

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

1.1 Product identifier

Product name : EuroFoam 0117 Part B
Product code : 00007195
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

1.3 Details of the supplier of the safety data sheet

Supplier : Europol
 9 Birchills Trading Estate
 Emery Road
 Brislington
 Bristol
 BS4 5PF
 UNITED KINGDOM

e-mail address of person responsible for this SDS : sales@europoluk.com

1.4 Emergency telephone number

Supplier

Telephone number : +44 (0) 117 9715500 (during office hours only)

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]

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

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

SECTION 2: Hazards identification

- 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** : 4,4'-Methylenediphenyl diisocyanate
- Supplemental label elements** : Contains isocyanates. May produce an allergic reaction.

Special packaging requirements

- Containers to be fitted with child-resistant fastenings** : Not applicable.
- Tactile warning of danger** : Not applicable.

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 2: Hazards identification

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]	
4,4'-Methylenediphenyl diisocyanate	CAS: 101-68-8 EC: 202-966-0 RRN: 01-2119457014-47	30-60	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] [2]
Isocyanic acid, polymethylenepolyphenylene ester	CAS: 9016-87-9 EC: Polymer	30-60	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]
Methyloxirane, polymer with oxirane, ether with 1,2,3-propanetriol, polymer with 1,1'-methylenebis[isocyanatobenzene]	CAS: 112898-48-3 EC: Polymer	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]
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	CAS: 157937-75-2 EC: Polymer	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]

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 3: Composition/information on ingredients

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	CAS: Not available. EC: Not available. RRN: 01-2119457015-45	3-7	Carc. Cat. 3; R40 Xn; R20, R48/20 Xi; R36/37/38 R42/43 See Section 16 for the full text of the R-phrases declared above.	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 See Section 16 for the full text of the H statements declared above.	[1]
--	--	-----	---	--	-----

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

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

Occupational exposure limits, if available, are listed in Section 8.

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.

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

SECTION 4: First aid measures

- 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
- 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.

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

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 spilled 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".

- 6.2 Environmental precautions** : Avoid dispersal of spilled 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.

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities : Store between the following temperatures: 16 to 38°C (60.8 to 100.4°F). 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)

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
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).
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).
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
4,4'-Methylenediphenyl diisocyanate	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

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 8: Exposure controls/personal protection

Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	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 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
	DNEL	Long term Inhalation	0.025 mg/m ³	Consumers	Local

Predicted effect concentrations

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
4,4'-Methylenediphenyl diisocyanate	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
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

8.2 Exposure controls

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

SECTION 8: Exposure controls/personal protection

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.

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.

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

SECTION 8: Exposure controls/personal protection

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	: Brown.
Odour	: slightly musty
Odour threshold	: Not available.
pH	: Not applicable.
Melting point/freezing point	: Not available.
Initial boiling point and boiling range	: Not available.
Flash point	: Closed cup: 190°C Open cup: 190°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	: 1.18
Solubility(ies)	
Water solubility	:

Other

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: 250 mPa·s 25 deg C

Explosive properties : Not available.

Oxidising properties : Not available.

9.2 Other information

Density : 1.18 g/cm³ [25°C (77°F)]

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

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 CO₂-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, CO₂) , nitrogen oxides (NO, NO₂ etc.) , hydrocarbons , HCN.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Endpoint	Species	Result	Exposure
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	-
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	-
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	LC50 Inhalation Dusts and mists	Rat	0.49 mg/L	4 hours
	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg	-
	LD50 Intraperitoneal	Rabbit - Male	100 mg/kg	-
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	LD50 Oral	Rat - Male	>10000 mg/kg	-
	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	-

Acute toxicity estimates

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 11: Toxicological information

Route	ATE value
Inhalation (dusts and mists)	1.649 mg/l

Irritation/Corrosion

Product/ingredient name	Test	Species	Route of exposure	Result
4,4'-Methylenediphenyl diisocyanate	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin	Irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes	Non-irritant.
Isocyanic acid, polymethylenepolyphenylene ester	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin	Mild irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes	Non-irritant.
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin	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.

Conclusion/Summary

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

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

Respiratory : No additional information.

Sensitiser

Product/ingredient name	Test	Route of exposure	Species	Result

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 11: Toxicological information

4,4'-Methylenediphenyl diisocyanate	OECD 429 Skin Sensitisation: Local Lymph Node Assay	skin	Mouse	Sensitising
	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitising
Isocyanic acid, polymethylenepolyphenylene ester	OECD 429 Skin Sensitisation: Local Lymph Node Assay	skin	Mouse	Sensitising
	No official guidelines	Respiratory	Guinea pig	Sensitising
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	-	skin	Mouse	Sensitising
	No official guidelines	Respiratory	Guinea pig	Sensitising
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	-	skin	Mouse	Sensitising
	No official guidelines	Respiratory	Guinea pig	Sensitising

Conclusion/Summary : No additional information.

Mutagenicity

Product/ingredient name	Test	Result
4,4'-Methylenediphenyl diisocyanate	EU EC B.13/14 Mutagenicity - Reverse Mutation Test using Bacteria	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative
Isocyanic acid, polymethylenepolyphenylene ester	OECD 474	Negative
	-	Equivocal
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	EU EC B.13/14 Mutagenicity - Reverse Mutation Test using Bacteria	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative
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

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

Carcinogenicity

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 11: Toxicological information

Product/ingredient name	Test	Species	Exposure	Result	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate	OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies	Rat	2 years; 5 days per week	Positive	Inhalation	lungs
Isocyanic acid, polymethylenepolyphenylene ester	OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies EU	Rat	2 years; 5 days per week	Negative	Inhalation	-
		Rat	2 years; 5 days per week	Negative	Inhalation	-
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies	Rat	2 years; 5 days per week	Positive	Inhalation	lungs
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

Reproductive toxicity

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

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
4,4'-Methylenediphenyl diisocyanate	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	12 mg/m3 NOAEL
Isocyanic acid, polymethylenepolyphenylene ester	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	12 mg/m3 NOAEL
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, 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

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

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate	Category 3	Inhalation	Respiratory tract irritation
Isocyanic acid, polymethylenepolyphenylene ester	Category 3	Inhalation	Respiratory tract irritation
Methyloxirane, polymer with oxirane, ether with 1,2,3-propanetriol, polymer with 1,1'-methylenebis[isocyanatobenzene]	Category 3	Inhalation	Respiratory tract irritation
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and	Category 3	Inhalation	Respiratory tract irritation

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 11: Toxicological information

oxirane Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Category 3	Inhalation	Respiratory tract irritation
---	------------	------------	------------------------------

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4,4'-Methylenediphenyl diisocyanate	Category 2	Inhalation	respiratory tract
Isocyanic acid, polymethylenepolyphenylene ester	Category 2	Inhalation	respiratory tract
Methyloxirane, polymer with oxirane, ether with 1,2,3-propanetriol, polymer with 1,1'-methylenebis[isocyanatobenzene]	Category 2	Inhalation	respiratory tract
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	Category 2	Inhalation	respiratory tract
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Category 2	Inhalation	respiratory tract

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

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

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 11: Toxicological information

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/m3	-
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies	NOEC Dusts and mists	0.2 mg/m3	-

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.

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 : 4,4'-Methylenediphenyl diisocyanate 3
 Isocyanic acid, polymethylenepolyphenylene ester 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

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 12: Ecological information

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 Semi-static	Daphnia	>10	mg/L
Isocyanic acid, polymethylenepolyphenylene ester	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/L
	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
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	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
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/L
	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
	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

12.2 Persistence and degradability

Product/ingredient name	Test	Period	Result
4,4'-Methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
Isocyanic acid, polymethylenepolyphenylene ester	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 12: Ecological information

with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	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
4,4'-Methylenediphenyl diisocyanate	Fresh water 0.83 days	-	Not readily
Isocyanic acid, polymethylenepolyphenylene ester	Fresh water 0.8 days	-	Not readily
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	-	-	Not readily
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
4,4'-Methylenediphenyl diisocyanate	4.51	200	high
Isocyanic acid, polymethylenepolyphenylene ester	-	200	high
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	4.51	200	high
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	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.

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

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 spill 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.	-

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

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
4,4'-methylenediphenyl diisocyanate	Carc. 2, H351	-	-	-
Isocyanic acid, polymethylenepolyphenylene ester	Carc. 2, H351	-	-	-
Methyloxirane, polymer with oxirane, ether with 1,2,3-propanetriol, polymer with 1,1'-methylenebis[isocyanatobenzene]	Carc. 2, H351	-	-	-
Methyloxirane, polymer with oxirane, ether with oxybis(propanol), polymer with 1,1'-methylenebis(isocyanatobenzene), methyloxirane and oxirane	Carc. 2, H351	-	-	-
Reaction mass of 4,4'-methylenediphenyl diisocyanate and o-(p-isocyanatobenzyl)phenyl isocyanate	Carc. 2, H351	-	-	-

National regulations

Date of printing : 18 July 2012 **MSDS no.** : 00007195
Date of issue : 16 July 2012 **Version** : 6

SECTION 15: Regulatory information

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

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

Date of printing	: 18 July 2012	MSDS no.	: 00007195
Date of issue	: 16 July 2012	Version	: 6

SECTION 16: Other information

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.

Full text of classifications [DSD/DPD] : Carc. Cat. 3 - Carcinogen category 3
 Xn - Harmful
 Xi - Irritant

MSDS no. : 00007195

Date of printing : 7/18/2012.

Date of issue/ Date of revision : 7/16/2012.

Date of previous issue :

Version : 6

Notice to reader

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

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.

Identification of the substance or mixture

Product definition : Mixture
Code : 00007195
Product name : XXXXX

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
Date of issue/Date of revision	: ES Revision date)

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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.

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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.

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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 : 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 - 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.

Use of MDI for Manufacturing of other Substances and Formulation (including Resin Manufacture), Repackaging and Distribution

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.

Identification of the substance or mixture

Product definition : Mixture
Code : 00007195
Product name :

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
Date of issue/Date of revision : ES Revision date)	

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

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.: 1.2×10^{-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.
- 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.

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 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 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

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

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.

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): 0.029 (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.

**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/ISOPApositionUseDescriptor.pdf>

Additional good practice advice beyond the REACH CSA

Environment : Not applicable.
Health : Not applicable.