PROMAPAINT® SC3

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Revision date: 9/6/2023 Supersedes version of: 3/13/2023 Version: 7.0

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

1.1. Product identifier

Product form	:	Mixture
Product name	:	PROMAPAINT® SC3
UFI	:	739W-3168-J30T-HPAS
Type of product	:	Water based intumescent coating for the fire protection of structural steel.
Product group	:	Trade product

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

1.2.1. Relevant identified uses

Main use category	:	Professional use
Industrial/Professional use spec	:	For professional use only
Use of the substance/mixture	:	Fire protection in buildings.

1.2.2. Uses advised against

No additional information available.

1.3. Details of the supplier of the safety data sheet

Supplier
Promat S.p.A.
Via Provinciale 10
IT– 24040 Filago (BG)
ITALY
T +39 035 99 37 37 - F +39 035 39 42 40
industria@promat.it - www.promat.com/industry

Other
Etex Building Performance S.p.A.
Via Perlasca 14
IT– 27010 Vellezzo Bellini (PV)
ITALY
T +39 0382 4575 251 - F +39 0382 4575 250
info@promat.it - www.promat.it

Other
Promat UK Limited Ltd
B1 The Innovation Centre, Pilsworth Road - Heywood Distribution Park
Pilsworth Road
GB– OL10 2TS Heywood
UNITED KINGDOM
T +44 (0)800 588 4444
sales@promat.co.uk

Other
Etex Building Performance Limited
Gordano House, Marsh Lane, Easton-in-Gordano Eastern Road
GB– BS20 0NE Bristol – Berkshire
UNITED KINGDOM
T +44 (0800) 373 636
marketinguk@promat.co.uk - www.promat.co.uk

Other
Etex Building Performance N.V.
Bormstraat 24
BE– 2830 Tisselt
BELGIUM
T +32 15 71 81 00 - F +32 15 71 81 09
info@promat-international.com - www.promat-international.com

Other
Etex France Building Performance S.A.
500 rue Marcel Demonque, Agroparc - CS70088
FR– 84915 Avignon Cedex 9
FRANCE
T +33 (0)432 44 44 44
fds.efbp@etexgroup.com - www.promat.fr

Other
Etex Building Performance GmbH
Scheifenkamp 16
DE– 40878 Ratingen
GERMANY
T +49 (0)2102 493 0 - F +49 (0)2102 493 111
mail@promat.de - www.promat.de

Other
Etex Building Performance GmbH
St.-Peter-Straße 25
AT– 4021 Linz
AUSTRIA
T +43 732 6912 0
info.at@etexgroup.com - www.promat.at

Other
Etex Nordic A/S
Vendersgade 74,3
DK– 7000 Fredericia
DENMARK
T +45 7366 1999
Promat-dk@etexgroup.com - www.promat.com/da-dk

Other
Etex Poland sp. z o.o.
ul. Przeclawska 8
PL– 03-879 Warszawa
POLAND
T +48-22 212 2280
top@promattop.pl - www.promat.com

Other
Promat s.r.o.
Evropská 11/2758
CZ– 16000 Praha 6 - Dejvice
CZECH REPUBLIC
T +420 224 390 811
promat.praha@etexgroup.com - www.promatpraha.cz

Other
Promat Ibérica S.A.
C/ Velazquez, 47 – 6° Izquierda
ES– 28001 Madrid
SPAIN
T +34 91 781 1550 - F +34 91 575 15 97
info@promat.es - www.promat.es

Other
Promat d.o.o.
Trata 50
SI– 4220 Skofja Loka
SLOVENIA
T +386 4 51 51 451 - F +386 4 51 51 450
info@promat-see.com - www.promat-see.com

Other
Promat AG
Industriestrasse 3
CH– 9542 Münchwilen
SWITZERLAND
T +41 52 320 9400 - F +41 52 320 9402
office@promat.ch - www.promat.ch

Other
Etex Middle East LLC
Plot No. 597-921 Dubai Investment Park 2
AE– 123945 Dubai
UNITED ARAB EMIRATES
T +971 4 885 3070 - F +971 4 885 3588
info@promatfp.ae - www.promat.com

Other
Promat Fire & Insulation Private Limited
Global Business Park Unit No. 605, 6th Floor, Tower B, Mehrauli Gurgaon Road, Sector 26, Gurgaon
IN– 122002 Haryana
INDIA
T +91 124 434 6865
promatindia@etexgroup.com - www.promat.com/en/industry

1.4. Emergency telephone number

Emergency number : Please contact a regional poison center or emergency telephone number.

Country	Organisation/Company	Address	Emergency number	Comment
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)	
Malta	Medicines & Poisons Info Office	Mater Dei Hospital Msida MSD 2090 Msida	+356 2545 6508	
United Kingdom	NHS 111/NHS 24/NHS Direct		111 0845 4647	or call a doctor

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Carcinogenicity, Category 2	H351
Reproductive toxicity, Category 2	H361f

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

Suspected of damaging fertility.

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS08

Signal word (CLP) : Warning

Contains : 1,3,5-triazine-2,4,6-triamine; melamine

Hazard statements (CLP) : H351 - Suspected of causing cancer.
H361f - Suspected of damaging fertility.

Precautionary statements (CLP) : P201 - Obtain special instructions before use.
P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P308+P313 - IF exposed or concerned: Get medical advice/attention.

EUH-statements : EUH211 - Warning! Hazardous respirable droplets may be formed when sprayed. Do not breathe spray or mist.
EUH208 - Contains reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7], and 2-methyl-2H -isothiazol-3-one [EC no. 220-239-6] (3:1)(55965-84-9). May produce an allergic reaction.

Extra phrases : Contains a 3:1 mixture of 5-chloro-2-methyl-2H-isothiazo-3-one and 2-Methyl-2H-isothiazol-3-one as active substance for storage protection according to Biocidal Products Regulation (EU) No 528/2012 Art. 58(3).

2.3. Other hazards

Other hazards which do not result in classification : In normal use, it is expected that this product represents a minimal hazard.

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

Component	
1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

Component	
1,3,5-triazine-2,4,6-triamine; melamine(108-78-1)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Not established.

3.2. Mixtures

Comments : Mixture of the substances listed below with harmless additives

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
titanium dioxide substance with national workplace exposure limit(s) (IE, GB)	CAS-No.: 13463-67-7 EC-No.: 236-675-5 REACH-no: 01-2119489379-17	≥ 10 - < 25	Not classified
1,3,5-triazine-2,4,6-triamine; melamine substance listed as REACH Candidate	CAS-No.: 108-78-1 EC-No.: 203-615-4 EC Index-No.: 613-345-00-2	≥ 5 - < 10	Carc. 2, H351 Repr. 2, H361f STOT RE 2, H373

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Pentaerythritol substance with national workplace exposure limit(s) (IE, GB)	CAS-No.: 115-77-5 EC-No.: 204-104-9 REACH-no: 01-2119473985-20	≥ 5 - < 10	Not classified
Reaction mass of 2-methyl-2H-isothiazol-3-one and 5-chloro-2-methyl-2H-isothiazol-3-one	CAS-No.: 55965-84-9 EC Index-No.: 613-167-00-5	< 0,0015	Acute Tox. 2 (Inhalation), H330 Acute Tox. 2 (Dermal), H310 Acute Tox. 3 (Oral), H301 Skin Corr. 1C, H314 Eye Dam. 1, H318 Skin Sens. 1A, H317 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410 (M=100)

Specific concentration limits:		
Name	**Product identifier**	**Specific concentration limits**
Reaction mass of 2-methyl-2H-isothiazol-3-one and 5-chloro-2-methyl-2H-isothiazol-3-one	CAS-No.: 55965-84-9 EC Index-No.: 613-167-00-5	(0.0015 ≤ C ≤ 100) Skin Sens. 1A, H317 (0.06 ≤ C < 0.6) Skin Irrit. 2, H315 (0.06 ≤ C < 0.6) Eye Irrit. 2, H319 (0.6 ≤ C ≤ 100) Eye Dam. 1, H318 (0.6 ≤ C ≤ 100) Skin Corr. 1C, H314

Comments : The contained titanium dioxide is not classified according to Regulation 2020/217 (14th ATP of Regulation (EC) 1272/2008, Annex VI). EUH 211 is listed in section 2.2 on a voluntary basis.

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Not required for normal conditions of use.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Remove contaminated clothing. Wash skin with plenty of water and soap. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

First-aid measures after eye contact : Do not rub the eye. Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Rinse mouth thoroughly, drink plenty of water. If symptoms persist, consult a doctor.

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

Symptoms/effects : Not expected to present a significant hazard under anticipated conditions of normal use. In normal conditions of use, the components cannot be released because of the form in which the article or preparation is placed on the market.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

Fire hazard	:	Not flammable.
Reactivity in case of fire	:	The product is water based and is not combustible.
Hazardous decomposition products in case of fire	:	Hazardous decomposition products may be released during prolonged heating like smokes, carbon monoxide and dioxide. Do not breathe fumes from fires or vapours from decomposition.

5.3. Advice for firefighters

Precautionary measures fire	:	Exercise caution when fighting any chemical fire.
Firefighting instructions	:	Use water spray or fog for cooling exposed containers.
Protection during firefighting	:	Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Avoid contact with skin and eyes. Do not breathe gas, fumes, vapour or spray. Spill area may be slippery.

6.1.1. For non-emergency personnel

Protective equipment	:	Wear recommended personal protective equipment.
Emergency procedures	:	Ventilate spillage area.

6.1.2. For emergency responders

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

6.2. Environmental precautions

Do not allow entry to drains, sewers, water courses or soil.

6.3. Methods and material for containment and cleaning up

For containment	:	For a large spillage, contain the spillage by bunding.
Methods for cleaning up	:	Remove with inert absorbent material (e.g. sand, sawdust, vermiculite, diatomeous earth, etc.), wipe up and keep in suitable containers for disposal. Notify authorities if product enters sewers or public waters.
Other information	:	Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

See sections 7, 8 and 11. For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	:	Spray application of a coating system typically requires respiratory protection to prevent from inhalation of paint aerosols as well as from volatile and non-volatile (e.g. pigments, fillers) paint components, independent from the nature of the coatings system. Spray application requires improved respiratory protection by using at least a combination filter A/P2 or A/P3 or a supplied air system, depending on the extend of spray operation duration of spraying, extend of aerosol formation, etc. Avoid contact with skin and eyes. Avoid all unnecessary exposure. Ensure prompt removal from eyes, skin and clothing.
Precautions for safe handling	:	Ensure good ventilation of the work station. Wear personal protective equipment. Avoid all unnecessary exposure. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Handling temperature	:	≥ 5 °C

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry, cool and well-ventilated place. Store between +5°C and +40°C, protected from frost and direct sunlight. Keep container closed when not in use. Store locked up.

Storage temperature : 5 – 40 °C

7.3. Specific end use(s)

Fire protection in buildings.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

titanium dioxide (13463-67-7)	
Ireland - Occupational Exposure Limits	
Local name	Titanium dioxide
OEL TWA [1]	10 mg/m³ total inhalable dust 4 mg/m³ respirable dust
Regulatory reference	Chemical Agents Code of Practice 2021
United Kingdom - Occupational Exposure Limits	
Local name	Titanium dioxide
WEL TWA (OEL TWA) [1]	4 mg/m³ respirable 10 mg/m³ total inhalable
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

Pentaerythritol (115-77-5)	
Ireland - Occupational Exposure Limits	
Local name	Pentaerythritol
OEL TWA [1]	4 mg/m³ respirable dust 10 mg/m³ total inhalable dust
OEL STEL	20 mg/m³ total inhalable dust
Regulatory reference	Chemical Agents Code of Practice 2021
United Kingdom - Occupational Exposure Limits	
Local name	Pentaerythritol
WEL TWA (OEL TWA) [1]	4 mg/m³ respirable dust 10 mg/m³ inhalable dust
WEL STEL (OEL STEL)	20 mg/m³ inhalable dust
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

8.1.2. Recommended monitoring procedures

No additional information available.

8.1.3. Air contaminants formed

No additional information available.

8.1.4. DNEL and PNEC

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	117 mg/kg bodyweight/day
Acute - systemic effects, inhalation	82.3 mg/m³
Long-term - systemic effects, dermal	11.8 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	8.3 mg/m³
DNEL/DMEL (General population)	
Long-term - systemic effects,oral	0.42 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	1.5 mg/m³
Long-term - systemic effects, dermal	4.2 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	0.51 mg/l
PNEC aqua (marine water)	0.051 mg/l
PNEC aqua (intermittent, freshwater)	2 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	2.524 mg/kg dwt
PNEC sediment (marine water)	0.252 mg/kg dwt
PNEC (Soil)	
PNEC soil	0.206 mg/kg dwt
PNEC (Oral)	
PNEC oral (secondary poisoning)	22 mg/kg food
PNEC (STP)	
PNEC sewage treatment plant	200 mg/l

Occupational Exposure Limits / Workplace Exposure Limits for particles not otherwise classified or regulated (nuisance dust) : - in UK: Inhalable: 10 mg/m³. Respirable: 4 mg/m³
- in Ireland: Inhalable: 10 mg/m³. Respirable: 4 mg/m³

Additional information : Exposure limit values have been established by many authorities. Check on limit values that apply in your local situation. Ensure all national/local regulations are observed.

8.1.5. Control banding

No additional information available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:
Ensure good ventilation of the work station. Technical measures and the use of appropriate work procedures take precedence over the use of personal protective equipment.

8.2.2. Personal protection equipment

Personal protective equipment symbol(s):

8.2.2.1. Eye and face protection

Eye protection:
Wear safety glasses according to EN 166

Eye protection			
Type	**Field of application**	**Characteristics**	**Standard**
Safety glasses with side shields	Droplet		EN 166
Safety glasses with side shields	Dust		EN 166

8.2.2.2. Skin protection

Skin and body protection:
Wear suitable protective clothing

Skin and body protection	
Type	**Standard**
Wear long-sleeved protective clothing	

Hand protection:
In case of repeated or prolonged contact wear gloves. Please observe the glove supplier's specifications regarding permeability and breakthrough time. Also consider the specific local conditions in which the product will be used, such as cut hazard, abrasion and contact time.

Hand protection					
Type	**Material**	**Permeation**	**Thickness (mm)**	**Penetration**	**Standard**
protective gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	≥ 0,11		EN ISO 374
protective gloves	Chloroprene rubber (CR), Polyvinylchloride (PVC)	6 (> 480 minutes)	0,5		EN ISO 374
protective gloves	Fluoroelastomer (FKM)	6 (> 480 minutes)	0,4		EN ISO 374

Other skin protection

Materials for protective clothing:
Not required for normal conditions of use

8.2.2.3. Respiratory protection

Respiratory protection:
No special protection required where adequate ventilation is maintained. In case of insufficient ventilation, wear suitable respiratory equipment. Provide by spray application improved respiratory protection by using at least a combination filter A/P2 or A/P3 or a supplied air system, depending on the extend of spray operation, duration of spraying, extend of aerosol formation, etc. [In case of inadequate ventilation] wear respiratory protection.

8.2.2.4. Thermal hazards

No additional information available.

8.2.3. Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment. Do not allow to enter drains or water courses.

Other information:
Training staff on good practice. Do not eat, drink or smoke when using this product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water and soap.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	white.
Appearance	:	Water based dispersion.
Odour	:	odourless.
Odour threshold	:	Not available
Melting point	:	Not applicable
Freezing point	:	0 °C
Boiling point	:	100 °C
Flammability	:	Not applicable
Explosive properties	:	Presents no particular fire or explosion hazard.
Explosive limits	:	Not available
Lower explosion limit	:	Not available
Upper explosion limit	:	Not available
Flash point	:	Not available
Auto-ignition temperature	:	Not available
Decomposition temperature	:	Not available
pH	:	6 – 9
Viscosity, kinematic	:	Not available
Viscosity, dynamic	:	20000 – 60000 cP (Brookfield 25°C)
Solubility	:	Soluble in water.
Partition coefficient n-octanol/water (Log Kow)	:	Not available
Vapour pressure	:	Not available
Vapour pressure at 50°C	:	Not available
Density	:	≈ 1.35 kg/l
Relative density	:	Not available
Relative vapour density at 20°C	:	Not available
Particle characteristics	:	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available.

9.2.2. Other safety characteristics

Miscibility	:	≈ 71 %
VOC content	:	< 10 g/l (Dir 2004/42/CE Annex II, A - max. VOC - Phase II, i, WB: 140 g/l)
Percent Solids	:	Not available

SECTION 10: Stability and reactivity

10.1. Reactivity

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

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

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

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

No additional information available.

SECTION 11: Toxicological information

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

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

Reaction mass of 2-methyl-2H-isothiazol-3-one and 5-chloro-2-methyl-2H-isothiazol-3-one (55965-84-9)	
ATE CLP (oral)	100 mg/kg bodyweight
ATE CLP (dermal)	50 mg/kg bodyweight
ATE CLP (gases)	100 ppmv/4h
ATE CLP (vapours)	0.5 mg/l/4h
ATE CLP (dust,mist)	0.05 mg/l/4h

Polyphoshoric acids, ammonium salts (68333-79-9)	
LD50 oral rat	300 – 2000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline 420 (Acute Oral Toxicity - Fixed Dose Method), Guideline: EU Method B.1 bis (Acute Oral Toxicity - Fixed Dose Procedure)

titanium dioxide (13463-67-7)	
LD50 oral rat	> 5000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline 425 (Acute Oral Toxicity: Up-and-Down Procedure), Guideline: EPA OPPTS 870.1100 (Acute Oral Toxicity)
LD50 dermal rabbit	> 5000 mg/kg
LC50 Inhalation - Rat	> 6.8 mg/l/4h

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
LD50 oral rat	3161 mg/kg
LD50 dermal rabbit	> 1000 mg/kg bodyweight
LC50 Inhalation - Rat (Dust/Mist)	> 5190 mg/l/4h
ATE CLP (oral)	3161 mg/kg bodyweight

Pentaerythritol (115-77-5)	
LD50 oral rat	> 5110 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 401 (Acute Oral Toxicity), Guideline: other:, Remarks on results: other:
LD50 dermal rabbit	> 10000 mg/kg bodyweight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity), Remarks on results: other:

Skin corrosion/irritation : Not classified
pH: 6 – 9
Serious eye damage/irritation : Not classified
pH: 6 – 9
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Suspected of causing cancer.

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
IARC group	2B - Possibly carcinogenic to humans

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
NOAEL (chronic, oral, animal/male, 2 years)	≈ 140 mg/kg bodyweight
Additional information	In animal studies carcinomas were observed at high doses in the bladder of male rats, caused by the formation of bladder stones and their constant irritation.

Reproductive toxicity : Suspected of damaging fertility.
Additional information : Due to the melamine content of the product, the classification criteria according to the CLP Regulation No 1272/2008 are fulfilled.
Toxicological data for the product are not available.

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
Additional information	The substance may cause damage to the testes after repeated ingestion (oral) of high doses, as shown in animal studies. The potential to impair fertility cannot be excluded.

STOT-single exposure : Not classified
STOT-repeated exposure : Not classified

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
Additional information	The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies.

Pentaerythritol (115-77-5)	
NOAEL (oral, rat, 90 days)	1000 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents), Remarks on results: other:

Aspiration hazard : Not classified

Pentaerythritol (115-77-5)	
Viscosity, kinematic	Not applicable

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

No additional information available.

11.2.2. Other information

Other information : No experimental study on the product is available. The information given is based on our knowledge of the components and the classification of the product is determined by calculation

SECTION 12: Ecological information

12.1. Toxicity

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

Polyphoshoric acids, ammonium salts (68333-79-9)	
EC50 72h - Algae [1]	> 97.1 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)

titanium dioxide (13463-67-7)	
LC50 - Fish [1]	> 1000 mg/l
LC50 - Fish [2]	> 10000 mg/l

titanium dioxide (13463-67-7)	
EC50 - Crustacea [1]	> 1000 mg/l
EC50 - Other aquatic organisms [1]	> 10000 mg/l
EC50 72h - Algae [1]	> 100 mg/l
EC50 72h - Algae [2]	> 10000 mg/l

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
LC50 - Fish [1]	> 3000 mg/l Test organisms (species): Oncorhynchus mykiss (previous name: Salmo gairdneri)
EC50 - Crustacea [1]	200 mg/l Test organisms (species): Daphnia magna
EC50 96h - Algae [1]	325 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
LOEC (chronic)	> 11 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC (chronic)	≥ 11 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC chronic fish	≥ 5.1 mg/l Test organisms (species): Pimephales promelas Duration: '36 d'

Pentaerythritol (115-77-5)	
LC50 - Fish [1]	> 100 mg/l Test organisms (species): Oryzias latipes
EC50 72h - Algae [1]	1000 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
NOEC (chronic)	1000 mg/l Test organisms (species): Daphnia magna Duration: '21 d'

12.2. Persistence and degradability

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
Persistence and degradability	Not readily biodegradable.

12.3. Bioaccumulative potential

1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	
BCF - Fish [1]	3.8 mg/kg
Partition coefficient n-octanol/water (Log Pow)	-1.22
Bioaccumulative potential	Not expected to bioaccumulate.

Pentaerythritol (115-77-5)	
Partition coefficient n-octanol/water (Log Pow)	-1.7

12.4. Mobility in soil

No additional information available.

12.5. Results of PBT and vPvB assessment

Component	
1,3,5-triazine-2,4,6-triamine; melamine (108-78-1)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Endocrine disrupting properties

No additional information available.

12.7. Other adverse effects

Additional information : Do not allow entry to drains, sewers, water courses or soil.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Disposal must be done according to official regulations.
Product/Packaging disposal recommendations : Dispose as hazardous waste. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
Additional information : Do not allow entry to drains, sewers, water courses or soil.
European List of Waste (LoW) code : Please refer to the European list (Decision N° 2000/532/CE) to identify the wastes appropriate waste number.
08 01 11* - waste paint and varnish containing organic solvents or other dangerous substances
HP Code : HP10 - “Toxic for reproduction:” waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring.

SECTION 14: Transport information

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

14.1. UN number or ID number

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

14.2. UN proper shipping name

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

14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR) : Not regulated.

IMDG
Transport hazard class(es) (IMDG) : Not regulated.

IATA
Transport hazard class(es) (IATA) : Not regulated.

ADN
Transport hazard class(es) (ADN) : Not regulated.

RID
Transport hazard class(es) (RID) : Not regulated.

14.4. Packing group

Packing group (ADR) : Not regulated.
Packing group (IMDG) : Not regulated.
Packing group (IATA) : Not regulated.
Packing group (ADN) : Not regulated.

Packing group (RID) : Not regulated.

14.5. Environmental hazards

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

14.6. Special precautions for user

Overland transport
Not regulated.

Transport by sea
Not regulated.

Air transport
Not regulated.

Inland waterway transport
Not regulated.

Rail transport
Not regulated.

14.7. Maritime transport in bulk according to IMO instruments

Not established.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

Contains no substance(s) listed on REACH Annex XVII (Restriction Conditions)

REACH Annex XIV (Authorisation List)

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains substance(s) listed on the REACH Candidate List in concentrations ≥ 0.1 % or SCL: 1,3,5-triazine-2,4,6-triamine; melamine (EC 203-615-4, CAS 108-78-1)

PIC Regulation (Prior Informed Consent)

Contains no substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals)

POP Regulation (Persistent Organic Pollutants)

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

Ozone Regulation (1005/2009)

Contains no substance(s) listed on the Ozone Depletion list (Regulation EU 1005/2009 on substances that deplete the ozone layer)

VOC Directive (2004/42)

VOC content : < 10 g/l (Dir 2004/42/CE Annex II, A - max. VOC - Phase II, i, WB: 140 g/l)

Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

15.1.2. National regulations

No additional information available.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:
2. Hazards identification. 3.2. Mixtures. attachment.

Full text of H- and EUH-statements:	
Acute Tox. 2 (Dermal)	Acute toxicity (dermal), Category 2
Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Carc. 2	Carcinogenicity, Category 2
EUH208	Contains reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7], and 2-methyl-2H -isothiazol-3-one [EC no. 220-239-6] (3:1)(55965-84-9). May produce an allergic reaction.
EUH211	Warning! Hazardous respirable droplets may be formed when sprayed. Do not breathe spray or mist.
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H351	Suspected of causing cancer.
H361f	Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr. 2	Reproductive toxicity, Category 2
Skin Corr. 1C	Skin corrosion/irritation, Category 1, Sub-Category 1C
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1A	Skin sensitisation, category 1A
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:		
Carc. 2	H351	Calculation method
Repr. 2	H361f	Expert judgement

Safety Data Sheet applicable for regions : IE;MT;GB

Annex to the safety data sheet

Lead substance	Identified Uses	Es N°	Short title	Page
1,3,5-triazine-2,4,6-triamine; melamine	Formulation & (re)packing of substances and mixtures	1	Formulation & (re)packing of substances and mixtures; Adhesives, sealants (PC1).; Coatings and paints, thinners, paint removers (PC9a).; Laboratory chemicals (PC21).	**17**
1,3,5-triazine-2,4,6-triamine; melamine	Use as an additive in intumescent coatings	2	Use as additive in intumescent coatings; Coatings and paints, thinners, paint removers (PC9a).; Polymer preparations and compounds (PC32).; Manufacture of plastics products, including compounding and conversion (SU12).; General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment (SU17).; Building and construction work (SU19).	**39**
1,3,5-triazine-2,4,6-triamine; melamine	Use as an additive in intumescent coatings	3	Use as additive in intumescent coatings; Coatings and paints, thinners, paint removers (PC9a).; Polymer preparations and compounds (PC32).; Manufacture of plastics products, including compounding and conversion (SU12).; Building and construction work (SU19).	**60**
1,3,5-triazine-2,4,6-triamine; melamine	Intumescent coatings - Workers (industrial)	4	Knitwear, textiles and clothing: large-area products (AC5a); metal products: Large-area products (AC7a); Plastic products (AC13)	**71**
1,3,5-triazine-2,4,6-triamine; melamine	Intumescent coatings - professional users	5	Knitwear, textiles and clothing: large-area products (AC5a); metal products: Large-area products (AC7a); Plastic products (AC13)	**75**
1,3,5-triazine-2,4,6-triamine; melamine	Intumescent coatings - Consumers	6	Plastic articles	**78**

1. ES1 - Industrial; Formulation & (re)packing of substances and mixtures

1.1. Title section

Formulation & (re)packing of substances and mixtures	
ES Ref.: ES1 ES Type: Worker Version: 2.0 Revision date: 8/30/2023	

Environment		Use descriptors
CS1	Formulation & (re)packing of substances and mixtures	ERC2

Worker		Use descriptors
CS2	Production or refining of chemicals in a closed, continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC2
CS3	Use in closed batch process (synthesis or formulation)	PROC3

Worker		Use descriptors
CS4	Use in batch and other processes (synthesis) where there is a possibility of exposure	PROC4
CS5	Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact)	PROC5
CS6	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product.	PROC8a
CS7	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only.	PROC8b
CS8	Transfer of the substance or preparation into small containers (special filling equipment, including weighing)	PROC9
CS9	Production of preparations or products by tabletting, pressing, extruding, peeling	PROC14
CS10	Use as laboratory reagent	PROC15
CS11	Hand mixing with close contact and personal protective equipment only	PROC19
CS12	Manual maintenance (cleaning and repair) of machinery	PROC28
CS13	Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact)	PROC5
CS14	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only.	PROC8b
CS15	Use as laboratory reagent	PROC15
CS16	Manual maintenance (cleaning and repair) of machinery	PROC28
CS17	Hand mixing with close contact and personal protective equipment only	PROC19
CS18	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product.	PROC8a

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation & (re)packing of substances and mixtures (ERC2)

ERC2	Formulation into mixture

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	20005.1 kg/day

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant	0.169 % water effectiveness
Flow from municipal sewage treatment plant assumed (m^3/day)	≥ 2000 m^3/d
Controlled application of sewage sludge on agricultural soil	Yes

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Salt water dilution factor	100	
Flow rate of receiving surface water (m^3/day)	≥ 18000	m^3/d

1.2.2. Control of worker exposure: Production or refining of chemicals in a closed, continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.3. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the palms / one hand / the palms of the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.4. Control of worker exposure: Use in batch and other processes (synthesis) where there is a possibility of exposure (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %

Product (article) characteristics	
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.5. Control of worker exposure: Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

PROC5	Mixing or blending in batch processes

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.6. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	

Other conditions affecting workers exposure	
Assumes a process temperature up to	40 °C

1.2.7. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.8. Control of worker exposure: Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.9. Control of worker exposure: Production of preparations or products by tabletting, pressing, extruding, peeling (PROC14)

PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.

Conditions and measures related to personal protection, hygiene and health evaluation	
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.10. Control of worker exposure: Use as laboratory reagent (PROC15)

PROC15	Use as laboratory reagent

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the palms / one hand / the palms of the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.11. Control of worker exposure: Hand mixing with close contact and personal protective equipment only (PROC19)

PROC19	Manual activities involving hand contact

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Avoid carrying out operation for more than 4 hours,Covers frequency up to:	≤ 4 h/day

Technical and organisational conditions and measures	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Efficiency of at least:	95 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

PROC28	Manual maintenance (cleaning and repair) of machinery

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	40 °C

1.2.13. Control of worker exposure: Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

PROC5	Mixing or blending in batch processes

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.2.14. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.2.15. Control of worker exposure: Use as laboratory reagent (PROC15)

PROC15	Use as laboratory reagent

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the palms / one hand / the palms of the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

PROC28	Manual maintenance (cleaning and repair) of machinery

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	

Technical and organisational conditions and measures	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.2.17. Control of worker exposure: Hand mixing with close contact and personal protective equipment only (PROC19)

PROC19	Manual activities involving hand contact

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide general mechanical ventilation with a fan.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%
The activity is followed by a period of evaporation, drying or curing	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
Regular servicing and maintenance of machines and devices.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Efficiency of at least:	95 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.2.18. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure Formulation & (re)packing of substances and mixtures (ERC2)

Information for contributing exposure scenario		
Air emission factor	2.5 %	

Information for contributing exposure scenario		
Water emission factor	2 %	
Soil emission factor	0.01 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.255 mg/l	0.51 mg/l	0.5	EUSES 2.2.0
Marine water	0.026 mg/l	0.051 mg/l	0.5	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	0.04	EUSES 2.2.0
Freshwater sediment	1.26 mg/kg dwt	2.524 mg/kg dwt	0.5	EUSES 2.2.0
Marine water sediment	0.126 mg/kg dwt	0.252 mg/kg dwt	0.5	EUSES 2.2.0
Sewage treatment plant	2.496 mg/l	200 mg/l	0.01	EUSES 2.2.0
Soil	0.029 mg/kg dwt	0.206 mg/kg dwt	0.14	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	5 kg/day	Release estimation
Release estimation	Air	1 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

1.3.2. Worker exposure Production or refining of chemicals in a closed, continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.116	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.5 mg/m³	0.06	ECETOC TRA worker v2.0

Information for contributing exposure scenario			
Sum RCR - Long-term - systemic effects		0.176	
Inhalation - Acute - systemic effects	2 mg/m³	0.024	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.024	

1.3.3. Worker exposure Use in closed batch process (synthesis or formulation) (PROC3)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0.69 mg/kg bw/day	0.058	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.178	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.049	

1.3.4. Worker exposure Use in batch and other processes (synthesis) where there is a possibility of exposure (PROC4)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	1.372 mg/kg bw/day	0.116	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.718	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

1.3.5. Worker exposure Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.834	

Information for contributing exposure scenario			
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

1.3.6. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.834	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

1.3.7. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.352	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.049	

1.3.8. Worker exposure Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	1.372 mg/kg bw/day	0.116	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.718	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0

Information for contributing exposure scenario			
Sum RCR - Acute - systemic effects		0.243	

1.3.9. Worker exposure Production of preparations or products by tabletting, pressing, extruding, peeling (PROC14)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	3.43 mg/kg bw/day	0.291	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.411	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.049	

1.3.10. Worker exposure Use as laboratory reagent (PROC15)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.029	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.5 mg/m³	0.06	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.089	
Inhalation - Acute - systemic effects	2 mg/m³	0.024	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.024	

1.3.11. Worker exposure Hand mixing with close contact and personal protective equipment only (PROC19)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	7.072 mg/kg bw/day	0.599	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	3 mg/m³	0.361	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.96	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

1.3.12. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

Information for contributing exposure scenario			
Exposure estimation: PROC 8a, TRA Workers v3.1			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v3.1
Inhalation - Long-term - systemic effects	5 mg/kg bw/day	0.602	ECETOC TRA worker v3.1
Sum RCR - Long-term - systemic effects		0.834	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		0.243	

1.3.13. Worker exposure Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.743 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

1.3.14. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

1.3.15. Worker exposure Use as laboratory reagent (PROC15)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.029	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.092	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

1.3.16. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

Information for contributing exposure scenario			
Exposure estimation: PROC 8a, TRA Workers v3.1			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v3.1
Inhalation - Long-term - systemic effects	0.525 mg/kg bw/day	0.063	ECETOC TRA worker v3.1
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		< 0.01	

1.3.17. Worker exposure Hand mixing with close contact and personal protective equipment only (PROC19)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	7.072 mg/kg bw/day	0.599	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1.74 mg/m³	0.21	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.809	
Inhalation - Acute - systemic effects	1.74 mg/m³	0.021	Stoffenmanager v8
Sum RCR - Acute - systemic effects		0.021	

1.3.18. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

1.4.1. Environment

Guidance - Environment	Not relevant

1.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)

2. ES2 - Industrial; Use as an additive in intumescent coatings

2.1. Title section

Use as an additive in intumescent coatings	
ES Ref.: ES2 ES Type: Worker Version: 2.0 Revision date: 8/30/2023	

Environment		Use descriptors
CS1	Industrial use resulting in inclusion inside or on the surface of an article	ERC5

Worker		Use descriptors
CS2	Use in closed batch process (synthesis or formulation)	PROC3
CS3	Use in batch and other processes (synthesis) where there is a possibility of exposure	PROC4
CS4	Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact)	PROC5
CS5	Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - with LEV (PROC7)	PROC7
CS6	Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - without LEV (PROC7)	PROC7
CS7	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product.	PROC8a
CS8	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only.	PROC8b
CS9	Transfer of the substance or preparation into small containers (special filling equipment, including weighing)	PROC9
CS10	Handling of liquids on large surfaces or large work pieces	PROC10
CS11	Treatment of articles by dipping and pouring	PROC13
CS12	Use as laboratory reagent	PROC15
CS13	Handling of liquids using low pressure, low speed or on medium-sized surfaces	PROC19
CS14	Manual maintenance (cleaning and repair) of machinery	PROC28

Worker		Use descriptors
CS15	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only.	PROC8b
CS16	Manual maintenance (cleaning and repair) of machinery	PROC28
CS17	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product.	PROC8a

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Industrial use resulting in inclusion inside or on the surface of an article (ERC5)

ERC5	Use at industrial site leading to inclusion into/onto article

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	164554.4 kg/day

Conditions and measures related to sewage treatment plant	
Municipal Sewage Treatment Plant	0.169 % water effectiveness
Flow from municipal sewage treatment plant assumed (m^3/day)	≥ 2000 m^3/d
Controlled application of sewage sludge on agricultural soil	Yes

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Salt water dilution factor	100	
Flow rate of receiving surface water (m^3/day)	≥ 18000	m^3/d

2.2.2. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the palms / one hand / the palms of the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.3. Control of worker exposure: Use in batch and other processes (synthesis) where there is a possibility of exposure (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.4. Control of worker exposure: Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

PROC5	Mixing or blending in batch processes

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.5. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - with LEV (PROC7) (PROC7)

PROC7	Industrial spraying

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
The activity is followed by a period of evaporation, drying or curing	
Mechanical ventilation	
Local ventilation. Efficiency of at least:	95 %. Efficacy Inhalation 0%, Dermal 0%
Ensure regular inspection, cleaning and maintenance of equipment and machines.	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
Provide general mechanical ventilation with a fan.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands and forearms.	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Indoor use	
Assumes a process temperature up to	40 °C
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

2.2.6. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - without LEV (PROC7) (PROC7)

PROC7	Industrial spraying

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
The activity is followed by a period of evaporation, drying or curing	
Mechanical ventilation	
Ensure regular inspection, cleaning and maintenance of equipment and machines.	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Wear suitable respiratory protection. Inhalation - minimum efficiency of	90 % For further specifications, please refer to section 8 of the SDS.

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands and forearms.	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Indoor use	
Assumes a process temperature up to	40 °C
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

2.2.7. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	

Technical and organisational conditions and measures	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.8. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.9. Control of worker exposure: Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.10. Control of worker exposure: Handling of liquids on large surfaces or large work pieces (PROC10)

PROC10	Roller application or brushing

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
The activity is followed by a period of evaporation, drying or curing	
Mechanical ventilation	
Ensure regular inspection, cleaning and maintenance of equipment and machines.	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Indoor use	
Assumes a process temperature up to	≤ 115 °C
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

2.2.11. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

2.2.12. Control of worker exposure: Use as laboratory reagent (PROC15)

PROC15	Use as laboratory reagent

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the palms / one hand / the palms of the hands.	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.13. Control of worker exposure: Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

PROC19	Manual activities involving hand contact

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
The activity is followed by a period of evaporation, drying or curing	
Mechanical ventilation	
Ensure regular inspection, cleaning and maintenance of equipment and machines.	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least:	95 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Indoor use	
Assumes a process temperature up to	≤ 115 °C
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

2.2.14. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

PROC28	Manual maintenance (cleaning and repair) of machinery

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	40 °C

2.2.15. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

2.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

PROC28	Manual maintenance (cleaning and repair) of machinery

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

2.2.17. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure Industrial use resulting in inclusion inside or on the surface of an article (ERC5)

Information for contributing exposure scenario		
Air emission factor	50 %	
Water emission factor	50 %	
Soil emission factor	0 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.155 mg/l	0.51 mg/l	0.3	EUSES 2.2.0
Marine water	0.0155 mg/l	0.051 mg/l	0.3	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	0.02	EUSES 2.2.0
Freshwater sediment	0.766 mg/kg dwt	2.524 mg/kg dwt	0.3	EUSES 2.2.0
Marine water sediment	0.077 mg/kg dwt	0.252 mg/kg dwt	0.3	EUSES 2.2.0
Sewage treatment plant	1.497 mg/l	200 mg/l	< 0.01	EUSES 2.2.0
Soil	0.017 mg/kg dwt	0.206 mg/kg dwt	0.08	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	3 kg/day	Release estimation
Release estimation	Air	0.5 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

2.3.2. Worker exposure Use in closed batch process (synthesis or formulation) (PROC3)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0.69 mg/kg bw/day	0.058	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.178	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0

Information for contributing exposure scenario			
Sum RCR - Acute - systemic effects		0.049	

2.3.3. Worker exposure Use in batch and other processes (synthesis) where there is a possibility of exposure (PROC4)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	1.372 mg/kg bw/day	0.116	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.718	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

2.3.4. Worker exposure Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.834	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

2.3.5. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - with LEV (PROC7) (PROC7)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	8.572 mg/kg bw/day	0.726	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.4 mg/m³	0.048	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.774	
Inhalation - Acute - systemic effects	0.4 mg/m³	< 0.01	Stoffenmanager v8
Sum RCR - Acute - systemic effects		< 0.01	

2.3.6. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - without LEV (PROC7) (PROC7)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	8.572 mg/kg bw/day	0.726	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.795 mg/m³	0.096	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.822	
Inhalation - Acute - systemic effects	0.795 mg/m³	< 0.01	Stoffenmanager v8
Sum RCR - Acute - systemic effects		< 0.01	

2.3.7. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.834	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

2.3.8. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.352	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.049	

2.3.9. Worker exposure Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	1.372 mg/kg bw/day	0.116	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.718	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

2.3.10. Worker exposure Handling of liquids on large surfaces or large work pieces (PROC10)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	5.486 mg/kg bw/day	0.465	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	3.59 mg/m³	0.433	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.898	
Inhalation - Acute - systemic effects	3.59 mg/m³	0.044	Stoffenmanager v8
Sum RCR - Acute - systemic effects		0.044	

2.3.11. Worker exposure Treatment of articles by dipping and pouring (PROC13)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.743 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		< 0.01	

2.3.12. Worker exposure Use as laboratory reagent (PROC15)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.029	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.5 mg/m³	0.06	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.089	
Inhalation - Acute - systemic effects	2 mg/m³	0.024	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.024	

2.3.13. Worker exposure Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	7.072 mg/kg bw/day	0.599	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1.74 mg/m³	0.21	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.809	
Inhalation - Acute - systemic effects	1.74 mg/m³	0.021	Stoffenmanager v8
Sum RCR - Acute - systemic effects		0.021	

2.3.14. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

Information for contributing exposure scenario			
Exposure estimation: PROC 8a, TRA Workers v3.1			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v3.1
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v3.1
Sum RCR - Long-term - systemic effects		0.834	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		0.243	

2.3.15. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.743 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

2.3.16. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

Information for contributing exposure scenario			
Exposure estimation: PROC 8a, TRA Workers v3.1			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v3.1
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v3.1
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		< 0.01	

2.3.17. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

2.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

2.4.1. Environment

Guidance - Environment	Not relevant

2.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)

3. ES3 - Professional; Use as an additive in intumescent coatings

3.1. Title section

Use as an additive in intumescent coatings	
ES Ref.: ES3 ES Type: Worker Version: 2.0 Revision date: 8/31/2023	

Environment		Use descriptors
CS1	Use as an additive in intumescent coatings	ERC8c, ERC8f

Worker		Use descriptors
CS2	Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact)	PROC5
CS3	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product.	PROC8a
CS4	Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only.	PROC8b
CS5	Transfer of the substance or preparation into small containers (special filling equipment, including weighing)	PROC9
CS6	Handling of liquids on large surfaces or large work pieces	PROC10
CS7	Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze	PROC11
CS8	Treatment of articles by dipping and pouring	PROC13
CS9	Manual maintenance (cleaning and repair) of machinery	PROC28

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Use as an additive in intumescent coatings (ERC8c, ERC8f)

ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	515.2 kg/day

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant	0.169 % water effectiveness

Conditions and measures related to sewage treatment plant	
Flow from municipal sewage treatment plant assumed (m³/day)	≥ 2000 m³/d
Controlled application of sewage sludge on agricultural soil	Yes

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Flow rate of receiving surface water (m³/day)	≥ 18000	m³/d
Salt water dilution factor	100	

3.2.2. Control of worker exposure: Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

PROC5	Mixing or blending in batch processes

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.2.3. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.115 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	< 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.2.4. Control of worker exposure: Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.2.5. Control of worker exposure: Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	< 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.2.6. Control of worker exposure: Handling of liquids on large surfaces or large work pieces (PROC10)

PROC10	Roller application or brushing

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
The activity is followed by a period of evaporation, drying or curing	
Provide general mechanical ventilation with a fan.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
Regular servicing and maintenance of machines and devices.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Indoor use	
Assumes a process temperature up to	≤ 115 °C
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

3.2.7. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC11)

PROC11	Non industrial spraying

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Mechanical ventilation	
The activity is followed by a period of evaporation, drying or curing	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable respiratory protection. Inhalation - minimum efficiency of	95 % For further specifications, please refer to section 8 of the SDS.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least:	90 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands and forearms.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C
Use in room with a volume of minimum 100 m3.	100 - 1000 m³
Safety distance: Operator breathing zone (<1 metre)	face-to-product distance

3.2.8. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

PROC13	Treatment of articles by dipping and pouring

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.

Conditions and measures related to personal protection, hygiene and health evaluation	
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
It is assumed that potential dermal contact is limited to the hands.	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.2.9. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

PROC28	Manual maintenance (cleaning and repair) of machinery

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	≤ 30 %
Vapour pressure	< 0.01 Pa

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable gloves tested to EN374. Efficiency of at least:	80 % For further specifications, please refer to section 8 of the SDS.
If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands.	
Respiratory protection	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	≤ 115 °C

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure Use as an additive in intumescent coatings (ERC8c, ERC8f)

Information for contributing exposure scenario		
The environmental risk is determined by indirect (oral) human intake.		
Air emission factor	15 %	
Water emission factor	1 %	

Information for contributing exposure scenario		
Soil emission factor	0 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.005 mg/l	0.51 mg/l	0.01	EUSES 2.2.0
Marine water	0.0005 mg/l	0.051 mg/l	0.01	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	< 0.01	EUSES 2.2.0
Freshwater sediment	0.025 mg/kg dwt	2.524 mg/kg dwt	0.01	EUSES 2.2.0
Marine water sediment	0.0024 mg/kg dwt	0.252 mg/kg dwt	0.01	EUSES 2.2.0
Sewage treatment plant	< 0 mg/l	200 mg/l	< 0.01	EUSES 2.2.0
Soil	0 mg/kg dwt	0.206 mg/kg dwt	< 0.01	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	0 kg/day	Release estimation
Release estimation	Air	0 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

3.3.2. Worker exposure Mixing or blending in batch processes for the formulation of preparations and articles (multiple and/or significant contact) (PROC5)

Information for contributing exposure scenario			
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0

Information for contributing exposure scenario			
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

3.3.3. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities not specifically designed for only one product. (PROC8a)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

3.3.4. Worker exposure Transfer of the substance or preparation (charging/discharging) from/to vessels/large containers in facilities specifically designed for one product only. (PROC8b)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.742 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

3.3.5. Worker exposure Transfer of the substance or preparation into small containers (special filling equipment, including weighing) (PROC9)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.581	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.644	

Information for contributing exposure scenario			
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

3.3.6. Worker exposure Handling of liquids on large surfaces or large work pieces (PROC10)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	5.486 mg/kg bw/day	0.465	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	3.61 mg/m³	0.435	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.9	
Inhalation - Acute - systemic effects	3.61 mg/m³	0.044	Stoffenmanager v8
Sum RCR - Acute - systemic effects		0.044	

3.3.7. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC11)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	10.71 mg/kg bw/day	0.908	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.398 mg/m³	0.048	Stoffenmanager v8
Sum RCR - Long-term - systemic effects		0.956	
Inhalation - Acute - systemic effects	0.398 mg/m³	< 0.01	Stoffenmanager v8
Sum RCR - Acute - systemic effects		< 0.01	

3.3.8. Worker exposure Treatment of articles by dipping and pouring (PROC13)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.743 mg/kg bw/day	0.232	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		< 0.01	

3.3.9. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

Information for contributing exposure scenario			
Exposure estimation: PROC 8a, TRA Workers v3.1			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.743 mg/kg bw/day	0.232	ECETOC TRA worker v3.1
Inhalation - Long-term - systemic effects	0.525 mg/m³	0.063	ECETOC TRA worker v3.1
Sum RCR - Long-term - systemic effects		0.295	
Inhalation - Acute - systemic effects	0.525 mg/m³	< 0.01	ECETOC TRA worker v3.1
Sum RCR - Acute - systemic effects		< 0.01	

3.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

3.4.1. Environment

Guidance - Environment	Not relevant

3.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)

4. ES4 - Service life; Intumescent coatings - Workers (industrial)

4.1. Title section

Intumescent coatings - Workers (industrial)	
ES Ref.: ES4 ES Type: Worker Version: 2.0 Revision date: 8/31/2023	

Environment		Use descriptors
CS1	Processing of articles at low release industrial sites	ERC12a

Worker		Use descriptors
CS2	Low energy manipulation of substances bound in materials and/or articles	PROC21
CS3	High (mechanical) energy work-up of substances bound in materials and/or articles	PROC24

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Processing of articles at low release industrial sites (ERC12a)

ERC12a	Processing of articles at industrial sites with low release

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	4701.4 t/d

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant	0.169 % water effectiveness
Flow from municipal sewage treatment plant assumed (m^3/day)	≥ 2000 m^3/d
Controlled application of sewage sludge on agricultural soil	Yes

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Salt water dilution factor	100	
Flow rate of receiving surface water (m^3/day)	≥ 18000	m^3/d

4.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC21)

PROC21	Low energy manipulation and handling of substances bound in/on materials or articles

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%
protective gloves	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	40 °C

4.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in materials and/or articles (PROC24)

PROC24	High (mechanical) energy work-up of substances bound in /on materials and/or articles

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	
local exhaust system	No. Efficacy Inhalation 0%, Dermal 0%

Conditions and measures related to personal protection, hygiene and health evaluation	
Use eye protection according to EN 166.	
Respiratory protection	No. Efficacy: 0%
protective gloves	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	40 °C

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure Processing of articles at low release industrial sites (ERC12a)

Information for contributing exposure scenario		
Air emission factor	2.5 %	
Water emission factor	2.5 %	
Soil emission factor	0 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.005 mg/l	0.51 mg/l	0.01	EUSES 2.2.0
Marine water	0.0005 mg/l	0.051 mg/l	0.01	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	< 0.01	EUSES 2.2.0
Freshwater sediment	0.025 mg/kg dwt	2.524 mg/kg dwt	0.01	EUSES 2.2.0
Marine water sediment	0.0024 mg/kg dwt	0.252 mg/kg dwt	0.01	EUSES 2.2.0
Sewage treatment plant	0 mg/l	200 mg/l	< 0.01	EUSES 2.2.0
Soil	0 mg/kg dwt	0.206 mg/kg dwt	< 0.01	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	0 kg/day	Release estimation
Release estimation	Air	0 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

4.3.2. Worker exposure Low energy manipulation of substances bound in materials and/or articles (PROC21)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.83 mg/kg bw/day	0.24	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	3 mg/m³	0.361	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.601	
Inhalation - Acute - systemic effects	12 mg/m³	0.146	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.146	

4.3.3. Worker exposure High (mechanical) energy work-up of substances bound in materials and/or articles (PROC24)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.83 mg/kg bw/day	0.24	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	1 mg/m³	0.12	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.36	
Inhalation - Acute - systemic effects	4 mg/m³	0.049	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.049	

4.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.4.1. Environment

Guidance - Environment	Not relevant

4.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)

5. ES5 - Service life; Intumescent coatings - professional users

5.1. Title section

Intumescent coatings - professional users	
ES Ref.: ES5 ES Type: Worker Version: 2.0 Revision date: 8/31/2023	

Environment		Use descriptors
CS1	Processing ofarticles by professional users with low release	ERC10a, ERC11a

Worker		Use descriptors
CS2	Low energy manipulation of substances bound in materials and/or articles	PROC21

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Processing ofarticles by professional users with low release (ERC10a, ERC11a)

ERC10a	Widespread use of articles with low release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	515.2 kg/day

Conditions and measures related to sewage treatment plant	
Municipal sewage treatment plant	0.169 % water effectiveness
Flow from municipal sewage treatment plant assumed (m^3/day)	≥ 2000 m^3/d
Controlled application of sewage sludge on agricultural soil	Yes

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Salt water dilution factor	100	
Flow rate of receiving surface water (m^3/day)	≥ 18000	m^3/d

5.2.2. Control of worker exposure: Low energy manipulation of substances bound in materials and/or articles (PROC21)

PROC21	Low energy manipulation and handling of substances bound in/on materials or articles

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 100 %
Dustiness	Solid, medium dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	≤ 8 h/day

Technical and organisational conditions and measures	
Local ventilation	No. Efficacy Inhalation 0%, Dermal 0%
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	
Assumes that activities are undertaken with appropriate equipment and properly maintained by trained personnel working under supervision.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	No. Efficacy: 0%
protective gloves	No. Efficacy: 0%

Other conditions affecting workers exposure	
Indoor use	
Assumes a process temperature up to	40 °C

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure Processing ofarticles by professional users with low release (ERC10a, ERC11a)

Information for contributing exposure scenario		
Air emission factor	0.05 %	
Water emission factor	3.2 %	
Soil emission factor	0 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.005 mg/l	0.51 mg/l	0.01	EUSES 2.2.0
Marine water	0.0005 mg/l	0.051 mg/l	0.01	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	< 0.01	EUSES 2.2.0
Freshwater sediment	0.025 mg/kg dwt	2.524 mg/kg dwt	0.01	EUSES 2.2.0
Marine water sediment	0.0024 mg/kg dwt	0.252 mg/kg dwt	0.01	EUSES 2.2.0

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Sewage treatment plant	0 mg/l	200 mg/l	< 0.01	EUSES 2.2.0
Soil	0 mg/kg dwt	0.206 mg/kg dwt	< 0.01	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	0 kg/day	Release estimation
Release estimation	Air	0 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

5.3.2. Worker exposure Low energy manipulation of substances bound in materials and/or articles (PROC21)

Information for contributing exposure scenario			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Dermal - Long-term - systemic effects	2.83 mg/kg bw/day	0.24	ECETOC TRA worker v2.0
Inhalation - Long-term - systemic effects	5 mg/m³	0.602	ECETOC TRA worker v2.0
Sum RCR - Long-term - systemic effects		0.842	
Inhalation - Acute - systemic effects	20 mg/m³	0.243	ECETOC TRA worker v2.0
Sum RCR - Acute - systemic effects		0.243	

5.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

5.4.1. Environment

Guidance - Environment	Not relevant

5.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)

6. ES6 - Service life; Intumescent coatings - Consumers

6.1. Title section

Intumescent coatings - Consumers	
ES Ref.: ES6 ES Type: Consumer Version: 2.0 Revision date: 8/31/2023	

Environment		Use descriptors
CS1	Consumer use of low release articles	ERC10a, ERC11a

Consumer		Use descriptors
CS2	Plastic articles	

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Consumer use of low release articles (ERC10a, ERC11a)

ERC10a	Widespread use of articles with low release (outdoor)
ERC11a	Widespread use of articles with low release (indoor)

Amount used, frequency and duration of use (or from service life)	
Maximum daily site tonnage	515.2 kg/day

Other conditions affecting environmental exposure		
Dilution factor for local freshwater	10	
Salt water dilution factor	100	
Flow rate of receiving surface water (m^3/day)	≥ 18000	m^3/d

6.2.2. Control of consumer exposure: Plastic articles

Product (article) characteristics	
Physical form of product	Solid
Concentration of substance in product	≤ 30 %

Other conditions affecting consumer exposure	
Indoor use	

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure Consumer use of low release articles (ERC10a, ERC11a)

Information for contributing exposure scenario		
Air emission factor	0.05 %	
Water emission factor	3.2 %	
Soil emission factor	0 %	

Protection target	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	0.005 mg/l	0.51 mg/l	0.01	EUSES 2.2.0
Marine water	0.0005 mg/l	0.051 mg/l	0.01	EUSES 2.2.0
Secondary Poisoning		22 mg/kg food	< 0.01	EUSES 2.2.0
Freshwater sediment	0.025 mg/kg dwt	2.524 mg/kg dwt	0.01	EUSES 2.2.0
Marine water sediment	0.0024 mg/kg dwt	0.252 mg/kg dwt	0.01	EUSES 2.2.0
Sewage treatment plant	0 mg/l	200 mg/l	< 0.01	EUSES 2.2.0
Soil	0 mg/kg dwt	0.206 mg/kg dwt	< 0.01	EUSES 2.2.0

Release estimation	Release route	Release rate	Release estimation method
Release estimation	Water	0 kg/day	Release estimation
Release estimation	Air	0 kg/day	Release estimation
Release estimation	soil	0 kg/day	Release estimation

6.3.2. Consumer exposure Plastic articles

Information for contributing exposure scenario			
Inhalation exposure is considered to be not relevant,Oral exposure is considered to be not relevant,Skin exposure: Negligible			
Route of exposure and type of effects	**Exposure estimate**	**RCR**	**Method**
Oral - Long-term - systemic effects	0 mg/kg bw/day	< 0.01	
Dermal - Long-term - systemic effects	0 mg/kg bw/day	< 0.01	
Inhalation - Long-term - systemic effects	0 mg/m³	< 0.01	
Sum RCR - Long-term - systemic effects		< 0.03	

6.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

6.4.1. Environment

Guidance - Environment	Not relevant

6.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Do not exceed the Risk Characterisation Ratios (RCR)