



SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

SDS n° : FP12710

POLYCOR PATCH AID 2671

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Former date 19-Aug-2019

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Version: 2.1

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

1.1. Product identifier

Product name POLYCOR PATCH AID 2671
Chemical Name Gel Coat polyester for composites.
Pure substance/mixture Mixture
Unique Formula Identifier (UFI) KFK0-502U-Q00A-9YGX

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

Identified uses To form a protective and decorative layer for GRP composites. Contact us before using for food contact application.

1.3. Details of the supplier of the safety data sheet

Supplier

Polynt Composites France S.A.
Route d'Arras CS 50019 62320 Drocourt, France
Tel : (+33) 3 21 74 84 00 - Fax : (+33) 3 21 49 55 84

Polynt S.p.A.
Via Enrico Fermi, 51 24020 Scanzorosciate (BG), Italy
Tel : (+39) 035 652 111 - Fax : (+39) 035 652 421

Polynt Composites Spain, S.L.U.
Avenida República Argentina S/N 09200 Miranda de Ebro - Burgos, Spain
Tel : (+34) 947 027 202 - Fax : (+34) 947 31 45 40

Polynt Composites Poland Sp. z o.o.
ul. Grabska 11d, 32-005 Niepołomice, Poland
Tel : (+48) 12 281 42 00 - Fax : (+48) 12 281 42 01

Polynt Composites Norway AS
Lilleborggata 4, 1630 Gamle Fredrikstad, Norway
Tel : (+47) 693 570 00 - Fax : (+47) 693 570 01

Polynt Composites Stallingborough UK Ltd.
Laporte Road, Stallingborough - Near Grimsby North East Lincolnshire DN41 8DR,
United Kingdom
Tel : (+44) 1469 552 570 - Fax : (+44) 1469 552 597

The supplier of the product is, among those indicated above, the one identified on the label and / or in the sales documents

For further information, please contact

E-mail address sdsregulatory@polynt.com
Internet Address http://www.polynt.com

1.4. Emergency telephone number

This telephone number is available 24 hours per day, 7 days per week.

Europe : +44 1235 239 670

Middle East/Africa :	+44 1235 239 671
East/South East Asia :	+65 3158 1412
America :	+1 215 207 0061

**Poison Information Centre
telephone number**

European emergency phone number : 112
 UK : National Poisons Emergency Number : 0845 4647
 Ireland : National Poisons Information Centre (NPIC) Telephone Healthcare
 Professionals : +353 (01) 809 2566. (24 hour service) Telephone Members of Public :
 +353 (01) 809 2166. (8.00 a.m. to 10.00 p.m. 7 days a week)

SECTION 2: Hazards identification2.1. Classification of the substance or mixture

Classification of the substance or mixture - GHS/CLP (n° 1272/2008)

Skin Corrosion/Irritation	Category 2 - (H315)
Serious Eye Damage/Eye Irritation	Category 2 - (H319)
Skin Sensitization	Category 1 Sub-category 1A - (H317)
Reproductive Toxicity	Category 2 - (H361)
Specific Target Organ Toxicity (Single Exposure)	Category 3 - (H335)
Specific target organ toxicity - repeated exposure	Category 1 - (H372)
Chronic Aquatic Toxicity	Category 3 - (H412)
Flammable liquids	Category 3 - (H226)

2.2. Label elements

Contains cobalt octoate, Styrene

**Signal word****Danger****Hazard statements**

H315 - Causes skin irritation
 H317 - May cause an allergic skin reaction
 H319 - Causes serious eye irritation
 H335 - May cause respiratory irritation
 H361d - Suspected of damaging the unborn child
 H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
 H412 - Harmful to aquatic life with long lasting effects
 H226 - Flammable liquid and vapour

Physical hazards

Precautionary statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
 P243 - Take action to prevent static discharges
 P260 - Do not breathe vapour
 P273 - Avoid release to the environment
 P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
 P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

2.3. Other hazards
PBT/vPvB see section 12.5.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components

Chemical Name	EC-No	REACH Registration Number	CAS-No	Weight percent	GHS Classification
Styrene	202-851-5	01-2119457861-32	100-42-5	~ 56	Flam. Liq. 3 (H226) Repr. 2 (H361d) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Asp. Tox. 1 (H304) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Chronic 3 (H412)
Paraffin waxes and Hydrocarbon waxes	232-315-6	01-2119488076-30	8002-74-2	< 1	-
Amorphous Silica	231-545-4	01-2119379499-16	7631-86-9	< 1	-
Silica, amorphous, fumed, crystalline-free	231-545-4	01-2119379499-16	112945-52-5	< 0.5	-
2,4-dihydroxybenzophenone	205-029-4	01-2120041737-54	131-56-6	~ 0.2	Eye Irrit. 2 (H319) Repr. 2 (H361) Aquatic Chronic 2 (H411)
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate	229-934-9	01-2119451093-47	6846-50-0	~ 0.2	Repr. 2 (H361d) Aquatic Chronic 3 (H412)
Potassium 2-ethylhexanoate	221-625-7	01-2119980714-29	3164-85-0	~ 0.1	Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Repr. 2 (H361)
cobalt octoate	205-250-6	01-2119524678-29	136-52-7	~ 0.1	Skin Sens. 1A (H317) Eye Irrit. 2 (H319) Repr. 1B (H360Fd) Aquatic Acute 1 (H400) Aquatic Chronic 3 (H412)

For the full text of the H-Statements mentioned in this Section, see Section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance Do not breathe dust/fume/gas/mist/vapours/spray
Eye Contact	Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing. If symptoms persist, call a physician
Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes If skin irritation persists, call a physician

Inhalation	Move to fresh air If not breathing, give artificial respiration Consult a physician
Ingestion	Do NOT induce vomiting Rinse mouth. Consult a physician
Protection of first-aiders	Use personal protective equipment See section 8 for more information

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

Eye Contact	Irritating to eyes
Skin contact	Irritating to skin May cause sensitisation by skin contact
Inhalation	Harmful: danger of serious damage to health by prolonged exposure through inhalation Irritating to respiratory system
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

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

Notes to physician	No information available
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Dry chemical, Foam, Carbon dioxide (CO ₂), (closed systems)
Extinguishing Media Which Must not be Used for Safety Reasons	Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases	Vapours may form explosive mixtures with air. Most vapours are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) Heating or fire can release toxic gas : Carbon monoxide
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5.3. Advice for firefighters

Special protective equipment for fire-fighters	Wear self-contained breathing apparatus and protective suit.
Other information	Cool containers / tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Personal precautions

Remove all sources of ignition
Heat, flames and sparks.
Take precautionary measures against static charges.
Ensure adequate ventilation
Use personal protective equipment

For emergency responders

Avoid breathing vapours or mists In the event of fire and/or explosion do not breathe fumes. Use personal protective equipment

6.2. Environmental precautions**Environmental precautions**

The product should not be allowed to enter drains, water courses or the soil.
Do not flush into surface water or sanitary sewer system

6.3. Methods and material for containment and cleaning up**Methods for cleaning up**

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13)
Use clean non-sparking tools to collect absorbed material

6.4. Reference to other sections

See section 8 for more information
See Section 12 for additional Ecological Information

SECTION 7: Handling and storage7.1. Precautions for safe handling**Precautions for safe handling**

Avoid static electricity build up with connection to earth
Use only in area provided with appropriate exhaust ventilation
In case of insufficient ventilation, wear suitable respiratory equipment
For personal protection see section 8

Prevention of fire and explosion

Keep away from open flames, hot surfaces and sources of ignition Empty containers may contain flammable or explosive vapours

Hygiene measures

When using, do not eat, drink or smoke Wash hands before breaks and at the end of workday. Provide regular cleaning of equipment, work area and clothing

7.2. Conditions for safe storage, including any incompatibilities**Technical measures/Storage conditions**

Keep in a dry, cool and well-ventilated place.
Keep at temperature not exceeding 30°C
Keep away from heat and sources of ignition.

Materials to avoid

Strong oxidizing agents, Catalyst, Peroxides, Reducing agents

Packaging material

metallic GRP Tanks (Reinforced Glass Polyester)

Unsuitable materials for containers copper, Copper alloys, Bronze, Zinc

7.3. Specific end use(s)**Specific use(s)**

No information available

SECTION 8: Exposure controls/personal protection

8.1. Control parametersOccupational Exposure limits

Chemical Name	European Union	ACGIH OEL (Ceiling)	The United Kingdom	Ireland
Styrene 100-42-5	-	ACGIH (2020): TLV-TWA: 10 ppm TLV-STEL/C: 20 ppm Notes: OTO, A3, BEI Critical effects: CNS and hearing impairment, URT irr, peripheral neuropathy visual disorders	STEL 250 ppm STEL 1080 mg/m ³ TWA 100 ppm TWA 430 mg/m ³	TWA 20 ppm TWA 85 mg/m ³ STEL 40 ppm STEL 170 mg/m ³
Paraffin waxes and Hydrocarbon waxes 8002-74-2		TWA 2 mg/m ³	STEL 6 mg/m ³ TWA 2 mg/m ³	TWA 2 mg/m ³ STEL 6 mg/m ³
Amorphous Silica 7631-86-9			STEL 18 mg/m ³ STEL 7.2 mg/m ³ TWA 6 mg/m ³ TWA 2.4 mg/m ³	TWA 6 mg/m ³ TWA 2.4 mg/m ³
cobalt octoate 136-52-7		0.02 mg/m ³	STEL 0.3 mg/m ³ TWA 0.1 mg/m ³ Sen+	TWA 0.1 mg/m ³ Sensitizer

Special hazards arising from the substance or mixtureBiological standards**Derived No Effect Level (DNEL)**

Derived No Effect Level (DNEL)				
Styrene (100-42-5)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Systemic effect		406 mg/Kg bw/day	85 mg/m ³	
Workers - Acute Short Term - Local effect			306 mg/m ³	
Workers - Acute Short term - Systemic effect			289 mg/m ³	
General Population - Acute Short Term - Local effect			182.7 mg/m ³	
General Population - Acute Short Term - Systemic effect			174.2 mg/m ³	
General Population - Long Term - Systemic effect	2.1 mg/Kg bw/day	343 mg/Kg bw/day	10.2 mg/m ³	

Amorphous Silica (7631-86-9)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Systemic effect			4 mg/m ³	

Silica, amorphous, fumed, crystalline-free (112945-52-5)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Systemic effect			4 mg/m ³	

2,4-dihydroxybenzophenone (131-56-6)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Systemic effect		2.36 mg/kg bw/day	2.08 mg/m ³	
General Population - Long Term - Systemic effect	1.18 mg/kg bw/day	1.18 mg/kg bw/day	0.513 mg/m ³	

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate (6846-50-0)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark

Workers - Long Term - Systemic effect		5 mg/kg bw/day	17.62 mg/m ³	
General Population - Long Term - Systemic effect	5 mg/kg bw/day	5 mg/kg bw/day	4.35 mg/m ³	

Potassium 2-ethylhexanoate (3164-85-0)

Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Systemic effect		12 mg/kg bw/day	32 mg/m ³	
Workers - Long Term - Systemic effect	2.5 mg/kg bw/day	6 mg/kg bw/day	8 mg/m ³	

cobalt octoate (136-52-7)

Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Local effect			235.1 µg/m ³	
General Population - Long Term - Systemic effect	175 µg/kg bw/day			
General Population - Long Term - Local effect			37 µg/m ³	

Predicted No Effect Concentration (PNEC)**PNEC Component****Styrene (100-42-5)**

Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.028 mg/L
Marine water	PNEC Aqua	0.014 mg/L
Intermittent use/release	PNEC Aqua	0.04 mg/L
Fresh water	PNEC Sediment	0.614 mg/Kg.dw
Marine water	PNEC Sediment	0.307 mg/Kg.dw
Terrestrial Compartment	PNEC Soil	0.2 mg/Kg.dw
STP microorganisms	PNEC STP	5 mg/L

Amorphous Silica (7631-86-9)

Exposure	Type	PNEC
Secondary Poisoning	PNEC Oral	60000 mg/kg

Silica, amorphous, fumed, crystalline-free (112945-52-5)

Exposure	Type	PNEC
Secondary Poisoning	PNEC Oral	60000 mg/kg

2,4-dihydroxybenzophenone (131-56-6)

Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.033 mg/L
Marine water	PNEC Aqua	0.003 mg/L
	PNEC STP	0.914 mg/L
Fresh water	PNEC Sediment	35.12 mg/kg sediment dw
Marine water	PNEC Sediment	3.512 mg/kg sediment dw
	PNEC Soil	12.3 mg/kg soil dw

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate (6846-50-0)

Exposure	Type	PNEC
Marine water	PNEC Aqua	0.001 mg/L
Fresh water	PNEC Aqua	0.014 mg/L
	PNEC STP	3 mg/L
Fresh water	PNEC Sediment	5.29 mg/kg sediment dw
Marine water	PNEC Sediment	0.529 mg/kg sediment dw
	PNEC Soil	1.05 mg/kg soil dw

Potassium 2-ethylhexanoate (3164-85-0)		
Exposure	Type	PNEC
Marine water	PNEC Aqua	0.036 mg/L
Fresh water	PNEC Aqua	0.36 mg/L
Intermittent use/release	PNEC Aqua	0.493 mg/L
	PNEC STP	71.7 mg/L
Fresh water	PNEC Sediment	6.37 mg/kg sediment dw
Marine water	PNEC Sediment	0.637 mg/kg sediment dw
	PNEC Soil	1.06 mg/kg soil dw

cobalt octoate (136-52-7)		
Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.62 µg/L
Marine water	PNEC Aqua	2.36 µg/L
STP microorganisms	PNEC STP	0.37 mg/L
Fresh water	PNEC Sediment	53.8 mg/kg sediment dw
Marine water	PNEC Sediment	69.8 mg/kg sediment dw
Terrestrial Compartment	PNEC Soil	10.9 mg/kg soil dw

8.2. Exposure controls

Occupational exposure controls

Engineering measures

Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment

Personal protective equipment

General Information

Use personal protective equipment.

Respiratory protection

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) If exposure limits are likely to be exceeded / In case of insufficient ventilation wear suitable respiratory equipment :

Breathing apparatus with filter Type A (Organic gases and vapours filter conforming to EN 14387 , APF 40 < 1 hour, APF 200 > 1 hour) / Type A(2)/P3 in combination with Particulates filter conforming to EN 143 , if exposed to dust

Eye protection

Safety glasses with side-shields. Do not wear contact lenses.

Skin and body protection

Antistatic boots. Protective shoes or boots. Wear fire/flame resistant/retardant clothing.

Hand protection

Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training

Glove material : Neoprene , Nitriles , Viton (R) or Polyvinyl alcohol

Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Environmental exposure controls

Environmental exposure controls Do not allow material to contaminate ground water system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<u>Property</u>	<u>Values</u>	<u>Remark</u>
Appearance	pink	
Physical state	Liquid	
Particle size		no data available
Odour	Styrene	
Odour Threshold	0.15 ppm	Values related to styrene
pH		no data available
pH (as aqueous solution)		no data available

Melting point/range	- 30 °C	Values related to styrene
Freezing Point		no data available
Boiling point	145 °C	Values related to styrene
Flash point	31 °C	Values related to styrene
Evapouration rate		no data available
Flammability Limits in Air		
upper	6,1 - 6,8%	Values related to styrene
lower	0,9 -1,1%	Values related to styrene
Vapour pressure	6 hPa	20°C
Vapour density	3.6	Values related to styrene
Density	1.03 g/cm3	25°C
Water solubility		no data available
Partition coefficient: n-octanol/water	3	Values related to styrene
Autoignition temperature	490 °C	Values related to styrene
Decomposition temperature		no data available
Viscosity, kinematic	825 mm2/s	25°C
Viscosity, dynamic	850 mPa.s	25°C
Explosive properties		not applicable
Oxidizing properties		not applicable

9.2. Other information

<u>Property</u>	<u>Values</u>	<u>Remark</u>
Solubility in other solvents		no data available

SECTION 10: Stability and reactivity10.1. Reactivity

Reactivity Product may ignite and burn at temperatures exceeding the flash point

10.2. Chemical stability

Stability Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions In use, may form flammable/explosive vapour-air mixture.

Hazardous polymerisation Polymerisation can occur.

10.4. Conditions to avoid

Conditions to avoid Heat, flames and sparks.
Exposure to light.
Take precautionary measures against static charges.

10.5. Incompatible materials

Materials to avoid Strong oxidizing agents, Catalyst, Peroxides, Reducing agents

10.6. Hazardous decomposition products

Hazardous decomposition products Incomplete combustion and thermolysis produces potentially toxic gases such as carbon monoxide and carbon dioxide

SECTION 11: Toxicological information11.1. Information on toxicological effects**Acute toxicity**

Inhalation Harmful: danger of serious damage to health by prolonged exposure through inhalation
Irritating to respiratory system

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation	Read-across (Analogy)
Styrene 100-42-5	5000 mg/kg (Rat)	> 2000 mg/kg bw (Rat) 24h OECD 402	11.8 mg/L (Rat) 4h CSR	
Paraffin waxes and Hydrocarbon waxes 8002-74-2	> 5000 mg/kg bw (Rat) OECD 420	> 2000 mg/kg bw (Rat) OECD 402		
Amorphous Silica 7631-86-9	> 5000 mg/kg bw (Rat) OECD 401	> 5000 mg/kg (Rabbit)	> 0.14 mg/L air (Rat) 4h (analytical) OECD 403	
Silica, amorphous, fumed, crystalline-free 112945-52-5	> 5000 mg/kg bw (Rat) OECD 401	> 5000 mg/kg (Rabbit)	> 0.14 mg/L air (Rat) 4h (analytical) OECD 403	
2,4-dihydroxybenzophenone 131-56-6	8600 mg/kg bw (Rat) No guideline followed			
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	> 2000 mg/kg bw (Rat) OECD 425, EPA OPPTS 870.1100	> 2000 mg/kg bw (Rabbit) OECD 402		
Potassium 2-ethylhexanoate 3164-85-0	2043 mg/kg bw (Rat) OECD 401	> 2000 mg/kg bw (Rat) OECD 402	LC0 = 0.11 mg/L air (Rat, vapour) 8h OECD 436 Read across with 2-ethylhexanoic acid Cas N° : 149-57-5	
cobalt octoate 136-52-7	3129 mg/kg/bw (Rat) OECD 425	> 2000 mg/kg bw (Rat) OECD 402		

Skin corrosion/irritation

Chemical Name	Skin corrosion/irritation	Read-across (Analogy)
Styrene 100-42-5	Irritating to skin in vivo assay rabbit	
Paraffin waxes and Hydrocarbon waxes 8002-74-2	No skin irritation in vivo assay rabbit OECD 404	
Amorphous Silica 7631-86-9	No skin irritation rabbit OECD 404	
Silica, amorphous, fumed, crystalline-free 112945-52-5	No skin irritation rabbit OECD 404	
2,4-dihydroxybenzophenone 131-56-6	No skin irritation in vivo assay rabbit	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	No skin irritation in vivo assay rabbit OECD 404	
Potassium 2-ethylhexanoate 3164-85-0	Irritating to skin in vivo assay rabbit OECD 404	
cobalt octoate 136-52-7	No skin corrosion in vitro study OECD 431 EU Method B. 40	

Serious Eye Damage/Eye Irritation

Chemical Name	Serious Eye Damage/Eye Irritation	Read-across (Analogy)
Styrene 100-42-5	Irritating to eyes in vivo assay rabbit	

Paraffin waxes and Hydrocarbon waxes 8002-74-2	No eye irritation in vivo assay rabbit OECD 405	
Amorphous Silica 7631-86-9	No eye irritation rabbit OECD 405	
Silica, amorphous, fumed, crystalline-free 112945-52-5	No eye irritation rabbit OECD 405	
2,4-dihydroxybenzophenone 131-56-6	Mild eye irritation in vivo assay (rabbit) OECD 405	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	No eye irritation in vivo assay rabbit OECD 405	
Potassium 2-ethylhexanoate 3164-85-0	Ambiguous in vitro study Bovine OECD 437 EU Method B.47	
cobalt octoate 136-52-7	Moderate eye irritation OECD 437 EU Method B.47 Irritating to eyes rabbit OECD 405	

Respiratory or skin sensitisation May cause sensitisation by skin contact

Chemical Name	Respiratory or skin sensitisation	Read-across (Analogy)
Styrene 100-42-5	Does not cause skin sensitization Does not cause respiratory sensitization CSR	
Paraffin waxes and Hydrocarbon waxes 8002-74-2	Does not cause skin sensitization in vivo assay guinea pig OECD 406 EU Method B.6	
Amorphous Silica 7631-86-9	Does not cause skin sensitization Does not cause respiratory sensitization	
Silica, amorphous, fumed, crystalline-free 112945-52-5	Does not cause skin sensitization Does not cause respiratory sensitization	
2,4-dihydroxybenzophenone 131-56-6	Does not cause skin sensitization in vivo assay human data	
Potassium 2-ethylhexanoate 3164-85-0	Does not cause skin sensitization in vivo assay guinea pig OECD 406	2-ethylhexanoic acid Cas N° : 149-57-5
cobalt octoate 136-52-7	May cause sensitisation by skin contact in vivo assay mouse OECD 429	

Mutagenic Effects

in vitro study

Chemical Name	Ames test	Read-across (Analogy)
Styrene 100-42-5	Ambiguous In vitro gene mutation study in bacteria (S. typhimurium G46, TA1530, TA 1535, TA100, TA98, TA1538, TA 1537) OECD 471	

Paraffin waxes and Hydrocarbon waxes 8002-74-2	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98 and TA 100) (Escherichia coli WP2 uvrA) OECD 471	
Amorphous Silica 7631-86-9	negative In vitro gene mutation study in bacteria OECD 471	
Silica, amorphous, fumed, crystalline-free 112945-52-5	negative In vitro gene mutation study in bacteria OECD 471	
2,4-dihydroxybenzophenone 131-56-6	negative In vitro gene mutation study in bacteria (S. typhimurium, other: S. typhimurium TA 1535, TA 1537, TA 98, TA 100, TA 1538) OECD 471	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98 and TA 100) (Escherichia coli WP2 uvrA) EU Method B.13/14	
Potassium 2-ethylhexanoate 3164-85-0	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98 and TA 100) OECD 471	2-ethylhexanoic acid Cas N° : 149-57-5
cobalt octoate 136-52-7	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98, TA100 and TA 102) OECD 471	Cas N°: 68956-82-1, 14024-48-7

Chemical Name	In vitro Mammalian Cell Gene Mutation Test	Read-across (Analogy)
Styrene 100-42-5	Ambiguous In vitro gene mutation study in mammalian cells hamster OECD 476	
Paraffin waxes and Hydrocarbon waxes 8002-74-2	negative In vitro gene mutation study in mammalian cells mouse OECD 476	
Amorphous Silica 7631-86-9	negative In vitro gene mutation study in mammalian cells OECD 476	
Silica, amorphous, fumed, crystalline-free 112945-52-5	negative In vitro gene mutation study in mammalian cells OECD 476	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	negative In vitro gene mutation study in mammalian cells hamster OECD 476	
Potassium 2-ethylhexanoate 3164-85-0	negative In vitro gene mutation study in mammalian cells mouse hamster OECD 476 EPA OTS 798.5300	2-ethylhexanoic acid Cas N° : 149-57-5
cobalt octoate 136-52-7	negative In vitro gene mutation study in mammalian cells mouse OECD 476	Cas N°: 7440-48-4, 1308-06-1, 10124-43-3, 12016-80-7
Chemical Name	In vitro Mammalian Chromosome Aberration Test	Read-across (Analogy)
Styrene 100-42-5	positive Chromosome aberration test in vitro OECD 473 OECD 479	

Paraffin waxes and Hydrocarbon waxes 8002-74-2	negative Chromosome aberration test in vitro hamster similar to OECD 473	
Amorphous Silica 7631-86-9	negative Chromosome aberration test in vitro OECD 473	
Silica, amorphous, fumed, crystalline-free 112945-52-5	negative Chromosome aberration test in vitro OECD 473	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	negative Chromosome aberration test in vitro hamster similar to OECD 473 EU Method B.10 EPA OPPTS 870.5375	
Potassium 2-ethylhexanoate 3164-85-0	negative Chromosome aberration test in vitro OECD 473	2-ethylhexanoic acid Cas N° : 149-57-5

in vivo assay

Chemical Name	Unscheduled DNA Synthesis (UDS)	Read-across (Analogy)
Styrene 100-42-5	negative mouse OECD 486 OECD 474	
Paraffin waxes and Hydrocarbon waxes 8002-74-2	negative mouse similar to OECD 474	
Amorphous Silica 7631-86-9	negative rat	
Silica, amorphous, fumed, crystalline-free 112945-52-5	negative rat	
2,4-dihydroxybenzophenone 131-56-6	Data inconclusive mouse OECD 474	
Potassium 2-ethylhexanoate 3164-85-0	negative mouse OECD 474	
cobalt octoate 136-52-7	negative rat OECD 474 OECD 475	Cas N°: 68956-82-1, 14024-48-7, 10026-24-1

Carcinogenicity**Carcinogenicity****Styrene (100-42-5)**

Exposure routes	Method	Species	Dose	Evaluation
Inhalation	OECD 453	rat	NOAEC systemic (carcinogenicity) \geq 4.34 mg/L air (nominal)	negative
Inhalation	OECD 453	mouse	LOAEC (carcinogenicity) female/male = 0.09 - 0.18 mg/L air resp., NOAEC (carcinogenicity) male = 0.09 mg/L air	positive
Oral	No information available	rat	NOAEL (carcinogenicity) \geq 2000 mg/kg bw /day	positive
Oral	No information available	mouse	LOAEL (carcinogenicity) = 150 mg/kg bw /day	positive

Paraffin waxes and Hydrocarbon waxes (8002-74-2)

Exposure routes	Method	Species	Dose	Evaluation
Dermal		mouse	NOEL (carcinogenicity) = 128 mg/kg bw/day	negative

Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 453	rat	NOAEL = 1800 - 3200 mg/kg bw/day	negative

Silica, amorphous, fumed, crystalline-free (112945-52-5)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 453	rat	NOAEL = 1800 - 3200 mg/kg bw/day	negative

Reproductive toxicity

Reproductive toxicity				
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	No information available	rat	NOAEL/LOAEL (fertility) 60d = 100 - 200 mg/kg bw/day	positive
Oral	OECD 422	rat	NOAEL/LOAEL (fertility) 60d = 200 - 400 mg/kg bw/day	positive
Inhalation	OECD 416	rat	NOAEC (P, F1) = 0.64 mg/L air LOAEC (P, F1) = 2.13 mg/L air NOAEC (F2) = 0.21 mg/L air LOAEC (F2) = 0.64 mg/L air (70d)	negative

Paraffin waxes and Hydrocarbon waxes (8002-74-2)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 421	rat	NOAEL (p/ reproductive performance) >= 1000 mg/kg bw/day NOAEL Neonatal (F1) >= 1000 mg/kg bw/day Read across with : Chevron 100 Neutral	negative

Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 415	rat	NOAEL = 497 mg/kg bw/day	negative

Silica, amorphous, fumed, crystalline-free (112945-52-5)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 415	rat	NOAEL = 497 mg/kg bw/day	negative

1-isopropyl-2,2-dimethyltrimethylene diisobutryate (6846-50-0)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 421 EPA OPPTS 870.3550	rat	NOAEL (developmental and reproductive effects) = 276 - 359 mg/kg bw/day	negative
Oral	similar to OECD 422	rat	NOEL (embryo & fetal toxicity) = 750 mg/kg bw/day	negative

Potassium 2-ethylhexanoate (3164-85-0)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	Read-across (Analogy) 2-ethylhexanoic acid Cas N° : 149-57-5	rat	NOAEL (fertility) = 300 mg/kg bw/day	negative

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cobalt octoate (136-52-7)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	Read-across (Analogy) Cas N°: 7440-48-4 OECD 422	rat	NO(A)EL (P&F1) 28d = 30 mg/kg bw/day	positive

Developmental Toxicity Suspected of damaging the unborn child.

Developmental Toxicity				
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	No information available	rat	NOAEC/LOAEC (maternal toxicity + developmental toxicity) >50d = 1.08 - 2.15 mg/L air	positive
Inhalation	OECD 414	rat	LOAEC (maternal toxicity) 6-15d = 1.28 mg/L air	positive
Inhalation	OECD 414	rat	NOAEC (developmental toxicity) 6-15d >= 2.56 mg/L air	negative
Inhalation	OECD 414	rabbit	NOAEC (maternal toxicity + developmental toxicity) 6-18d = 2.56 mg/L air	negative

Paraffin waxes and Hydrocarbon waxes (8002-74-2)				
Exposure routes	Method	Species	Dose	Evaluation
Dermal	OECD 414	rat	LOAEL (maternal toxicity) = 125 mg/kg bw/day NOAEL (teratogenicity) >= 2000 mg/kg bw/day Read across with : 100 SUS solvent refined base oil	negative

Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rat	NOAEL (maternal toxicity) = 1350 mg/kg bw/day NOAEL (teratogenicity) = 1350 mg/kg bw/day	negative

Silica, amorphous, fumed, crystalline-free (112945-52-5)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rat	NOAEL (maternal toxicity) = 1350 mg/kg bw/day NOAEL (teratogenicity) = 1350 mg/kg bw/day	negative

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate (6846-50-0)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rabbit	NOAEL = 300 mg/kg bw/day	positive

Potassium 2-ethylhexanoate (3164-85-0)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	Read-across (Analogy) 2-ethylhexanoic acid Cas N° : 149-57-5	rat	NOAEL (maternal toxicity) = 300 mg/kg bw/day LOAEL (teratogenicity) = 100 mg/kg bw/day	negative

Specific target organ toxicity - single exposure May cause irritation of respiratory tract**Specific target organ toxicity - repeated exposure** Causes damage to organs through prolonged or repeated exposure , target organ(s) : Central nervous system , Ears

STOT - repeated exposure				
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Remarks
Inhalation	OECD 412	rat mouse	NOAEC male (28d) = 3.47 mg/L air NOAEC (ototoxicity) 28d = 2.13 mg/L air NOAEC (28d) = 0.181 mg/L air NOAEC (28d) = 0.688 mg/L air	
Inhalation	No information available	rat	NOAEC (nasal tract) = 0.85 mg/L air NOAEC (overall) = 2.13 mg/L air NOAEC (ototoxicity) = 0.85 mg/L air LOAEC (ototoxicity) = 3.41 mg/L air NOAEC (overall) = 2.13 mg/L air	
Oral	No information available	rat	NOAEL (toxicity) = 1000 mg/kg bw/day LOAEL (toxicity) = 2000 mg/kg bw/day	
Oral	No information available	mouse	NOAEL (toxicity) = 150 mg/kg bw /day LOAEL (toxicity) = 300 mg/kg bw /day	
Inhalation	OECD 453	rat	LOAEC local (toxicity) = 0.21 mg/L air	

Paraffin waxes and Hydrocarbon waxes (8002-74-2)				
Exposure routes	Method	Species	Dose	Remarks
Dermal	Read-across (Analogy) Cas N°: 64742-52-5 OECD 410	rabbit	NOAEL (28d) = 1000 mg/kg bw/day	
Oral	OECD 408	rat	NOAEL (Low melting point wax) = 1.5 mg/kg bw/day NOAEL (High melting point and high sulphur wax) = 1500 mg/kg bw/day 90d	
Dermal	Read-across (Analogy) : Lubricant Base Oils OECD 411	rat	NOAEL (13 weeks) > 2000 mg/kg bw/day	
Dermal	Read-across (Analogy) : MRD-87-016 similar to OECD 453	mouse	NOAEL (male) 24 months >= 150 mg/kg bw/day	

Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Remarks
Oral	OECD 408	rat	NOEL (highest dose) 4000 <= 4500 mg/kg bw/day 90d	
Inhalation	OECD 413	rat	NOEC = 1.3 mg/m ³ air NOEC < 1.3 mg/m ³ air 90d	
Dermal	No information available	rabbit	NOAEL >= 10000 mg/kg bw/day	

Silica, amorphous, fumed, crystalline-free (112945-52-5)				
Exposure routes	Method	Species	Dose	Remarks

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Oral	OECD 408	rat	NOEL (highest dose) 4000 <= 4500 mg/kg bw/day 90d	
Inhalation	OECD 413	rat	NOEC = 1.3 mg/m ³ air NOEC < 1.3 mg/m ³ air 90d	
Dermal	No information available	rabbit	NOAEL >= 10000 mg/kg bw/day	

2,4-dihydroxybenzophenone (131-56-6)

Exposure routes	Method	Species	Dose	Remarks
Oral		rat	NOAEL (90d) = 236 mg/kg bw/day	

Potassium 2-ethylhexanoate (3164-85-0)

Exposure routes	Method	Species	Dose	Remarks
Oral	Read-across (Analogy) Cas N°: 149-57-5 TSCA	rat	NOAEL (male) = 61 mg/kg/day NOAEL (female) = 71 mg/kg/day	
Oral	No information available	mouse	NOAEL (male) = 180 mg/kg/day NOAEL (female) = 205 mg/kg/day	

cobalt octoate (136-52-7)

Exposure routes	Method	Species	Dose	Remarks
Oral	Read-across (Analogy) cobalt dichloride hexahydrate OECD 408	rat	NOAEL (90d) = 3 mg/kg bw/day	

Aspiration hazard Due to the viscosity, this product does not present an aspiration hazard.

Other information None

SECTION 12: Ecological information

12.1. Toxicity

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not flush into surface water or sanitary sewer system

Acute aquatic toxicity - Component Information

Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates.	Toxicity to fish	Toxicity to microorganisms
Styrene 100-42-5	EC50 (72h) = 4.9 mg/L (Pseudokirchnerella subcapitata) EPA OTS 797.1050	EC50 (48h) = 4.7 mg/L (Daphnia magna) NOEC = 1.9 mg/L (Daphnia magna) OECD 202	LC50 (96h) = 4.02 - 10 mg/L (Pimephales promelas) OECD 203	EC (30min) = 500 mg/L (Activated sludge of a predominantly domestic sewage) OECD 209
Paraffin waxes and Hydrocarbon waxes 8002-74-2	NOEL (72h) >= 100 mg/L (Pseudokirchnerella subcapitata), Read across with : N100DW OECD 201	LL50 (48h) > 1000 mg/L (Daphnia magna) QSAR	LL50 (96h) > 1000 mg/L (Oncorhynchus mykiss) QSAR	LL50 (40h) > 1000 mg/L (Tetrahymena pyriformis) NOEL (40h) >= 1000 mg/L (Tetrahymena pyriformis) QSAR
Amorphous Silica 7631-86-9		EL50 (24h) >= 1000 mg/L (Daphnia magna) OECD 202	LC50 (96h) > 10000 mg/L (Brachydanio rerio) OECD 203	
Silica, amorphous, fumed, crystalline-free 112945-52-5		EL50 (24h) >= 1000 mg/L (Daphnia magna) OECD 202	LC50 (96h) > 10000 mg/L (Brachydanio rerio) OECD 203	

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2,4-dihydroxybenzophenone 131-56-6		LC50 (48h) = 7.86 mg/L (Daphnia sp.) NOEC (48h) = 4 mg/L (Daphnia sp.) OECD 202	LC50 (96h) = 3.7 mg/L (Oryzias latipes) NOEC (96h) = 1.6 mg/L (Oryzias latipes) OECD 203	IC50 (48h) = 9.14 mg/L (Tetrahymena pyriformis) No guideline followed
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	EC50 (72h) > 7.49 mg/L (Pseudokirchnerella subcapitata) NOEC (72h) = 3.56 mg/L (Pseudokirchnerella subcapitata) OECD 201	EC50 (48h) > 1.46 mg/L (Daphnia magna) NOEC (48h) >= 1.46 mg/L (Daphnia magna) Similar to EU Method C.2	LC50 (96h) > 1.55 mg/L (Pimephales promelas) NOEC (96h) > 6 mg/L (Lepomis macrochirus) Similar to OECD 203	
Potassium 2-ethylhexanoate 3164-85-0	EC50 (72h) = 49.3 mg/L (Desmodesmus subspicatus) OECD 201 Read across with 2-ethylhexanoic acid Cas N° : 149-57-5	EC50 (48h) = 910 mg/L (Daphnia magna) OECD 202 Read across with Cas N° : 16977-89-3	LC50 (96h) > 100 mg/L (Oryzias latipes) OECD 203 Read across with Cas N° : 16766-89-3	EC50 (17h) = 112.1 mg/L, EC10 (17h) = 71.7 mg/L (Pseudomonas putida) DIN 38412, part 8
cobalt octoate 136-52-7	EC50 (72h) = 144 µg Codiss./L (Pseudokirchnerella subcapitata) NOEC (72h) = 32.2 µg./L (Pseudokirchnerella subcapitata) LOEC (72h) = 52.7 µg Codiss./L (Pseudokirchnerella subcapitata) OECD 201		LC50 (96h) = 1.512 mg/L (Oncorhynchus mykiss) NOEC (96h) = 0.939 mg/L (Oncorhynchus mykiss) LOEC (96h) = 1.577 mg/L (Oncorhynchus mykiss) ASTM guideline (1996)	EC10 (30 min) = 3.73 mg/L (Activated sludge) EC50 (30 min) = 120 mg/L (Activated sludge) Read across with Cas N° : 7646-79-9 OECD 209

Chronic aquatic toxicity - Component Information

Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates.	Toxicity to fish	Toxicity to microorganisms
Styrene 100-42-5		NOEC (21d) = 1.01 mg/L (Daphnia magna) LOEC (21d) = 2.06 mg/L (Daphnia magna) EC50 (21d) = 1.88 mg/L (Daphnia magna) OECD 203		
Paraffin waxes and Hydrocarbon waxes 8002-74-2		NOEL (21d) >= 1000 mg/L (Daphnia magna) QSAR	NOEL (28d) >= 1000 mg/L (Oncorhynchus mykiss) QSAR	
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0		NOEC (21d) = 0.7 mg/L (Daphnia magna) Similar to OECD 211		
Potassium 2-ethylhexanoate 3164-85-0		NOEC (21d) = 25 mg/L (Daphnia magna) OECD 211		
cobalt octoate 136-52-7	EC50 (7d) = 90.1 µg./L (Lemna minor) NOEC (7d) = 3.0 µg/L (Lemna minor) LOEC (7d) = 8.8 µg/L (Lemna minor) OECD 221	NOECR (21d) = 60.8 µg./L (Daphnia magna) LC50 (21d) = 121.3 mg/L (Daphnia magna) LOECR (21d) = 93.3 µg Codiss./L (Daphnia magna) OECD 211		

Effects on terrestrial organisms - Component Information

Chronic toxicity				
Styrene (100-42-5)				
Chronic toxicity	Method	Species	Values	Remarks

Toxicity to invertebrates	OECD 207	Eisenia foetida	LC50 (14d) = 120 mg/kg soil dw LOEC (burrowing time and mean percent weight change) = 65 mg/kg soil dw LOEC (survival) = 180 mg/kg soil dw NOEC (mean percent weight change) = 34 mg/kg soil dw
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12.2. Persistence and degradability

Chemical Name	Biodegradation	Evaluation
Styrene 100-42-5	87% (20d) similar to OECD 301D	Readily biodegradable
Paraffin waxes and Hydrocarbon waxes 8002-74-2	31 % (28d) OECD 301F Read across with : MRD-94-981	Inherently biodegradable.
2,4-dihydroxybenzophenone 131-56-6	50% (360h) QSAR	Inherently biodegradable.
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	70.73 % (28d), (Activated sludge, domestic, non-adapted) OECD 301 B	Readily biodegradable
Potassium 2-ethylhexanoate 3164-85-0	> 70 % (99%) (28d), Read across with benzoic acid, sodium salt OECD 301E	Readily biodegradable
cobalt octoate 136-52-7	60% (> 10d), OECD 301 B	Readily biodegradable

12.3. Bioaccumulative potential

Bioconcentration factor (BCF)		
Styrene (100-42-5)		
Method	Species	Bioconcentration factor (BCF)
Calculation method		74

1-isopropyl-2,2-dimethyltrimethylene diisobutyrate (6846-50-0)		
Method	Species	Bioconcentration factor (BCF)
OECD 305	Lepomis macrochirus	1.95

Chemical Name	log Pow
Styrene 100-42-5	3
2,4-dihydroxybenzophenone 131-56-6	2.964
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	4.91
Potassium 2-ethylhexanoate 3164-85-0	2.96

12.4. Mobility in soil

Chemical Name	LogKoc	Koc
Styrene 100-42-5	2.55	352
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	2.69	-

12.5. Results of PBT and vPvB assessment

Chemical Name	PBT	vPvB
Styrene 100-42-5	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

Paraffin waxes and Hydrocarbon waxes 8002-74-2	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
Amorphous Silica 7631-86-9	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
Silica, amorphous, fumed, crystalline-free 112945-52-5	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
2,4-dihydroxybenzophenone 131-56-6	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
1-isopropyl-2,2-dimethyltrimethylene diisobutyrate 6846-50-0	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects

None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from Residues/Unused Products	Dispose of in accordance with the European Directives on waste and hazardous waste. Do not flush into surface water or sanitary sewer system
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal.
Other information	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

14.1. UN number

ADR/RID	UN1866
IMDG/IMO	UN1866
ICAO/IATA	UN1866
ADN	UN1866

14.2. UN proper shipping name

ADR/RID	Resin solution UN1866, RESIN SOLUTION, 3, PG III, (D/E)
IMDG/IMO	Resin solution UN1866, RESIN SOLUTION, 3, PG III, (31°C c.c.)
ICAO/IATA	UN1866, RESIN SOLUTION, 3, PG III
ADN	Resin solution UN1866, RESIN SOLUTION, 3, PG III

14.3. Transport hazard class(es)

ADR/RID

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Hazard class	3
IMDG/IMO	
Hazard class	3
ICAO/IATA	
Hazard class	3
ADN	
Hazard class	3

14.4. Packing group

ADR/RID	III
IMDG/IMO	III
ICAO/IATA	III
ADN	III

14.5. Environmental hazards

ADR/RID	No
IMDG/IMO	No
Marine pollutant	No
ICAO/IATA	No
ADN	No

14.6. Special precautions for user

ADR/RID	
Classification Code	F1
Tunnel restriction code	(D/E)
Limited quantity	5 L
IMDG/IMO	
EmS	F-E, S-E
Limited quantity	5 L
ICAO/IATA	
ERG Code	3L
Limited quantity	10 L
ADN	
Classification Code	F1
Limited quantity	5 L
ventilation	VE01

Special precautions for users

Special precautions No information available14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**Transport in bulk according to MARPOL 73/78 and the IBC Code** not applicable**SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation (EC) No. 1907/2006 (REACH)
 Regulation (EC) No. 1272/2008 (CLP)
 Regulation (EU) No. 830/2015
 Directive 88/642/EEC
 Directive 98/24/EC
 Directive 1999/92/EC
 Directive 2012/18/EU

The mixture is subject to restrictions on use, see Annex XVII of the Regulation 1907/2006/EC (REACH): Column 1, n° 3; Column 1, n° 40.

European Union

Chemical Name	2012/18/EU (SEVESO) - §9	2012/18/EU (SEVESO) - §6, §7
Styrene - 100-42-5	50000	5000 tonnes 50000 tonnes

National regulatory information

The United Kingdom

Avoid exceeding of the given occupational exposure limits (see section 8).

Ireland

Avoid exceeding of the given occupational exposure limits (see section 8).

15.2. Chemical safety assessment

Chemical Safety Assessment Yes
Exposure scenario Relevant information for risk control are communicated in the form of exposure scenario attached to the safety data sheet.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3

H226 - Flammable liquid and vapour
 H304 - May be fatal if swallowed and enters airways
 H315 - Causes skin irritation
 H317 - May cause an allergic skin reaction
 H318 - Causes serious eye damage
 H319 - Causes serious eye irritation
 H332 - Harmful if inhaled
 H335 - May cause respiratory irritation
 H360Fd - May damage fertility. Suspected of damaging the unborn child
 H361 - Suspected of damaging fertility or the unborn child
 H361d - Suspected of damaging the unborn child
 H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
 H400 - Very toxic to aquatic life
 H411 - Toxic to aquatic life with long lasting effects
 H412 - Harmful to aquatic life with long lasting effects

Training Advice Handle in accordance with good industrial hygiene and safety practice. To avoid risks to man and the environment, comply with the instructions for use.

Sources of key data used to compile the datasheet ECHA

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Revision Note SDS sections updated : 1 , 2

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Scenario 1: Manufacturing of UP/VE resins and formulated resins (Gelcoat, Colour Paste, Putty, Bonding paste/Adhesive) (ES1)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The following scenarios contribute to the scenario *Manufacturing of UP/VE resins and formulated resins (Gelcoat, Colour Paste, Putty, Bonding paste/Adhesive)*.

This document has been prepared using REACH-Practical-Guide-on-Safe-Use-Information-for-Mixtures-under-REACH-The-LCID-Methodology, considering exposure scenario of relevant raw materials contained in the mixture.

The corresponding release to the environment, exposure of workers resulting from these contributing scenarios is summarized below.

Table 1. Description of ES 1

Free short title	Manufacturing of UP/VE resins and formulated resins (Gelcoat, Colour Paste, Putty, Bonding paste/Adhesive) (ES1)
Systematic title based on use descriptor	ERC 2; PROC 1, 3, 4, 5, 8a, 8b, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 2 – Formulation into mixture
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 1 - Chemical production in closed process</p> <p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 4 - Chemical production where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities</p> <p>PROC 8b - Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC 9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</p> <p>PROC 15 - Use of laboratory reagents in small scale laboratories</p>
Contributing Scenario (1) controlling environmental exposure for ERC 2	
Operational conditions (referred to styrene)	
Daily amount used at site	45700 kg/day (referred to styrene)

Release times per year	300 days/year (<i>justification: Continuous release</i>)
Local freshwater dilution factor	41
Local marine water dilution factor	100
Release fraction to air from process	0.102 %
Release fraction to wastewater from process	0.00063 %
Release fraction to soil from process	0.0025 %
Fraction tonnage to region	10 %
Fraction used at main source	60 %
STP	yes
River flow rate	18000 m ³ /day
Municipal sewage treatment plant discharge	2000000 L/day
Other modified EUSES values (referred to styrene)	
Fraction released to agricultural soil (Femis.agric)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to industrial soil (Femis.ind)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to waste water (Femis.water)	0.00063 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction released to air (Femis.air)	0.102 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction used at main source	60 % (<i>justification: Value adopted to account for Worst-case European manufacturing site</i>)
Fraction of emission directed to water by local STP (Fstp.water)	0.081 - (<i>justification: Efficiency STP 91.9%</i>)
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in contained batch processes. Closed processes
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines. Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %

Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Bulk transfers. Receipt and storage of raw materials in bulk or as packed goods, indoor and outdoor; Raw material assembly and charging; dispensing of liquids and solids via pipeline;
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines; Use bulk or semi-bulk handling systems. Drain down and flush system prior to equipment break-in or maintenance. Provide extract ventilation to points where emissions occur. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 min.-1 hour
Frequency of use	5 days / week

Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Dissolving linear UP/VE polymer in blending vessel (or dissolver)
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines; Drain down and flush system prior to equipment break-in or maintenance. Apply vessel entry procedures including use of forced supplied air. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Equipment cleaning and maintenance. Cleaning and maintenance of blending vessel, roadtankers etc.
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines. Drain or remove substance from equipment prior to break-in or maintenance. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes

Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (6) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Material transfers. All internal transport. Raw material assembly and charging / raw material dispensing of liquids and solids manually from bulk storage or packed goods into blending tank.
Qualitative Risk Assessment	
General	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Provide extract ventilation to points where emissions occur. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	Good (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur

Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (7) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Process sampling.
Qualitative Risk Assessment	
General	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour): Avoid dip sampling. Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 min.-1 hour
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	Good (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (8) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)

Scenario subtitle	Drum/batch transfers; Pouring from small containers; Transfer from/pouring from containers; Mixing operations (open systems). Mixing liquid and solid components / into final formulated resin in blending vessel
Qualitative Risk Assessment	
General	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Keep lids of containers closed during blending. Ensure good work practices are implemented. Provide basic employe training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (9) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment cleaning and maintenance. Cleaning and maintenance of pipes, pumps, filters, etc.
Qualitative Risk Assessment	

General	<p>Drain down system prior to equipment break-in or maintenance.</p> <p>Drain or remove substance from equipment prior to break-in or maintenance.</p> <p>Ensure good work practices are implemented</p> <p>Provide basic employe training to prevent/minimize exposures</p> <p>Wear suitable coveralls to prevent exposure to the skin.</p> <p>Use suitable eye protection.</p> <p>Use suitable chemically resistant gloves, tested to EN374.</p> <p>In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (10) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	<p>Disposal of wastes.</p> <p>Handling of non cured waste;</p> <p>Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment</p>
Qualitative Risk Assessment	

General	<p>Provide a good standard of general ventilation. Controlled ventilation means air is supplied or removed by a powered fan. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Dispose of empty containers and wastes safely. Dispose of waste in accordance with environmental legislation. Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness. Use suitable eye protection.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	<1 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	Indoors/outdoor
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Contributing Scenario (11) controlling industrial worker exposure for PROC 8b	
Name of contributing scenario	8b -Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	<p>Bulk transfers. All activities related to transport finished product to customer. Dispensing final UP/VE resin (linear UP/VE polymer + styrene + additives) into roadtanker</p>
Qualitative Risk Assessment	

General	<p>Fill containers/cans at dedicated fill points supplied with local extract ventilation.</p> <p>Ensure good work practices are implemented</p> <p>Provide basic employe training to prevent/minimize exposures</p> <p>Use suitable chemically resistant gloves, tested to EN374.</p> <p>Use suitable eye protection.</p> <p>In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (12) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 -Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	<p>Bulk transfers.</p> <p>All activities related to transport finished product to customer.</p> <p>Dispensing final UP/VE resin (linear UP/VE polymer + styrene + additives) / into storage tank, IBC, drum or pail.</p>
Qualitative Risk Assessment	

General	Fill containers/cans at dedicated fill points supplied with local extract ventilation. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (13) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Laboratory activities. All laboratory activities. Quality control work of samples from reactor and blending vessel. R&D work including handling of samples from 1 kg to 1 drum.
Qualitative Risk Assessment	
General	Carry out in a vented booth or extracted enclosure. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Scenario 2: FRP manufacturing in an industrial setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES2)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The following scenarios contribute to the scenario *FRP manufacturing in an industrial setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.)*.

This document has been prepared using REACH-Practical-Guide-on-Safe-Use-Information-for-Mixtures-under-REACH-The-LCID-Methodology, considering exposure scenario of relevant raw materials contained in the mixture.

The corresponding release to the environment, exposure of workers resulting from these contributing scenarios is summarized below.

Table 2. Description of ES 2

Free short title	FRP manufacturing in an industrial setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES2)
Systematic title based on use descriptor	ERC 6D; PROC 3, 5, 7, 8A, 10, 13, 14, 15
Name of contributing environmental scenario and corresponding ERC	ERC 6d Production of resins
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>PROC 7 - Industrial spraying</p> <p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 15 - Use of laboratory reagents in small scale laboratories</p>
Contributing Scenario (1) controlling environmental exposure for ERC 6D	
Operational conditions (referred to styrene)	
Daily amount used at site	161000 kg/day (referred to styrene)
Release times per year	300 days/year (justification: Continuous release)
Local freshwater dilution factor	10

Local marine water dilution factor	100
Release fraction to air from process	0.102 %
Release fraction to wastewater from process	0.00063 %
Release fraction to soil from process	0.025 %
Fraction tonnage to region	10 %
Fraction used at main source	60 %
STP	yes
River flow rate	18000 m ³ /day
Municipal sewage treatment plant discharge	2000000 L/day
Other modified EUSES values	
Fraction released to agricultural soil (Femis.agric)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to industrial soil (Femis.ind)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to waste water (Femis.water)	0.00063 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction released to air (Femis.air)	0.102 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction used at main source	60 % (<i>justification: Value adopted to account for Worst-case European manufacturing site</i>)
Fraction of emission directed to water by local STP (Fstp.water)	0.081 - (<i>justification: Efficiency STP 91.9%</i>)
Contributing Scenario (2) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Material transfers; Automated process with (semi) closed systems; Use in contained batch processes. Resin injection and transfer processes, such as vacuum infusion, RTM, impregnation of sewer relining sleeves
Qualitative Risk Assessment	
General	Put lids on containers immediately after use. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)

Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Material transfers. Product delivery/storage - delivery of bulk and packaged products - outdoor / indoor
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no

Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Drum/batch transfers; Pouring from small containers; Transfer from/pouring from containers; Mixing operations (open systems). Loading of mixing equipment; Preparation of material for application; (liquid products) - batch, indoor
Qualitative Risk Assessment	
General	Put lids on containers immediately after use. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Contributing Scenario (5) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Casting operations; Mixing operations (open systems). Casting and mixing operations in (semi-) open containers. Examples are centrifugal casting, casting of polymer concrete and artificial marble and the manufacturing of SMC / BMC/ TMC, etc
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	5-60%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occur
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)

Scenario subtitle	General exposures (closed systems). Mixing liquid and solid components / into final formulated resin in blending vessel; Examples are gelcoat blending and compounding, formulation of repair putties, bonding pastes, chemical anchoring, etc
Qualitative Risk Assessment	
General	Put lids on containers immediately after use. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Spraying; Spraying (automatic/robotic) All open mould applications where resins is applied by automated spraying or by robot in a spray cabin without direct worker involvement. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding

Qualitative Risk Assessment	
General	<p>Ensure the ventilation system is regularly maintained and tested</p> <p>Dispose of empty containers and wastes safely</p> <p>Ensure good work practices are implemented</p> <p>Provide basic employee training to prevent/minimize exposures</p> <p>Wear suitable coveralls to prevent exposure to the skin</p> <p>Use suitable eye protection.</p> <p>Wear suitable face shield</p> <p>Wear chemically resistant gloves tested to EN374, in combination with intensive management supervision control.</p> <p>In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Carry out in a vented booth or extracted enclosure	inhalation: 95 % (<i>justification: Carry out in a vented booth or extracted enclosure</i>)
Contributing Scenario (8) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	<p>Spraying;</p> <p>Spraying (manually)</p> <p>All open mould applications where resins is applied by manual spraying in an open work environment. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding</p>
Qualitative Risk Assessment	

General	Carefully pour from containers Use long handled tools where possible Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin Wear chemically resistant gloves tested to EN374 in combination with intensive management supervision control. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Yes
Local exhaust ventilation	inhalation: 95 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (9) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment maintenance; Maintenance of small items. Equipment cleaning and maintenance
Qualitative Risk Assessment	

General	<p>Drain or remove substance from equipment prior to break-in or maintenance.</p> <p>Ensure good work practices are implemented</p> <p>Provide basic employe training to prevent/minimize exposures</p> <p>Use suitable eye protection.</p> <p>Use suitable chemically resistant gloves, tested to EN374.</p> <p>Wear suitable coveralls to prevent exposure to the skin.</p> <p>In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (10) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	<p>Disposal of wastes.</p> <p>Handling of non cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment</p>
Qualitative Risk Assessment	

General	Put lids on containers immediately after use. Contain and dispose of waste according to local regulations Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	Indoors/outdoor
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Rolling, Brushing; Roller, spreader, flow application All open mould applications where resins is applied by brushing, rolling and other low energy spreading operations; Examples are handlamination, gelcoatbrushing, filament winding
Qualitative Risk Assessment	

General	Use long handled brushes and rollers where possible Ensure the ventilation system is regularly maintained and tested Dispose of empty containers and wastes safely Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occur
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (12) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Dipping, immersion and pouring; Rolling, Brushing; Roller, spreader, flow application Application of repair putties; Application of bonding pastes / adhesives.
Qualitative Risk Assessment	

General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (13) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Dipping, immersion and pouring; Continuous process. Continuous processes with open impregnation steps, such as pultrusion with open impregnation baths and (semi-) continuous production of flat laminates
Qualitative Risk Assessment	

General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (14) controlling industrial worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation
Scenario subtitle	Material transfers; Production or preparation or articles by tableting, compression, extrusion or pelletisation; Treatment by heating; Batch processes at elevated temperatures. Processes where curing of UP / VE resins takes place at high temperature. Examples are pultrusion with injection dies and processing of SMC / BMC / TMC, etc
Qualitative Risk Assessment	

General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures In case of potential exposure: Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (15) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Laboratory activities. Quality control work of samples from blending vessel; R&D work including handling of samples from 1 kg to 1 drum
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid

Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	No
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Scenario 3: FRP manufacturing in a professional setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES3)

This scenario is described by the following combinations of use descriptors. The corresponding contributing scenarios are described in the respective subchapters.

An overall exposure scenario may be described by a number of contributing scenarios which may be subdivided into environmental exposure, worker exposure and consumer exposure.

The following scenarios contribute to the scenario *FRP manufacturing in a professional setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.)*.

This document has been prepared using REACH-Practical-Guide-on-Safe-Use-Information-for-Mixtures-under-REACH-The-LCID-Methodology, considering exposure scenario of relevant raw materials contained in the mixture.

The corresponding release to the environment, exposure of workers resulting from these contributing scenarios is summarized below.

Table 2. Description of ES 3

Free short title	FRP manufacturing in a professional setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES8)
Systematic title based on use descriptor	ERC 6C; PROC 3, 4, 5, 8A, 10, 11
Name of contributing environmental scenario and corresponding ERC	ERC 6c Production of plastics
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 11 - Non industrial spraying</p>
Contributing Scenario (1) controlling environmental exposure for ERC 6C	
Operational conditions (<i>referred to styrene</i>)	
Daily amount used at site	48300 kg/day (<i>referred to styrene</i>)
Release times per year	300 days/year (<i>justification: Continuous release</i>)
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	0.102 %
Release fraction to wastewater from process	0.000012 %

Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	60 %
STP	Yes
River flow rate	18000 m ³ /day
Municipal sewage treatment plant discharge	2000000 L/day
Other modified EUSES values	
Fraction released to agricultural soil (Femis.agric)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to industrial soil (Femis.ind)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to waste water (Femis.water)	0.000012 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction released to air (Femis.air)	0.102 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction used at main source	60 % (<i>justification: Value adopted to account for worst-case European manufacturing site</i>)
Fraction of emission directed to water by local STP (Fstp.water)	0.081 - (<i>justification: Efficiency STP 91.9%</i>)
Contributing Scenario (2) controlling professional worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in contained batch processes. Application of chemical anchoring
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures In case of potential exposure: Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²

Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	No
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Contributing Scenario (3) controlling professional worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in contained batch processes. Sewer relining operation
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	No
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs

Contributing Scenario (4) controlling professional worker exposure for PROC 5

Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Material transfers; Pouring from small containers. Preparation of material for application (liquids) - transfer of material from one container to another; Formulating / blending resins, gelcoats, bonding pastes, putties etc. in blending vessels
Qualitative Risk Assessment	
General	Use drum pumps. Put lids on containers immediately after use. Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness

Contributing Scenario (5) controlling professional worker exposure for PROC 8A

Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment maintenance; Maintenance of small items. Equipment cleaning and maintenance
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (6) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Disposal of wastes. Handling of non cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment
Qualitative Risk Assessment	

General	Dispose of empty containers and wastes safely Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (7) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Rolling, Brushing; Roller, spreader, flow application All open mould applications where resins is applied by brushing, rolling and other low energy spreading operations; Examples are handlamination, gelcoatbrushing, semi-continuous production of flat panels and laminates
Qualitative Risk Assessment	

General	Use long handled brushes and rollers where possible Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (8) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Dipping, immersion and pouring; Rolling, Brushing; Roller, spreader, flow application Application of repair putties; Application of bonding pastes / adhesives.
Qualitative Risk Assessment	

General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Contributing Scenario (9) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Dipping, immersion and pouring; Rolling, Brushing; Roller, spreader, flow application Application of floorings, mastics, coatings, castings
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (10) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Spraying; Spraying (manually) All open mould applications where resins is applied by manual spraying in an open work environment. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding
Qualitative Risk Assessment	
General	Keep people not involved in the activity, away from the operation Ensure good work practices are implemented Provide basic employe training to prevent/minimize exposures Use suitable eye protection. Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves, tested to EN374, in combination with intensive management supervision control. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid

Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness