitization No official guidelines | skin | Mouse | Sensitising |
| | | skin | Guinea pig | Not sensitizing |
| | | Respiratory | Guinea pig | Sensitising |

Conclusion/Summary : No additional information.

Mutagenicity

| Product/ingredient name | Test | Result |
|--|---|-----------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 474 | Negative |
| | - | Equivocal |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | EU EC B.13/14 Mutagenicity - Reverse Mutation Test using Bacteria | Negative |
| | OECD 474 Mammalian Erythrocyte Micronucleus Test | Negative |
| 4,4'-Methylenediphenyl diisocyanate | EU EC B.13/14 Mutagenicity - Reverse Mutation Test using Bacteria | Negative |
| | OECD 474 Mammalian Erythrocyte Micronucleus Test | Negative |

Conclusion/Summary : Diphenylmethane 4,4'-diisocyanate: No mutagenic effect.

Carcinogenicity

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| Product/ingredient name | Test | Species | Exposure | Result | Route of exposure | Target organs |
|--|--|---------|--------------------------|----------|-------------------|---------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies | Rat | 2 years; 5 days per week | Negative | Inhalation | - |
| | EU | Rat | 2 years; 5 days per week | Negative | Inhalation | - |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies | Rat | 2 years; 5 days per week | Positive | Inhalation | lungs |
| 4,4'-Methylenediphenyl diisocyanate | OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies | Rat | 2 years; 5 days per week | Positive | Inhalation | lungs |

Reproductive toxicity

Conclusion/Summary : Diphenylmethane 4,4'-diisocyanate: No known significant effects or critical hazards.

Teratogenicity

| Product/ingredient name | Test | Species | Result/Result type |
|--|--|--------------------|--------------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 414 Prenatal Developmental Toxicity Study | Rat - Female | 12 mg/m3 NOAEL |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | OECD 414 Prenatal Developmental Toxicity Study | Rat - Male, Female | 12 mg/m3 NOAEL |
| 4,4'-Methylenediphenyl diisocyanate | OECD 414 Prenatal Developmental Toxicity Study | Rat - Female | 12 mg/m3 NOAEL |

Specific target organ toxicity (single exposure)

| Product/ingredient name | Category | Route of exposure | Target organs |
|--|------------|-------------------|------------------------------|
| Isocyanic acid, polymethylenepolyphenylene ester | Category 3 | Inhalation | Respiratory tract irritation |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | Category 3 | Inhalation | Respiratory tract irritation |
| 4,4'-Methylenediphenyl diisocyanate | Category 3 | Inhalation | Respiratory tract irritation |

Specific target organ toxicity (repeated exposure)

| Product/ingredient name | Category | Route of exposure | Target organs |
|--|------------|-------------------|-------------------|
| Isocyanic acid, polymethylenepolyphenylene ester | Category 2 | Inhalation | respiratory tract |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | Category 2 | Inhalation | respiratory tract |
| 4,4'-Methylenediphenyl diisocyanate | Category 2 | Inhalation | respiratory tract |

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

| | | | |
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- Inhalation** : LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.
- Ingestion** : Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.
- Skin contact** : Irritating to skin. May cause sensitisation by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
- Eye contact** : Irritating to eyes.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma
- Ingestion** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

| Product/ingredient name | Test | Result type | Result | Target organs |
|--|--|----------------------|-----------------------|---------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies | NOEC Dusts and mists | 0.2 mg/m ³ | - |

- Conclusion/Summary** : Not available.
- General** : May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

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- Carcinogenicity** : Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m³), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m³ and no effects at 0.2 mg/m³. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur.
- IARC** : Isocyanic acid, polymethylenepolyphenylene ester 3
 4,4'-Methylenediphenyl diisocyanate 3
 4,4'-Methylenediphenyl diisocyanate 3
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations, which are well in excess of defined occupational exposure limits.
- Fertility effects** : Not available.
- Other information** : Not available.

SECTION 12: Ecological information

12.1 Toxicity

| Product/ingredient name | Test | Endpoint | Exposure | Species | Result |
|--|--|---------------|---------------------|----------|------------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 209 Activated Sludge, Respiration Inhibition Test | Acute EC50 | 3 hours Static | Bacteria | >100 mg/L |
| | OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test | Acute EC50 | 24 hours Static | Daphnia | >1000 mg/L |
| | OECD 203 Fish, Acute Toxicity Test | Acute LC50 | 96 hours Static | Fish | >1000 mg/L |
| | OECD 201 Alga, Growth Inhibition Test | Chronic EC50 | 72 hours Static | Algae | >1640 mg/L |
| | OECD 211 <i>Daphnia</i> Magna Reproduction Test | Chronic NOEC | 21 days Semi-static | Daphnia | >10 mg/L |
| | OECD 201 Alga, Growth Inhibition Test | Chronic NOECr | 72 hours Static | Algae | 1640 mg/L |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | OECD 209 Activated Sludge, Respiration Inhibition Test | Acute EC50 | 3 hours Static | Bacteria | >100 mg/L |
| | OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test | Acute EC50 | 24 hours Static | Daphnia | >1000 mg/L |
| | OECD 203 Fish, Acute Toxicity Test | Acute LC50 | 96 hours Static | Fish | >1000 mg/L |
| | OECD 211 <i>Daphnia</i> Magna Reproduction Test | Chronic NOEC | 21 days Semi-static | Daphnia | >10 mg/L |
| 4,4'-Methylenediphenyl diisocyanate | OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test | Acute EC50 | 24 hours Static | Daphnia | >1000 mg/L |
| | OECD 203 Fish, Acute Toxicity Test | Acute LC50 | 96 hours Static | Fish | >1000 mg/L |
| | OECD 211 <i>Daphnia</i> Magna Reproduction Test | Chronic NOEC | 21 days | Daphnia | >10 mg/L |

| | | | |
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SECTION 12: Ecological information

| | | | | | |
|---------------------------------------|---------------|-----------------------------------|-------|------|------|
| Reproduction Test | | | | | |
| OECD 201 Alga, Growth Inhibition Test | Chronic NOECr | Semi-static 72 hours Static | Algae | 1640 | mg/L |

12.2 Persistence and degradability

| Product/ingredient name | Test | Period | Result |
|--|--|---------|--------|
| Isocyanic acid, polymethylenepolyphenylene ester | OECD 302C Inherent Biodegradability: Modified MITI Test (II) | 28 days | 0 % |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | OECD 302C Inherent Biodegradability: Modified MITI Test (II) | 28 days | 0 % |
| 4,4'-Methylenediphenyl diisocyanate | OECD 302C Inherent Biodegradability: Modified MITI Test (II) | 28 days | 0 % |

Conclusion/Summary : Diphenylmethane 4,4'-diisocyanate: Not biodegradable

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|--|-----------------------|------------|------------------|
| Isocyanic acid, polymethylenepolyphenylene ester | Fresh water 0.8 days | - | Not readily |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | - | - | Not readily |
| 4,4'-Methylenediphenyl diisocyanate | Fresh water 0.83 days | - | Not readily |

12.3 Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|--|--------------------|-----|-----------|
| Isocyanic acid, polymethylenepolyphenylene ester | - | 200 | high |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | 4.51 | 200 | high |
| 4,4'-Methylenediphenyl diisocyanate | 4.51 | - | high |

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino- diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

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SECTION 12: Ecological information

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

12.7 Other ecological information

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste : Yes.

European waste catalogue (EWC)

| Waste code | Waste designation |
|------------|--|
| 08 05 01* | waste isocyanates |
| 16 03 05* | organic wastes containing dangerous substances |

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

| | 14.1 UN number | 14.2 UN proper shipping name |
|-----------------|----------------|------------------------------|
| ADR/RID | Not regulated. | - |
| ADN/ADNR | Not regulated. | - |
| IMDG | Not regulated. | - |
| IATA | Not regulated. | - |

| | 14.3 Transport hazard class(es) | 14.4 Packing group | 14.5 Environmental hazards | 14.6 Special precautions for user | Additional information |
|-----------------|---------------------------------|--------------------|----------------------------|-----------------------------------|------------------------|
| ADR/RID | - | - | No. | Not available. | - |
| ADN/ADNR | - | - | No. | Not available. | - |
| IMDG | - | - | No. | Not available. | - |

| | | | |
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SECTION 14: Transport information

| | | | | | |
|------|---|---|-----|----------------|---|
| IATA | - | - | No. | Not available. | - |
|------|---|---|-----|----------------|---|

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed

Priority List Chemicals : Listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed

Integrated pollution prevention and control list (IPPC) - Water : Not listed

| Product/ingredient name | Carcinogenic effects | Mutagenic effects | Developmental effects | Fertility effects |
|--|----------------------|-------------------|-----------------------|-------------------|
| Isocyanic acid, polymethylenepolyphenylene ester | Carc. 2, H351 | - | - | - |
| Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate | Carc. 2, H351 | - | - | - |
| 4,4'-Methylenediphenyl diisocyanate | Carc. 2, H351 | - | - | - |

National regulations

References : The provision of Safety Data Sheets comes under Regulation 6 of CHIP (CHIP is the recognised abbreviation for the Chemicals Hazard Information and Packaging Regulations). This is an addition to the Health and Safety at Work Act 1974.

International regulations

Chemical Weapons Convention List Schedule I Chemicals : Not listed

| | | | |
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SECTION 15: Regulatory information

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

15.2 Chemical Safety Assessment : Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

SECTION 16: Other information

☑ Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

| Classification | Justification |
|---------------------|--------------------|
| Acute Tox. 4, H332 | Calculation method |
| Skin Irrit. 2, H315 | Calculation method |
| Eye Irrit. 2, H319 | Calculation method |
| Resp. Sens. 1, H334 | Calculation method |
| Skin Sens. 1, H317 | Calculation method |
| Carc. 2, H351 | Calculation method |
| STOT SE 3, H335i | Calculation method |
| STOT RE 2, H373i | Calculation method |

Full text of abbreviated H statements : 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.
 H335i May cause respiratory irritation.
 H351 Suspected of causing cancer.
 H373i May cause damage to organs through prolonged or repeated exposure if inhaled.

Full text of classifications [CLP/GHS] : Acute Tox. 4, H332 ACUTE TOXICITY: INHALATION - Category 4
 Carc. 2, H351 CARCINOGENICITY - Category 2
 Eye Irrit. 2, H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
 Resp. Sens. 1, H334 RESPIRATORY SENSITIZATION - Category 1
 Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
 Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1
 STOT RE 2, H373i SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE): INHALATION [respiratory tract] - Category 2
 STOT SE 3, H335i SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE): INHALATION [Respiratory tract irritation] - Category 3

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

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SECTION 16: Other information

| | |
|--|---|
| Full text of classifications [DSD/DPD] | : Carc. Cat. 3 - Carcinogen category 3 Xn - Harmful Xi - Irritant |
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| Date of printing | : 8/17/2012. |
| Date of issue/ Date of revision | : 8/17/2012. |
| Date of previous issue | : |
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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Liquid decontaminants (percentages by weight or volume) :

Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %

Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2. Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

Literature reference: PU 193-1 : 'MDI-Based Compositions : Hazards and Safe Handling Procedures.'

PU 181-15 : Recommended melting procedures for MDI-based isocyanates.

ISOPA Guidelines for safe Loading/Unloading, Transportation, Storage of TDI and MDI , Ref.03-96 PSC-0005-GUIDL.

SPI PMDI User Guidelines for the Chemical Protective Clothing Selection.

References of methods used in the Physico-Chemical Properties section are reported in Annex V part A to Commission Directive 92/69/EEC of 31 July 1992 adapting to technical progress for the Seventeenth time Council Directive 67/548/EEC.

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Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

List of use descriptors : **Identified use name:** Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC15
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU03, SU08, SU09, SU10
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ERC03, ERC06a, ERC06c

Environmental contributing scenarios : **ERC02: Formulation of preparations*** - ERC02
ERC03: Formulation in materials - ERC03
ERC06a: Industrial use resulting in manufacture of another substance (use of intermediates) - ERC06a
ERC06c: Industrial use of monomers for manufacture of thermoplastics - ERC06c

Health Contributing scenarios : **PROC01: Use in closed process, no likelihood of exposure** - PROC01
PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) - PROC05
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC09
PROC15: Use as laboratory reagent - PROC15

| | |
|--|---|
| Number of the ES | : Exposure Scenario Cluster 2 |
| Industry Association | : ISOPA |
| Processes and activities covered by the exposure scenario | : - Manufacturing of other substances: SU 3, SU 8, SU 9 PROC 1, PROC2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15 ERC 2, ERC 3, ERC 6a - Formulating, Repackaging & Distribution: SU 3, SU 10 PROC 1, PROC2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15 ERC 2, ERC 3, ERC 6c |

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC02: Formulation of preparations*

| | |
|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 520,000 Fraction of Regional tonnage used locally: 0.019 Average local daily tonnage (kg/d):33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC03: Formulation in materials

| | |
|--------------------------------------|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 520,000 Fraction of Regional tonnage used locally: 0.019 Average local daily tonnage (kg/d):33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |

| | |
|--|--|
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC06a: Industrial use resulting in manufacture of another substance (use of intermediates)

| | |
|---|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 520,000 Fraction of Regional tonnage used locally: 0.019 Average local daily tonnage (kg/d):33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |

| | |
|--|---|
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC06c: Industrial use of monomers for manufacture of thermoplastics

| | |
|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 520,000 Fraction of Regional tonnage used locally: 0.019 Average local daily tonnage (kg/d):33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |

Conditions and measures related to external treatment of waste for disposal : Not applicable.

Conditions and measures related to external recovery of waste : Not applicable.

Contributing exposure scenario controlling worker exposure for: PROC01: Use in closed process, no likelihood of exposure

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

Respiratory protection : **if exposure may be possible:**
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Provide extract ventilation to points where emissions occur. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Section 3 - Exposure estimation and reference to its source**Website:** : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf>**Exposure estimation and reference to its source - Environment: ERC02: Formulation of preparations***

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.85×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.85 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC03: Formulation in materials

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.85×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.85 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC06a: Industrial use resulting in manufacture of another substance (use of intermediates)

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.85×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.85 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC06c: Industrial use of monomers for manufacture of thermoplastics

| | |
|---|---|
| Exposure assessment (environment): | : Same for all ERC Used EUSES model. |
| Exposure estimation | : <u>Predicted Environmental Concentration</u> : Fresh water (mg/l) : 6.85x10 ⁻³ Marine water (mg/l) : 5.43x10 ⁻⁴ Agricultural soil (mg/kg) : 0.239 Grassland (mg/kg) : 0.239 Secondary Poisoning: Not relevant. Humans exposed via the environment : Not relevant. |
| | <u>Risk characterisation ratio (PEC/PNEC):</u> Fresh water(mg/l): < 6.85x10 ⁻³ Marine water (mg/l) : < 5.43x10 ⁻³ Agricultural soil :(mg/kg) : < 0.239 Grassland : (mg/kg) : < 0.239 Secondary Poisoning : Not relevant. Humans exposed via the environment : Not relevant. |

Exposure estimation and reference to its source - Workers: PROC01: Use in closed process, no likelihood of exposure

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.013 Risk Characterisation Ratio inhalation-long term: 0.260 Inhalation exposure-short term (mg/m ³): 0.026 Risk Characterisation Ratio inhalation-short term: 0.260 |

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.013 Risk Characterisation Ratio inhalation-long term: 0.260 Inhalation exposure-short term (mg/m ³): 0.026 Risk Characterisation Ratio inhalation-short term: 0.260 |

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.009 Risk Characterisation Ratio inhalation-long term: 0.184 Inhalation exposure-short term (mg/m ³): 0.018 Risk Characterisation Ratio inhalation-short term: 0.184 |

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.008 Risk Characterisation Ratio inhalation-long term: 0.164 Inhalation exposure-short term (mg/m ³): 0.016 Risk Characterisation Ratio inhalation-short term: 0.164 |

Exposure estimation and reference to its source - Workers: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
|-------------------------------------|--|

| | |
|---|--|
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.029 Risk Characterisation Ratio inhalation-long term: 0.582 Inhalation exposure-short term (mg/m ³): 0.058 Risk Characterisation Ratio inhalation-short term: 0.582 |
| Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities | |
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.029 Risk Characterisation Ratio inhalation-long term: 0.582 Inhalation exposure-short term (mg/m ³): 0.058 Risk Characterisation Ratio inhalation-short term: 0.582 |
| Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | |
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.029 Risk Characterisation Ratio inhalation-long term: 0.582 Inhalation exposure-short term (mg/m ³): 0.058 Risk Characterisation Ratio inhalation-short term: 0.582 |
| Exposure estimation and reference to its source - Workers: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | |
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.005 Risk Characterisation Ratio inhalation-long term: 0.094 Inhalation exposure-short term (mg/m ³): 0.009 Risk Characterisation Ratio inhalation-short term: 0.094 |
| Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent | |
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.006 Risk Characterisation Ratio inhalation-long term: 0.112 Inhalation exposure-short term (mg/m ³): 0.011 Risk Characterisation Ratio inhalation-short term: 0.112 |

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

| | |
|--------------------|--|
| Environment | : Not relevant. |
| Health | : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Further information on the assumptions contained in this Exposure Scenario can be found at: http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf |

Additional good practice advice beyond the REACH CSA

| | |
|--------------------|-------------------|
| Environment | : Not applicable. |
| Health | : Not applicable. |

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Industrial use of MDI for Flexible foam and Elastomers, TPU, Polyamide, Polyimide and synthetic Fibers and Manufacturing of other Polymers

List of use descriptors : **Identified use name:** Industrial use of MDI for Flexible foam and Elastomers, TPU, Polyamide, Polyimide and synthetic Fibers and Manufacturing of other Polymers
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC14, PROC15, PROC21
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ERC03, ERC06c

Environmental contributing scenarios : **ERC02: Formulation of preparations*** - ERC02
ERC03: Formulation in materials - ERC03
ERC06c: Industrial use of monomers for manufacture of thermoplastics - ERC06c

Health Contributing scenarios : **PROC01: Use in closed process, no likelihood of exposure** - PROC01
PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) - PROC05
PROC07: Industrial spraying - PROC07
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC09
PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation - PROC14
PROC15: Use as laboratory reagent - PROC15
PROC21: Low energy manipulation of substances bound in materials and/or articles - PROC21

| | |
|--|--|
| Number of the ES | : Exposure Scenario Cluster 3 |
| Industry Association | : ISOPA |
| Processes and activities covered by the exposure scenario | : - flexible foam: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC7, PROC 8a, PROC 8b, PROC 14, PROC 15, PROC 21 ERC 2, ERC 3, ERC 6c - Elastomers, TPU, Polyamide, Polyimine and Synthetic Fibers; Manufacturing of other substances: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 14, PROC 15 ERC 2, ERC 3, ERC 6c |

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC02: Formulation of preparations*

| | |
|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 260000 (flexible foam) / 160000 (elastomers, etc.) Fraction of Regional tonnage used locally: 0.038 (flexible foam) / 0.063 (elastomers, etc.) Average local daily tonnage (kg/d): 33333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC03: Formulation in materials

| | |
|--------------------------------|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |

| | |
|--|--|
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 260000 (flexible foam) / 160000 (elastomers, etc.) Fraction of Regional tonnage used locally: 0.038 (flexible foam) / 0.063 (elastomers, etc.) Average local daily tonnage (kg/d): 33333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10-5 Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC06c: Industrial use of monomers for manufacture of thermoplastics

| | |
|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 260000 (flexible foam) / 160000 (elastomers, etc.) Fraction of Regional tonnage used locally: 0.038 (flexible foam) / 0.063 (elastomers, etc.) Average local daily tonnage (kg/d): 33333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |

| | |
|--|--|
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling worker exposure for: PROC01: Use in closed process, no likelihood of exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100% (unless stated differently).
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).
- Human factors not influenced by risk management** : None identified.
- Area of use:** : Indoor and outdoor use.
- Ventilation control measures** : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
 Provide extract ventilation to points where emissions occur.
 or
 Provide extract ventilation to material transfer points and other openings.
 or
 Handle in a fume cupboard or under extract ventilation.
 or
 demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

Respiratory protection : **if exposure may be possible:**
 Wear suitable gloves tested to EN374.

: **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
 If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
 Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances
 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
 Provide extract ventilation to points where emissions occur.
 or
 Provide extract ventilation to material transfer points and other openings.
 or
 Handle in a fume cupboard or under extract ventilation.
 or
 demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC07: Industrial spraying

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100% (unless stated differently).
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).
- Human factors not influenced by risk management** : None identified.
- Area of use:** : Indoor and outdoor use.
- Ventilation control measures** : Carry out in a vented booth provided with laminar airflow.
or
Carry out in a vented booth or extracted enclosure.
or
Minimise exposure by extracted full enclosure for the operation or equipment.
or
Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a full-face respirator conforming to EN140 with Type A/P2 filter or better.

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100% (unless stated differently).
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).

| | |
|--|--|
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or |

Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: ; Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

| | |
|--|--|
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. |

or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant
worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC02: Formulation of preparations*

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC03: Formulation in materials

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC06c: Industrial use of monomers for manufacture of thermoplastics

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l) : $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil : (mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Workers: PROC01: Use in closed process, no likelihood of exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-long term: 0.260
Inhalation exposure-short term (mg/m³): 0.026
Risk Characterisation Ratio inhalation-short term: 0.260

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-long term: 0.260
Inhalation exposure-short term (mg/m³): 0.026
Risk Characterisation Ratio inhalation-short term: 0.260

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.009
Risk Characterisation Ratio inhalation-long term: 0.184
Inhalation exposure-short term (mg/m³): 0.018
Risk Characterisation Ratio inhalation-short term: 0.184

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.008
Risk Characterisation Ratio inhalation-long term: 0.116
Inhalation exposure-short term (mg/m³): 0.016
Risk Characterisation Ratio inhalation-short term: 0.116

Exposure estimation and reference to its source - Workers: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029 (flexible foam)/ 0.012 (Elastomers)
 Risk Characterisation Ratio inhalation-long term: 0.582 (flexible foam)/ 0.246 (Elastomers)
 Inhalation exposure-short term (mg/m³): 0.058 (flexible foam)/ 0.025 (Elastomers)
 Risk Characterisation Ratio inhalation-short term: 0.582 (flexible foam)/ 0.246 (Elastomers)

Exposure estimation and reference to its source - Workers: PROC07: Industrial spraying

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.011
 Risk Characterisation Ratio inhalation-long term: 0.224
 Inhalation exposure-short term (mg/m³): 0.022
 Risk Characterisation Ratio inhalation-short term: 0.224

Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.005
 Risk Characterisation Ratio inhalation-long term: 0.094
 Inhalation exposure-short term (mg/m³): 0.010
 Risk Characterisation Ratio inhalation-short term: 0.094

Exposure estimation and reference to its source - Workers: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.116
 Inhalation exposure-short term (mg/m³): 0.012
 Risk Characterisation Ratio inhalation-short term: 0.116

Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent

Exposure assessment (human): : Measured data has been used to estimate worker exposure.
Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.112
 Inhalation exposure-short term (mg/m³): 0.011
 Risk Characterisation Ratio inhalation-short term: 0.112

Exposure estimation and reference to its source - Workers: PROC21: Low energy manipulation of substances bound in materials and/or articles

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

SUPRASEC 2496

***Industrial use of MDI for Flexible foam and Elastomers,
TPU, Polyamide, Polyimide and synthetic Fibers and
Manufacturing of other Polymers***

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
Risk Characterisation Ratio inhalation-long term: 0.128
Inhalation exposure-short term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-short term: 0.128

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Environment : Not relevant.
Health : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Further information on the assumptions contained in this Exposure Scenario can be found at:
<http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf>

Additional good practice advice beyond the REACH CSA

Environment : Not applicable.
Health : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Industrial use of MDI for Rigid Foam, Coatings and Adhesives and Sealants

List of use descriptors : **Identified use name:** Industrial use of MDI for Rigid Foam, Coatings, and Adhesives and Sealants
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC15, PROC21
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ERC03, ERC05, ERC06c

Environmental contributing scenarios : **ERC02: Formulation of preparations*** - ERC02
ERC03: Formulation in materials - ERC03
ERC05: Industrial use resulting in inclusion into or onto a matrix - ERC05
ERC06c: Industrial use of monomers for manufacture of thermoplastics - ERC06c

Health Contributing scenarios : **PROC01: Use in closed process, no likelihood of exposure** - PROC01
PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) - PROC05
PROC07: Industrial spraying - PROC07
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC09
PROC10: Roller application or brushing - PROC10
PROC13: Treatment of articles by dipping and pouring - PROC13
PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation - PROC14
PROC15: Use as laboratory reagent - PROC15
PROC21: Low energy manipulation of substances bound in materials and/or articles - PROC21

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| Number of the ES | : Exposure Scenario Cluster 4 |
| Industry Association | : ISOPA |
| Processes and activities covered by the exposure scenario | : - Rigid foam: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC10, PROC 15, PROC 21 ERC 2, ERC 3, ERC 6c - Coatings: PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 15 ERC 2, ERC 3, ERC 5, ERC 6c |

- Adhesives and Sealants:

PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b,
 PROC 9, PROC 10, PROC 13, PROC 14, PROC 15
 ERC 2, ERC 3, ERC 5, ERC 6c

Section 2 - Exposure controls

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| Contributing exposure scenario controlling environmental exposure for: ERC02: Formulation of preparations* | |
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 1,120,000 (Rigid foam)/ 60,000 (Coating.)/ 300,000 (Sealants and adhesives) Fraction of Regional tonnage used locally: 8.9x10 ⁻³ (Rigid foam)/ 0.167 (Coating.)/ 0.033 (Sealants and adhesives) Maximum daily site tonnage (kg/day): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): >= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC03: Formulation in materials

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|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 1,120,000 (Rigid foam)/ 60,000 (Coating.)/ 300,000 (Sealants and adhesives) Fraction of Regional tonnage used locally: 8.9x10 ⁻³ (Rigid foam)/ 0.167 (Coating.)/ 0.033 (Sealants and adhesives) Maximum daily site tonnage (kg/day): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): >= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC05: Industrial use resulting in inclusion into or onto a matrix

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|--------------------------------------|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 1,120,000 (Rigid foam)/ 60,000 (Coating.)/ 300,000 (Sealants and adhesives) Fraction of Regional tonnage used locally: 8.9x10 ⁻³ (Rigid foam)/ 0.167 (Coating.)/ 0.033 (Sealants and adhesives) Maximum daily site tonnage (kg/day): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): >= 300 |

| | |
|--|--|
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2×10^{-5} Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC06c: Industrial use of monomers for manufacture of thermoplastics

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| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 1,120,000 (Rigid foam)/ 60,000 (Coating.)/ 300,000 (Sealants and adhesives) Fraction of Regional tonnage used locally: 8.9×10^{-3} (Rigid foam)/ 0.167 (Coating.)/ 0.033 (Sealants and adhesives) Maximum daily site tonnage (kg/day): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): ≥ 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2×10^{-5} Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |

| | |
|--|---|
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling worker exposure for: PROC01: Use in closed process, no likelihood of exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:

Provide extract ventilation to points where emissions occur.

or

Provide extract ventilation to material transfer points and other openings.

or

Handle in a fume cupboard or under extract ventilation.

or

demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:

Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

| | |
|--|--|
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant |

worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:

Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**

If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.

Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:

Provide extract ventilation to points where emissions occur.

or

Provide extract ventilation to material transfer points and other openings.

or

Handle in a fume cupboard or under extract ventilation.

or

demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:

Wear suitable gloves tested to EN374.

| | |
|---|--|
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |
| Contributing exposure scenario | controlling worker exposure for: PROC07: Industrial spraying |
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor use. |
| Technical conditions and measures to control dispersion from source towards the worker | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Ventilation control measures | : Carry out in a vented booth provided with laminar airflow. or Carry out in a vented booth or extracted enclosure. or Minimise exposure by extracted full enclosure for the operation or equipment. or Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a full-face respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |

| | |
|--|--|
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |
| Contributing exposure scenario controlling worker exposure for: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) | |
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC10: Roller application or brushing

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|---|
| Ventilation control measures | <p>: At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | <p>: At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC02: Formulation of preparations*

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC03: Formulation in materials

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC05: Industrial use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC06c: Industrial use of monomers for manufacture of thermoplastics

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Workers: PROC01: Use in closed process, no likelihood of exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-long term: 0.260
Inhalation exposure-short term (mg/m³): 0.026
Risk Characterisation Ratio inhalation-short term: 0.260

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-long term: 0.260
Inhalation exposure-short term (mg/m³): 0.026
Risk Characterisation Ratio inhalation-short term: 0.260

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.009
Risk Characterisation Ratio inhalation-long term: 0.184
Inhalation exposure-short term (mg/m³): 0.018
Risk Characterisation Ratio inhalation-short term: 0.184

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.008
Risk Characterisation Ratio inhalation-long term: 0.164
Inhalation exposure-short term (mg/m³): 0.016
Risk Characterisation Ratio inhalation-short term: 0.164

Exposure estimation and reference to its source - Workers: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC07: Industrial spraying

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.011 (hotmelt)/ 0.010
 Risk Characterisation Ratio inhalation-long term: 0.224 (hotmelt)/ 0.204
 Inhalation exposure-short term (mg/m³): 0.022 (hotmelt)/ 0.020
 Risk Characterisation Ratio inhalation-short term: 0.224 (hotmelt)/ 0.204

Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.005
 Risk Characterisation Ratio inhalation-long term: 0.094
 Inhalation exposure-short term (mg/m³): 0.009
 Risk Characterisation Ratio inhalation-short term: 0.094

Exposure estimation and reference to its source - Workers: PROC10: Roller application or brushing

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.017
 Risk Characterisation Ratio inhalation-long term: 0.344
 Inhalation exposure-short term (mg/m³): 0.034
 Risk Characterisation Ratio inhalation-short term: 0.344

Exposure estimation and reference to its source - Workers: PROC13: Treatment of articles by dipping and pouring

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.017
 Risk Characterisation Ratio inhalation-long term: 0.344
 Inhalation exposure-short term (mg/m³): 0.034
 Risk Characterisation Ratio inhalation-short term: 0.344

Exposure estimation and reference to its source - Workers: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.116
 Inhalation exposure-short term (mg/m³): 0.012
 Risk Characterisation Ratio inhalation-short term: 0.116

Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.112
 Inhalation exposure-short term (mg/m³): 0.011
 Risk Characterisation Ratio inhalation-short term: 0.112

Exposure estimation and reference to its source - Workers: PROC21: Low energy manipulation of substances bound in materials and/or articles

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.260
 Inhalation exposure-short term (mg/m³): 1.875
 Risk Characterisation Ratio inhalation-short term: 0.128

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Environment : Not applicable.

Health : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Further information on the assumptions contained in this Exposure Scenario can be found at:
<http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf>

Additional good practice advice beyond the REACH CSA

Environment : Not applicable.

Health : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Industrial use of MDI for Composite Material Based on Wood/Man-made/Mineral/Natural Fibres

List of use descriptors : **Identified use name:** Industrial use of MDI for Composite Material Based on Wood/Man-made/Mineral/Natural Fibres
Process Category: PROC 0a, PROC 0b, PROC 0c, PROC01, PROC02, PROC03, PROC04, PROC07, PROC08a, PROC08b, PROC10, PROC14, PROC15, PROC21
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ERC03, ERC05

Environmental contributing scenarios : **ERC02: Formulation of preparations*** - ERC02
ERC03: Formulation in materials - ERC03
ERC05: Industrial use resulting in inclusion into or onto a matrix - ERC05

Health Contributing scenarios : **PROC 0a: Removal of solidified materials by mechanical means in containers, vessels, blenders** - PROC 0a
PROC 0c: Cleaning production line area with brush - PROC 0b
PROC 0c: Cleaning production line area with brush - PROC 0c
PROC01: Use in closed process, no likelihood of exposure - PROC01
PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC07: Industrial spraying - PROC07
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC10: Roller application or brushing - PROC10
PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation - PROC14
PROC15: Use as laboratory reagent - PROC15
PROC21: Low energy manipulation of substances bound in materials and/or articles - PROC21

| | |
|-----------------------------|-------------------------------|
| Number of the ES | : Exposure Scenario Cluster 5 |
| Industry Association | : ISOPA |

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC02: Formulation of preparations*

Further specification : Same for all ERC

Product Characteristics : Substance is a unique structure or Substance is complex UVCB
Predominantly hydrophobic
Not biodegradable

| | |
|--|--|
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 43,600 Fraction of Regional tonnage used locally: 0.229 Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC03: Formulation in materials

| | |
|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 43,600 Fraction of Regional tonnage used locally: 0.229 Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |

| | |
|--|--|
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC05: Industrial use resulting in inclusion into or onto a matrix

| | |
|---|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 43,600 Fraction of Regional tonnage used locally: 0.229 Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor:10 Local marine water dilution factor:100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |

| | |
|--|---|
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling worker exposure for: PROC 0a: Removal of solidified materials by mechanical means in containers, vessels, blenders

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers frequency up to: monthly use |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC 0c: Cleaning production line area with brush

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC 0c: Cleaning production line area with brush

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
 Provide extract ventilation to points where emissions occur.
 or
 Provide extract ventilation to material transfer points and other openings.
 or
 Handle in a fume cupboard or under extract ventilation.
 or
 demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
 Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
 If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC01: Use in closed process, no likelihood of exposure

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
 Provide extract ventilation to points where emissions occur.
 or
 Provide extract ventilation to material transfer points and other openings.
 or
 Handle in a fume cupboard or under extract ventilation.
 or
 demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|---|
| Ventilation control measures | <p>: Activities close to the former line: Provide extract ventilation to material transfer points and other openings. Minimal efficiency exhaust ventilation: 25%.</p> <p>Activities close to the mat line: At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : Activities close to the former line: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |
| | At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

| | |
|--|--|
| Contributing exposure scenario controlling worker exposure for: PROC07: Industrial spraying | |
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Carry out in a vented booth provided with laminar airflow. or Carry out in a vented booth or extracted enclosure. or Minimise exposure by extracted full enclosure for the operation or equipment. or Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |

| | |
|-------------------------------|--|
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : If above technical/organisational control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC10: Roller application or brushing

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|---|
| Ventilation control measures | <p>: At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | <p>: Provide extract ventilation to material transfer points and other openings.</p> <p>At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100% (unless stated differently).
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).
- Human factors not influenced by risk management** : None identified.
- Area of use:** : Indoor and outdoor use.
- Ventilation control measures** : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
Provide extract ventilation to points where emissions occur.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Provide extract ventilation to material transfer points and other openings. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC02: Formulation of preparations*

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
 Fresh water (mg/l) : 6.87x10⁻³
 Marine water (mg/l) : 5.43x10⁻⁴
 Agricultural soil (mg/kg) : 0.239
 Grassland (mg/kg) : 0.239
 Secondary Poisoning: Not relevant.
 Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
 Fresh water(mg/l): < 6.87x10⁻³
 Marine water (mg/l) : < 5.43x10⁻³
 Agricultural soil : (mg/kg) : < 0.239
 Grassland : (mg/kg) : < 0.239
 Secondary Poisoning : Not relevant.
 Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC03: Formulation in materials

Exposure assessment (environment): : Same for all ERC
 Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
 Fresh water (mg/l) : 6.87x10⁻³
 Marine water (mg/l) : 5.43x10⁻⁴
 Agricultural soil (mg/kg) : 0.239
 Grassland (mg/kg) : 0.239
 Secondary Poisoning: Not relevant.
 Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
 Fresh water(mg/l): < 6.87x10⁻³
 Marine water (mg/l) : < 5.43x10⁻³
 Agricultural soil : (mg/kg) : < 0.239
 Grassland : (mg/kg) : < 0.239
 Secondary Poisoning : Not relevant.
 Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC05: Industrial use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
 Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
 Fresh water (mg/l) : 6.87x10⁻³
 Marine water (mg/l) : 5.43x10⁻⁴
 Agricultural soil (mg/kg) : 0.239
 Grassland (mg/kg) : 0.239
 Secondary Poisoning: Not relevant.
 Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
 Fresh water(mg/l): < 6.87x10⁻³
 Marine water (mg/l) : < 5.43x10⁻³
 Agricultural soil : (mg/kg) : < 0.239
 Grassland : (mg/kg) : < 0.239
 Secondary Poisoning : Not relevant.
 Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Workers: PROC 0a: Removal of solidified materials by mechanical means in containers, vessels, blenders

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.0056
 Risk Characterisation Ratio inhalation-long term: 0.112
 Inhalation exposure-short term (mg/m³): 0.0112
 Risk Characterisation Ratio inhalation-short term: 0.112

Exposure estimation and reference to its source - Workers: PROC 0c: Cleaning production line area with brush

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.002
Risk Characterisation Ratio inhalation-long term: 0.042
Inhalation exposure-short term (mg/m³): 0.004
Risk Characterisation Ratio inhalation-short term: 0.042

Exposure estimation and reference to its source - Workers: PROC 0c: Cleaning production line area with brush

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.014
Risk Characterisation Ratio inhalation-long term: 0.28
Inhalation exposure-short term (mg/m³): 0.028
Risk Characterisation Ratio inhalation-short term: 0.28

Exposure estimation and reference to its source - Workers: PROC01: Use in closed process, no likelihood of exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.002
Risk Characterisation Ratio inhalation-long term: 0.038
Inhalation exposure-short term (mg/m³): 0.004
Risk Characterisation Ratio inhalation-short term: 0.038

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.038
Risk Characterisation Ratio inhalation-long term: 0.76
Inhalation exposure-short term (mg/m³): 0.076
Risk Characterisation Ratio inhalation-short term: 0.76

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.002
Risk Characterisation Ratio inhalation-long term: 0.038
Inhalation exposure-short term (mg/m³): 0.004
Risk Characterisation Ratio inhalation-short term: 0.038

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.011 (Activities close to the former line)/
0.007 (Activities close to the mat line)
Risk Characterisation Ratio inhalation-long term: 0.227 (Activities close to the former
line)/ 0.136 (Activities close to the mat line)
Inhalation exposure-short term (mg/m³): 0.023 (Activities close to the former line)/
0.014 (Activities close to the mat line)
Risk Characterisation Ratio inhalation-short term: 0.227 (Activities close to the
former line)/ 0.136 (Activities close to the mat line)

Exposure estimation and reference to its source - Workers: PROC07: Industrial spraying

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.010
Risk Characterisation Ratio inhalation-long term: 0.204
Inhalation exposure-short term (mg/m³): 0.020
Risk Characterisation Ratio inhalation-short term: 0.204

Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
Risk Characterisation Ratio inhalation-long term: 0.582
Inhalation exposure-short term (mg/m³): 0.058
Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.002
Risk Characterisation Ratio inhalation-long term: 0.034
Inhalation exposure-short term (mg/m³): 0.003
Risk Characterisation Ratio inhalation-short term: 0.034

Exposure estimation and reference to its source - Workers: PROC10: Roller application or brushing

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.017
Risk Characterisation Ratio inhalation-long term: 0.328
Inhalation exposure-short term (mg/m³): 0.034
Risk Characterisation Ratio inhalation-short term: 0.328

Exposure estimation and reference to its source - Workers: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
Risk Characterisation Ratio inhalation-long term: 0.078
Inhalation exposure-short term (mg/m³): 0.012
Risk Characterisation Ratio inhalation-short term: 0.078

Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
Risk Characterisation Ratio inhalation-long term: 0.112
Inhalation exposure-short term (mg/m³): 0.011
Risk Characterisation Ratio inhalation-short term: 0.112

Exposure estimation and reference to its source - Workers: PROC21: Low energy manipulation of substances bound in materials and/or articles

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.0004
Risk Characterisation Ratio inhalation-long term: 0.008
Inhalation exposure-short term (mg/m³): 0.001
Risk Characterisation Ratio inhalation-short term: 0.008

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Environment : Not applicable.

Health : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Further information on the assumptions contained in this Exposure Scenario can be found at:

Additional good practice advice beyond the REACH CSA

Environment : Not applicable.

Health : Not applicable.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Industrial use of MDI in Foundry and Other Composite Material

List of use descriptors : **Identified use name:** Industrial use of MDI in Foundry and Other Composite Material
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC13, PROC14, PROC15
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC02, ERC03, ERC05, ERC06c

Environmental contributing scenarios : **ERC02: Formulation of preparations*** - ERC02
ERC03: Formulation in materials - ERC03
ERC05: Industrial use resulting in inclusion into or onto a matrix - ERC05
ERC06c: Industrial use of monomers for manufacture of thermoplastics - ERC06c

Health Contributing scenarios : **PROC01: Use in closed process, no likelihood of exposure** - PROC01
PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) - PROC05
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC13: Treatment of articles by dipping and pouring - PROC13
PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation - PROC14
PROC15: Use as laboratory reagent - PROC15

| | |
|--|---|
| Number of the ES | : Exposure Scenario Cluster 6 |
| Industry Association | : ISOPA |
| Processes and activities covered by the exposure scenario | : - Foundry: PROC 1, PROC 2, PROC 3, PROC4, PROC 5, PROC 8a, PROC 8b, PROC14, PROC 15 ERC2, ERC3, ERC5 - Other Composite Material: PROC 1, PROC 2, PROC 3, PROC 5, PROC 8a, PROC 8b, PROC 13, PROC 14, PROC 15 ERC 2, ERC 3, ERC 5, ERC 6c |

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC02: Formulation of preparations*

| | |
|--|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 56,400 (For use in Foundry)/ 1,120,000 (For use in Other Composite Material) Fraction of Regional tonnage used locally: 0.177 (For use in Foundry)/ 8.9x10 ⁻³ (For use in Other Composite Material) Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): >= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC03: Formulation in materials

| | |
|--------------------------------|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 56,400 (For use in Foundry)/ 1,120,000 (For use in Other Composite Material) Fraction of Regional tonnage used locally: 0.177 (For use in Foundry)/ 8.9x10 ⁻³ (For use in Other Composite Material) Average local daily tonnage (kg/d): 33,333 |

| | |
|--|--|
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC05: Industrial use resulting in inclusion into or onto a matrix

| | |
|---|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 56,400 (For use in Foundry)/ 1,120,000 (For use in Other Composite Material) Fraction of Regional tonnage used locally: 0.177 (For use in Foundry)/ 8.9x10 ⁻³ (For use in Other Composite Material) Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year):>= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |

| | |
|--|---|
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC06c: Industrial use of monomers for manufacture of thermoplastics

| | |
|--|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): 56,400 (For use in Foundry)/ 1,120,000 (For use in Other Composite Material) Fraction of Regional tonnage used locally: 0.177 (For use in Foundry)/ 8.9x10 ⁻³ (For use in Other Composite Material) Average local daily tonnage (kg/d): 33,333 |
| Frequency and duration of use | : Type of release: Continuous release. Emission Days (days/year): >= 300 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 1.2x10 ⁻⁵ Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 0 |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |

| | |
|--|--|
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling worker exposure for: PROC01: Use in closed process, no likelihood of exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : For use in Foundry: Provide extract ventilation to material transfer points and other openings. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |

| | |
|--|--|
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : For use in Foundry: Provide extract ventilation to material transfer points and other openings. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|---|---|
| Further specification | : Foundry |
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Provide extract ventilation to material transfer points and other openings. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. |

or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **For use in Foundry:**
Provide extract ventilation to material transfer points and other openings.
Provide extract ventilation to points where emissions occur.

For use in Other Composite Material:
Provide extract ventilation to points where emissions occur.

At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
Provide extract ventilation to material transfer points and other openings.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

| | |
|-------------------------------|--|
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|---|
| Ventilation control measures | <p>: At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | <p>: Provide extract ventilation to material transfer points and other openings.</p> <p>At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100% (unless stated differently).
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).
- Human factors not influenced by risk management** : None identified.
- Area of use:** : Indoor and outdoor use.
- Ventilation control measures** : **For use in Other Composite Material:**
Provide extract ventilation to points where emissions occur.
- At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
Provide extract ventilation to material transfer points and other openings.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better.

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC02: Formulation of preparations*

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC03: Formulation in materials

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC05: Industrial use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.87×10^{-3}
Marine water (mg/l) : 5.43×10^{-4}
Agricultural soil (mg/kg) : 0.239
Grassland (mg/kg) : 0.239
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water(mg/l): $< 6.87 \times 10^{-3}$
Marine water (mg/l) : $< 5.43 \times 10^{-3}$
Agricultural soil :(mg/kg) : < 0.239
Grassland : (mg/kg) : < 0.239
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC06c: Industrial use of monomers for manufacture of thermoplastics

| | |
|---|--|
| Exposure assessment (environment): | : Same for all ERC Used EUSES model. |
| Exposure estimation | : <u>Predicted Environmental Concentration</u> : Fresh water (mg/l) : 6.87×10^{-3} Marine water (mg/l) : 5.43×10^{-4} Agricultural soil (mg/kg) : 0.239 Grassland (mg/kg) : 0.239 Secondary Poisoning: Not relevant. Humans exposed via the environment : Not relevant. |
| | : <u>Risk characterisation ratio (PEC/PNEC):</u> Fresh water(mg/l): $< 6.87 \times 10^{-3}$ Marine water (mg/l) : $< 5.43 \times 10^{-3}$ Agricultural soil : (mg/kg) : < 0.239 Grassland : (mg/kg) : < 0.239 Secondary Poisoning : Not relevant. Humans exposed via the environment : Not relevant. |

Exposure estimation and reference to its source - Workers: PROC01: Use in closed process, no likelihood of exposure

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.002 (Foundry) / 0.013 (Other Composite Material) Risk Characterisation Ratio inhalation-long term: 0.036 (Foundry) / 0.260 (Other Composite Material) Inhalation exposure-short term (mg/m ³): 0.004 (Foundry) / 0.026 (Other Composite Material) Risk Characterisation Ratio inhalation-short term: 0.036 (Foundry) / 0.260 (Other Composite Material) |

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.002 (For use in Foundry)/ 0.013 (For use in Other Composite Material) Risk Characterisation Ratio inhalation-long term: 0.036 (For use in Foundry)/ 0.260 (For use in Other Composite Material) Inhalation exposure-short term (mg/m ³): 0.004 (For use in Foundry)/ 0.026 (For use in Other Composite Material) Risk Characterisation Ratio inhalation-short term: 0.036 (For use in Foundry)/ 0.260 (For use in Other Composite Material) |

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|-------------------------------------|---|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.002 (For use in Foundry)/ 0.009 (For use in Other Composite Material) Risk Characterisation Ratio inhalation-long term: 0.036 (For use in Foundry)/ 0.184 (For use in Other Composite Material) Inhalation exposure-short term (mg/m ³): 0.004 (For use in Foundry) / 0.018 (For use in Other Composite Material) Risk Characterisation Ratio inhalation-short term: 0.036 (For use in Foundry)/ 0.184 (For use in Other Composite Material) |

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
|-------------------------------------|--|

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.004
 Risk Characterisation Ratio inhalation-long term: 0.078
 Inhalation exposure-short term (mg/m³): 0.008
 Risk Characterisation Ratio inhalation-short term: 0.078

Exposure estimation and reference to its source - Workers: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.002 (For use in Foundry)/ 0.029 (For use in Other Composite Material)
 Risk Characterisation Ratio inhalation-long term: 0.036 (For use in Foundry)/ 0.582 (For use in Other Composite Material)
 Inhalation exposure-short term (mg/m³): 0.004 (For use in Foundry)/ 0.058 (For use in Other Composite Material)
 Risk Characterisation Ratio inhalation-short term: 0.036 (For use in Foundry)/ 0.582 (For use in Other Composite Material)

Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC13: Treatment of articles by dipping and pouring

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.017
 Risk Characterisation Ratio inhalation-long term: 0.344
 Inhalation exposure-short term (mg/m³): 0.034
 Risk Characterisation Ratio inhalation-short term: 0.344

Exposure estimation and reference to its source - Workers: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.004 (Foundry) / 0.006 (Other Composite Material)
 Risk Characterisation Ratio inhalation-long term: 0.078 (Foundry) / 0.116 (Other Composite Material)
 Inhalation exposure-short term (mg/m³): 0.008 (Foundry) / 0.012 (Other Composite Material)
 Risk Characterisation Ratio inhalation-short term: 0.078 (Foundry) / 0.116 (Other Composite Material)

Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006
 Risk Characterisation Ratio inhalation-long term: 0.112
 Inhalation exposure-short term (mg/m³): 0.011
 Risk Characterisation Ratio inhalation-short term: 0.112

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

| | |
|--------------------|--|
| Environment | : Not applicable. |
| Health | : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Further information on the assumptions contained in this Exposure Scenario can be found at: http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf |

Additional good practice advice beyond the REACH CSA

| | |
|--------------------|-------------------|
| Environment | : Not applicable. |
| Health | : Not applicable. |

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Professional end uses of MDI

List of use descriptors : **Identified use name:** Professional end uses of MDI
Process Category: PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC14, PROC15, PROC21
Substance supplied to that use in form of: As such, In a mixture
Sector of end use: SU22
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08c, ERC08f

Environmental contributing scenarios : **ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC08c**
ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix - ERC08f

Health Contributing scenarios : **PROC02: Use in closed, continuous process with occasional controlled exposure - PROC02**
PROC03: Use in closed batch process (synthesis or formulation) - PROC03
PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises - PROC04
PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact) - PROC05
PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities - PROC08a
PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC08b
PROC10: Roller application or brushing - PROC10
PROC11: Non industrial spraying - PROC11
PROC13: Treatment of articles by dipping and pouring - PROC13
PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation
PROC15: Use as laboratory reagent
PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|--|--|
| Number of the ES | : Exposure Scenario Cluster 7 |
| Industry Association | : ISOPA |
| Processes and activities covered by the exposure scenario | : - Rigid foam: PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11 ERC 8c, ERC 8f - Coatings: PROC 5, PROC 8a, PROC 10, PROC 11, PROC 13 ERC 8c, ERC 8f - Adhesives and Sealants: PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 13 ERC 8c, ERC 8f - Composite Material Based on Wood/Man-made/Mineral/Natural Fibres: PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 15, PROC 21 ERC 8c, ERC 8f |

- **Other Composite Material:**
 PROC 2, PROC 3, PROC 5, PROC 8a, PROC 14
 ERC 8c, ERC 8f

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

| | |
|--|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): up to 1,120,000 (For use in Other Composite Material and Rigid foam)/ 60,000 (Sealants and adhesives and Coating.) Fraction of Regional tonnage used locally: 2.0×10^{-3} Maximum daily site tonnage (kg/day): 6,137 (For use in Other Composite Material and Rigid foam)/ 329 (Sealants and adhesives and Coating.) |
| Frequency and duration of use | : Type of release: Dispersive use. Emission Days (days/year): 365 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 0.15 Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 5.0×10^{-3} |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

| | |
|--|---|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): up to 1,120,000 (For use in Other Composite Material and Rigid foam)/ 60,000 (Sealants and adhesives and Coating.) Fraction of Regional tonnage used locally: 2.0×10^{-3} Maximum daily site tonnage (kg/day): 6,137 (For use in Other Composite Material and Rigid foam)/ 329 (Sealants and adhesives and Coating.) |
| Frequency and duration of use | : Type of release: Dispersive use. Emission Days (days/year): 365 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open systems. Dry process. Release fraction to air from process.: 0.15 Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 5.0×10^{-3} |
| Technical conditions and measures at process level (source) to prevent release | : Common practices vary across sites thus conservative process release estimates used. |
| Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil | : No air emission controls required; required removal efficiency is 0%. Soil emission controls are not applicable as there is no direct release to soil. |
| Risk management measures - Soil | : Not applicable. |
| Organisational measures to prevent/limit release from site | : Prevent discharge of undissolved substance to or recover from wastewater. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling worker exposure for: PROC02: Use in closed, continuous process with occasional controlled exposure

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |

| | |
|--|---|
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC03: Use in closed batch process (synthesis or formulation)

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

| | |
|---|--|
| Further specification | : Activities close to the former line (Composite Material Based on Wood/Man-made/Mineral/Natural Fibres): during mat dumping, sampling, maintenance, equipment cleaning, occasional intervention at open areas |
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Activities close to the former line: Provide extract ventilation to material transfer points and other openings. Minimal efficiency exhaust ventilation: 25% At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to points where emissions occur. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
 If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
 Wear a respirator conforming to EN140 with Type A filter or better.

Activities close to the former line:
 Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Contributing exposure scenario controlling worker exposure for: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100% (unless stated differently).

Physical state : liquid (only solid when specifically mentioned)

Amounts used : Not applicable.

Frequency and duration of use : Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management : None identified.

Area of use: : Indoor and outdoor use.

Ventilation control measures : **Adhesives and Sealants:**
 Provide extract ventilation to points where emissions occur.

At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances
 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:
 Provide extract ventilation to points where emissions occur.
 or
 Provide extract ventilation to material transfer points and other openings.
 or
 Handle in a fume cupboard or under extract ventilation.
 or
 demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

Advice on general occupational hygiene : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.

Personal protection : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.

if exposure may be possible:
 Wear suitable gloves tested to EN374.

Respiratory protection : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
 If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
 Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|--|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. Solid: Wear a respirator conforming to EN140 with Type A/P2 filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|--|
| Ventilation control measures | <p>At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. |
| | if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC10: Roller application or brushing

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | <p>At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.</p> |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
|---|---|

- Personal protection** : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin.
- Respiratory protection** : **if exposure may be possible:**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn.
Wear a respirator conforming to EN140 with Type A filter or better.

Contributing exposure scenario controlling worker exposure for: PROC11: Non industrial spraying

- Concentration of substance in mixture or article** : Covers percentage substance in the product up to 60%.
- Physical state** : liquid (only solid when specifically mentioned)
- Amounts used** : Not applicable.
- Frequency and duration of use** : Covers daily exposures up to 8 hours (unless stated differently).
- Human factors not influenced by risk management** : None identified.
- Area of use:** : Indoor and outdoor use.
- Ventilation control measures** : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
- At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and:**
Provide extract ventilation to material transfer points and other openings.
or
Provide extract ventilation to material transfer points and other openings.
or
Handle in a fume cupboard or under extract ventilation.
or
demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term.

Conditions and measures related to personal protection, hygiene and health evaluation

- Advice on general occupational hygiene** : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators.
- Personal protection** : **Indoor and outdoor use.**
Use suitable eye protection and gloves.
Wear suitable coveralls to prevent exposure to the skin.
or Other skin protection measures such as impervious suits and face shields will be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
- Respiratory protection** : **At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances**
Wear suitable gloves tested to EN374.
- Respiratory protection** : **Indoor and outdoor use.**
Wear a full-face respirator conforming to EN140 with Type A/P2 filter or better.

Contributing exposure scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

| | |
|---|--|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |

| | |
|--|---|
| Ventilation control measures | : Provide extract ventilation to points where emissions occur. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |
| Conditions and measures related to personal protection, hygiene and health evaluation | |
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC15: Use as laboratory reagent

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Contributing exposure scenario controlling worker exposure for: PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|---|---|
| Concentration of substance in mixture or article | : Covers percentage substance in the product up to 100% (unless stated differently). |
| Physical state | : liquid (only solid when specifically mentioned) |
| Amounts used | : Not applicable. |
| Frequency and duration of use | : Covers daily exposures up to 8 hours (unless stated differently). |
| Human factors not influenced by risk management | : None identified. |
| Area of use: | : Indoor and outdoor use. |
| Ventilation control measures | : Provide extract ventilation to points where emissions occur. At product temperatures below 40°C for pure MDI or below 45°C for other MDI based substances Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: Provide extract ventilation to material transfer points and other openings. or Provide extract ventilation to material transfer points and other openings. or Handle in a fume cupboard or under extract ventilation. or demonstrate, e.g. by workplace monitoring, that exposures are below the relevant worker DNEL values for acute and long-term. |

Conditions and measures related to personal protection, hygiene and health evaluation

| | |
|---|---|
| Advice on general occupational hygiene | : Avoid contact with skin and clothing. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Provide adequate information, instruction and training for operators. |
| Personal protection | : Use suitable eye protection and gloves. Wear suitable coveralls to prevent exposure to the skin. if exposure may be possible: Wear suitable gloves tested to EN374. |
| Respiratory protection | : At product temperatures above 40°C for pure MDI or above 45°C for other MDI based substances: Same as above, and: If technical extraction or ventilation is not possible or inadequate, respiratory protection must be worn. Wear a respirator conforming to EN140 with Type A filter or better. |

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.94×10^{-3}
Marine water (mg/l) : 5.45×10^{-4}
Agricultural soil (mg/kg) : 0.240
Grassland (mg/kg) : 0.240
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water (mg/l): $< 6.94 \times 10^{-3}$
Marine water (mg/l) : $< 5.45 \times 10^{-3}$
Agricultural soil : (mg/kg) : < 0.240
Grassland : (mg/kg) : < 0.240
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
Fresh water (mg/l) : 6.94×10^{-3}
Marine water (mg/l) : 5.45×10^{-4}
Agricultural soil (mg/kg) : 0.240
Grassland (mg/kg) : 0.240
Secondary Poisoning: Not relevant.
Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):
Fresh water (mg/l): $< 6.94 \times 10^{-3}$
Marine water (mg/l) : $< 5.45 \times 10^{-3}$
Agricultural soil : (mg/kg) : < 0.240
Grassland : (mg/kg) : < 0.240
Secondary Poisoning : Not relevant.
Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Workers: PROC02: Use in closed, continuous process with occasional controlled exposure

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.013
Risk Characterisation Ratio inhalation-long term: 0.260
Inhalation exposure-short term (mg/m³): 0.026
Risk Characterisation Ratio inhalation-short term: 0.260

Exposure estimation and reference to its source - Workers: PROC03: Use in closed batch process (synthesis or formulation)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.009 / 0.002 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-long term: 0.184 / 0.038 (Composites based on wood, etc)
 Inhalation exposure-short term (mg/m³): 0.018 / 0.004 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-short term: 0.184 / 0.038 (Composites based on wood, etc)

Exposure estimation and reference to its source - Workers: PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.006 / 0.011 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-long term: 0.116 / 0.227 (Composites based on wood, etc)
 Inhalation exposure-short term (mg/m³): 0.012 / 0.023 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-short term: 0.116 / 0.227 (Composites based on wood, etc)

Exposure estimation and reference to its source - Workers: PROC05: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029 / 0.012 (enclosed)
 Risk Characterisation Ratio inhalation-long term: 0.582 / 0.246 (enclosed)
 Inhalation exposure-short term (mg/m³): 0.058 / 0.025 (enclosed)
 Risk Characterisation Ratio inhalation-short term: 0.582 / 0.246 (enclosed)

Exposure estimation and reference to its source - Workers: PROC08a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029
 Risk Characterisation Ratio inhalation-long term: 0.582
 Inhalation exposure-short term (mg/m³): 0.058
 Risk Characterisation Ratio inhalation-short term: 0.582

Exposure estimation and reference to its source - Workers: PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.029 / 0.002 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-long term: 0.582 / 0.034 (Composites based on wood, etc)
 Inhalation exposure-short term (mg/m³): 0.058 / 0.003 (Composites based on wood, etc)
 Risk Characterisation Ratio inhalation-short term: 0.582 / 0.034 (Composites based on wood, etc)

Exposure estimation and reference to its source - Workers: PROC10: Roller application or brushing

Exposure assessment (human): : Measured data has been used to estimate worker exposure.

Exposure estimation : Inhalation exposure-long term (mg/m³): 0.017
 Risk Characterisation Ratio inhalation-long term: 0.328
 Inhalation exposure-short term (mg/m³): 0.034
 Risk Characterisation Ratio inhalation-short term: 0.328

Exposure estimation and reference to its source - Workers: PROC11: Non industrial spraying

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.04 (Indoor.); 0.043 (Outdoor.) Risk Characterisation Ratio inhalation-long term: 0.80 (Indoor.); 0.87 (Outdoor.) Inhalation exposure-short term (mg/m ³): 0.08 (Indoor.); 0.087 (Outdoor.) Risk Characterisation Ratio inhalation-short term: 0.80 (Indoor.); 0.87 (Outdoor.) |

Exposure estimation and reference to its source - Workers: PROC13: Treatment of articles by dipping and pouring

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.017 Risk Characterisation Ratio inhalation-long term: 0.344 Inhalation exposure-short term (mg/m ³): 0.034 Risk Characterisation Ratio inhalation-short term: 0.344 |

Exposure estimation and reference to its source - Workers: PROC14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.006 Risk Characterisation Ratio inhalation-long term: 0.116 Inhalation exposure-short term (mg/m ³): 0.012 Risk Characterisation Ratio inhalation-short term: 0.116 |

Exposure estimation and reference to its source - Workers: PROC15: Use as laboratory reagent

| | |
|-------------------------------------|--|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.006 Risk Characterisation Ratio inhalation-long term: 0.112 Inhalation exposure-short term (mg/m ³): 0.011 Risk Characterisation Ratio inhalation-short term: 0.112 |

Exposure estimation and reference to its source - Workers: PROC21: Low energy manipulation of substances bound in materials and/or articles

| | |
|-------------------------------------|---|
| Exposure assessment (human): | : Measured data has been used to estimate worker exposure. |
| Exposure estimation | : Inhalation exposure-long term (mg/m ³): 0.0004 Risk Characterisation Ratio inhalation-long term: 0.008 Inhalation exposure-short term (mg/m ³): 0.001 Risk Characterisation Ratio inhalation-short term: 0.008 |

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

| | |
|--------------------|---|
| Environment | : Not applicable. |
| Health | : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Further information on the assumptions contained in this Exposure Scenario can be found at: http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf |

Additional good practice advice beyond the REACH CSA

| | |
|--------------------|-------------------|
| Environment | : Not applicable. |
| Health | : Not applicable. |

Annex to the extended Safety Data Sheet (eSDS)

Consumer

Identification of the substance or mixture

Product definition : Mixture
Code : 00012289
Product name : SUPRASEC® 2496

Section 1 - Title

Short title of the exposure scenario : Consumer end uses of MDI

List of use descriptors : **Identified use name:** Consumer end uses of MDI
Sector of end use: SU21
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC08c, ERC08f
Market sector by type of chemical product: PC01, PC09a, PC32

Environmental contributing scenarios : **ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix - ERC08c**
ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix - ERC08f

Health Contributing scenarios : **PC01: Adhesives, sealants - PC01**
PC09a: Coatings and paints, thinners, paint removers - PC09a
PC32 : Rigid, insulation foams - PC32

Number of the ES : Exposure Scenario Cluster 8
Industry Association : ISOPA
Processes and activities covered by the exposure scenario : Rigid foam, coatings, adhesives and sealants.

Section 2 - Exposure controls

Contributing exposure scenario controlling environmental exposure for: ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

Further specification : Same for all ERC

Product Characteristics : Substance is a unique structure or Substance is complex UVCB
Predominantly hydrophobic
Not biodegradable

Amounts used : Fraction of EU tonnage used in region: 1
Regional use tonnage (tonnes/year):
- Rigid foam: up to 1,120,000
- Coatings and Adhesives and sealants.: 60,000
Fraction of Regional tonnage used locally: 2.0x10-3
Maximum daily site tonnage (kg/day):
- Rigid foam: 6,137
- Coatings and Adhesives and sealants.: 329

Frequency and duration of use : Type of release: Dispersive use.
Emission Days (days/year): 365

Environmental factors not influenced by risk management : Local freshwater dilution factor: 10
Local marine water dilution factor: 100

| | |
|--|--|
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open and closed systems. Dry processes. Release fraction to air from process.: 0.15 Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 5.0x10 ⁻³ Common practices vary across sites thus conservative process release estimates used. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling environmental exposure for: ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

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|--|--|
| Further specification | : Same for all ERC |
| Product Characteristics | : Substance is a unique structure or Substance is complex UVCB Predominantly hydrophobic Not biodegradable |
| Amounts used | : Fraction of EU tonnage used in region: 1 Regional use tonnage (tonnes/year): - Rigid foam: up to 1,120,000 - Coatings and Adhesives and sealants.: 60,000 Fraction of Regional tonnage used locally: 2.0x10 ⁻³ Maximum daily site tonnage (kg/day): - Rigid foam: 6,137 - Coatings and Adhesives and sealants.: 329 |
| Frequency and duration of use | : Type of release: Dispersive use. Emission Days (days/year): 365 |
| Environmental factors not influenced by risk management | : Local freshwater dilution factor: 10 Local marine water dilution factor: 100 |
| Other operational conditions of use affecting environmental exposure | : Indoor/Outdoor use. Used in open and closed systems. Dry processes. Release fraction to air from process.: 0.15 Release fraction to wastewater from process.: 0 Release fraction to soil from process (regional only): 5.0x10 ⁻³ Common practices vary across sites thus conservative process release estimates used. |
| Conditions and measures related to municipal sewage treatment plant | : Wastewater emission controls are not applicable as there is no direct release to wastewater. |
| Conditions and measures related to external treatment of waste for disposal | : Not applicable. |
| Conditions and measures related to external recovery of waste | : Not applicable. |

Contributing exposure scenario controlling consumer exposure for: PC01: Adhesives, sealants

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|---|--|
| Further specification | : Sub-scenario(s): 1- Adhesives and sealants, sealant joint 2- Adhesives and sealants, sealant assembly 3- Adhesives and sealants, adhesive hotmelt |
| Concentration of substance in mixture or article | : Covers concentrations up to: 1- Adhesives and sealants, sealant joint: 2% 2- Adhesives and sealants, sealant assembly: 2% |
| Amounts used | : For each use event, covers use amounts up to: 1- Adhesives and sealants, sealant joint: 75 g 2- Adhesives and sealants, sealant assembly: 390 g 3- Adhesives and sealants, adhesive hotmelt: 65 g |
| Frequency and duration of use | : For each use event, covers exposure up to: 1- Adhesives and sealants, sealant joint: 45 minutes/event 2- Adhesives and sealants, sealant assembly: 4 hr/ event (ed. Hours per event) 3- Adhesives and sealants, adhesive hotmelt: 25 minutes/event |
| Other given operational conditions affecting consumers exposure | : Covers skin contact area up to: 1- Adhesives and sealants, sealant joint: 2 cm ² 2- Adhesives and sealants, sealant assembly: 43 cm ² 3- Adhesives and sealants, adhesive hotmelt: 43 cm ² |
| Area of use: | : Covers use in room size of: 1- Adhesives and sealants, sealant joint: 10 m ³ 2- Adhesives and sealants, sealant assembly: 20 m ³ 3- Adhesives and sealants, adhesive hotmelt: 20 m ³ |
| Conditions and measures related to information and behavioural advice to consumers | : Avoid using without gloves. |

Conditions and measures related to personal protection, hygiene and health evaluation**Contributing exposure scenario controlling consumer exposure for: PC09a: Coatings and paints, thinners, paint removers**

| | |
|---|---|
| Further specification | : Sub-scenario(s): 1- Use of 2-component paint, solvent rich 2- Use of 2-component paint, high solid 3- Mixing and loading of 2-component solvent rich paint 4- Mixing and loading of 2-component high solid paint 5- Floor coating high solid |
| Concentration of substance in mixture or article | : Covers concentrations up to: 1- Use of 2-component paint, solvent rich: 30% 2- Use of 2-component paint, high solid: 30% 3- Mixing and loading of 2-component solvent rich paint: 100% 4- Mixing and loading of 2-component high solid paint: 100% 5- Floor coating high solid: 10% |
| Amounts used | : For each use event, covers use amounts up to: 1- Use of 2-component paint, solvent rich: 150 g 2- Use of 2-component paint, high solid: 195 g 3- Mixing and loading of 2-component solvent rich paint: 150 g 4- Mixing and loading of 2-component high solid paint: 195 g 5- Floor coating high solid: 3000 g |
| Frequency and duration of use | : For each use event, covers exposure up to: 1- Use of 2-component paint, solvent rich: 2 hr/ event (ed. Hours per event) 2- Use of 2-component paint, high solid: 0.5 hr/ event (ed. Hours per event) 3- Mixing and loading of 2-component solvent rich paint: 5 minutes/event 4- Mixing and loading of 2-component high solid paint: 5 minutes/event 5- Floor coating high solid: 1 hr/ event (ed. Hours per event) |

Area of use: : **Covers use in room size of:**
 1- Use of 2-component paint, solvent rich: 20 m³
 2- Use of 2-component paint, high solid: 20 m³
 3- Mixing and loading of 2-component solvent rich paint: Not available.
 4- Mixing and loading of 2-component high solid paint: Not available.
 5- Floor coating high solid: 34 m³

Sub-scenario(s) 1; 2; 5 : Avoid using when windows closed.

Conditions and measures related to information and behavioural advice to consumers : Avoid using without gloves.

Conditions and measures related to personal protection, hygiene and health evaluation

Contributing exposure scenario controlling consumer exposure for: PC32 : Rigids, insulation foams

Amounts used : For each use event, covers use amounts up to 825 g.

Frequency and duration of use :
 - Covers use up to 1 days/year
 - For each use event, covers exposure up to 0.5 hr/ event (ed. Hours per event).

Area of use: : Covers use in room size of: 57.5 m³

Conditions and measures related to information and behavioural advice to consumers : Avoid using without gloves.

Conditions and measures related to personal protection, hygiene and health evaluation

Section 3 - Exposure estimation and reference to its source

Website: : <http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApotionUseDescriptor.pdf>

Exposure estimation and reference to its source - Environment: ERC08c: Wide dispersive indoor use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
 Fresh water (mg/l) : 6.94x10⁻³
 Marine water (mg/l) : 5.45x10⁻⁴
 Agricultural soil (mg/kg) : 0.240
 Grassland (mg/kg) : 0.240
 Secondary Poisoning: Not relevant.
 Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):

Fresh water(mg/l): < 6.94x10⁻³
 Marine water (mg/l) : < 5.45x10⁻³
 Agricultural soil :(mg/kg) : < 0.240
 Grassland : (mg/kg) : < 0.240
 Secondary Poisoning : Not relevant.
 Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Environment: ERC08f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Exposure assessment (environment): : Same for all ERC
Used EUSES model.

Exposure estimation : Predicted Environmental Concentration :
 Fresh water (mg/l) : 6.94x10⁻³
 Marine water (mg/l) : 5.45x10⁻⁴
 Agricultural soil (mg/kg) : 0.240
 Grassland (mg/kg) : 0.240
 Secondary Poisoning: Not relevant.
 Humans exposed via the environment : Not relevant.

Risk characterisation ratio (PEC/PNEC):

Fresh water(mg/l): < 6.94x10⁻³

Marine water (mg/l) : < 5.45x10⁻³
 Agricultural soil : (mg/kg) : < 0.240
 Grassland : (mg/kg) : < 0.240
 Secondary Poisoning : Not relevant.
 Humans exposed via the environment : Not relevant.

Exposure estimation and reference to its source - Consumers: PC01: Adhesives, sealants

Exposure assessment (human): : The Consexpo model has been used to estimate consumer exposures unless otherwise indicated.

Exposure estimation : **Adhesives and sealants, sealant joint:**
 Inhalation exposure (mg/m³/day): 2.31x10⁻⁵
 Risk Characterisation Ratio chronic: < 0.01
 Inhalation exposure (event) (mg/m³/day): 7.39x10⁻⁴
 Risk Characterisation Ratio Acute: 0.01

Adhesives and sealants, sealant assembly:
 Inhalation exposure (mg/m³/day): 0.01
 Risk Characterisation Ratio chronic: 0.30
 Inhalation exposure (event) (mg/m³/day): 4.02x10⁻²
 Risk Characterisation Ratio Acute: 0.90

Adhesives and sealants, adhesive hotmelt
 Inhalation exposure (mg/m³/day): 6.94x10⁻⁷
 Risk Characterisation Ratio chronic: < 0.01
 Inhalation exposure (event) (mg/m³/day): 4.00x10⁻⁵
 Risk Characterisation Ratio Acute: < 0.01

Exposure estimation and reference to its source - Consumers: PC09a: Coatings and paints, thinners, paint removers

Exposure assessment (human): : The Consexpo model has been used to estimate consumer exposures unless otherwise indicated.

Exposure estimation : **Use of 2-component paint, solvent rich:**
 Inhalation exposure (mg/m³/day): 3.72x10⁻³
 Risk Characterisation Ratio chronic: 0.15
 Inhalation exposure (event) (mg/m³/day): 4.06x10⁻²
 Risk Characterisation Ratio Acute: 0.81

**Mixing and loading of 2-component solvent rich paint,
 Mixing and loading of 2-component high solid paint:**
 Inhalation exposure (mg/m³/day): 1.92x10⁻⁷
 Risk Characterisation Ratio chronic: < 0.01
 Inhalation exposure (mg/m³/day): 5.52x10⁻⁵
 Risk Characterisation Ratio Acute: < 0.01

Floor coating high solid:
 Inhalation exposure (mg/m³/day): 1.39x10⁻³
 Risk Characterisation Ratio chronic: 0.06
 Inhalation exposure (event) (mg/m³/day): 3.02x10⁻²
 Risk Characterisation Ratio Acute: 0.67

Use of 2-component paint, high solvent
 Inhalation exposure (mg/m³/day): 8.22x10⁻⁴
 Risk Characterisation Ratio chronic: 0.03
 Inhalation exposure (event) (mg/m³/day): 3.7x10⁻²
 Risk Characterisation Ratio Acute: 0.74

Exposure estimation and reference to its source - Consumers: PC32 : Rigids, insulation foams

Exposure assessment (human): : The Consexpo model has been used to estimate consumer exposures unless otherwise indicated.

Exposure estimation : Inhalation exposure (mg/m³/day): 2.54x10⁻⁵
 Risk Characterisation Ratio chronic: < 0.01
 Inhalation exposure (event) (mg/m³/day): 1.22x10⁻³
 Risk Characterisation Ratio Acute: 0.02

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

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|--------------------|---|
| Environment | : Not applicable. |
| Health | : Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Further information on the assumptions contained in this Exposure Scenario can be found at: http://www.isopa.org/isopa/uploads/Documents/documents/ISOPApositionUseDescriptor.pdf |

Additional good practice advice beyond the REACH CSA

| | |
|--------------------|-------------------|
| Environment | : Not applicable. |
| Health | : Not applicable. |