# SAFETY DATA SHEET

**according to Regulation (EC) No. 1907/2006**



# NORSODYNE H 88204 TAF

**Former date** 15-Dec-2022 **Revision date** 29-Aug-2023 **Version:** 4.1

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

### 1.1. Product identifier

| | |
|---|---|
| **Product name** | **NORSODYNE H 88204 TAF** |
| **Chemical Name** | **Unsaturated polyester resin** |
| **Trade name** | NORSODYNE H 88204 TAPF;SYNOLAC 6417 CLASS I;NORSODYNE 6417 |
| **Pure substance/mixture** | Mixture |
| **Unique Formula Identifier (UFI)** | UJQ3-K0QU-4002-E2JW |

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

**Identified uses** Resins for 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 : 0344 892 0111
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 identification

### 2.1. 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 - (H317) |
| Reproductive Toxicity | Category 2 - (H361d) |
| Carcinogenicity | Category 2 - (H351) |
| Specific Target Organ Toxicity (Single Exposure) | Category 3 - (H335) |
| Specific target organ toxicity - repeated exposure | Category 1 - (H372) |
| Flammable liquids | Category 3 - (H226) |

### 2.2. Label elements

Contains cobalt octoate, diantimony trioxide, 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
H351 - Suspected of causing cancer
H361d - Suspected of damaging the unborn child
H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
Physical hazards
H226 - Flammable liquid and vapour

**EU H -Phrases**

EUH208 - Contains phthalic anhydride- May produce an allergic reaction.

**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
P280 - Wear protective gloves/protective clothing/eye protection/face protection
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
P308 + P313 - IF exposed or concerned: Get medical advice/attention
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 | M-Factor (acute) | M-Factor (chronic) | Concentration limit (%) |
|---|---|---|---|---|---|---|---|---|
| Styrene | 202-851-5 | 01-2119457861-32 | 100-42-5 | 20 - < 25 | Flam. Liq. 3 (H226)<br>Repr. 2 (H361d)<br>Acute Tox. 4 (H332)<br>Skin Irrit. 2 (H315)<br>Eye Irrit. 2 (H319)<br>Asp. Tox. 1 (H304)<br>STOT SE 3 (H335)<br>STOT RE 1 (H372)<br>Aquatic Chronic 3 (H412) | | | |
| Aluminum hydroxide | 244-492-7 | 01-2119529246-39 | 21645-51-2 | > 15 | - | | | |
| diantimony trioxide | 215-175-0 | 01-2119475613-35 | 1309-64-4 | 7 - 9 | Carc. 2 (H351) | | | |
| Zinc borate | 235-804-2 | No data available | 138265-88-0 | 0.1 - < 1 | Aquatic Acute 1 (H400) | | | |
| phthalic anhydride | 201-607-5 | 01-2119457017-41 | 85-44-9 | 0.1 - < 1 | Acute Tox. 4 (H302)<br>Skin Irrit. 2 (H315)<br>Skin Sens. 1 (H317)<br>Eye Dam. 1 (H318)<br>Resp. Sens. 1 (H334)<br>STOT SE 3 (H335) | | | |
| Silica, amorphous, fumed, crystalline-free | 231-545-4 | 01-2119379499-16 | 112945-52-5 | 0.1 - < 1 | - | | | |
| cobalt octoate | 205-250-6 | 01-2119524678-29 | 136-52-7 | 0.1 - < 0.3 | Skin Sens. 1A (H317)<br>Eye Irrit. 2 (H319)<br>Repr. 1B (H360Fd)<br>Aquatic Acute 1 (H400)<br>Aquatic Chronic 3 (H412) | 1 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hydroquinone | 204-617-8 | 01-2119524016-51 | 123-31-9 | 0.01 - < 0.1 | Acute Tox. 4 (H302)<br>Eye Dam. 1 (H318)<br>Skin Sens. 1 (H317)<br>Muta. 2 (H341)<br>Carc. 2 (H351)<br>Aquatic acute 1 (H400)<br>Aquatic Chronic 1 (H410) | 10 | 1 | |

**Additional information** Acute Toxicity Estimate See Section 11 for more information

**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
May produce an allergic reaction.

**Ingestion** Harmful if swallowed.
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

## 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

### 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 storage

### 7.1. 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, Peroxides, Reducing agents

**Packageing 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 parameters

**Occupational Exposure limits**

| Chemical Name | European Union | ACGIH OEL (Ceiling) | The United Kingdom | Ireland |
|---|---|---|---|---|
| Styrene<br>100-42-5 | - | ACGIH (2020):<br>TLV-TWA: 10 ppm<br>TLV-STEL/C: 20 ppm<br>Notes: OTO, A3, BEI<br>Critical effects: CNS and hearing impairment, URT irr, peripheral neuropathy visual disorders | STEL 250 ppm STEL 1080 mg/m³<br>TWA 100 ppm TWA 430 mg/m³ | TWA 20 ppm TWA 85 mg/m³<br>STEL 40 ppm STEL 170 mg/m³ |
| Aluminum hydroxide<br>21645-51-2 | | | STEL 30 mg/m³ STEL 12 mg/m³ TWA 10 mg/m³ TWA 4 mg/m³ | We are not aware of any national exposure limit. |
| diantimony trioxide<br>1309-64-4 | | | STEL 1.5 mg/m³ TWA 0.5 mg/m³ | TWA 0.5 mg/m³ |
| phthalic anhydride<br>85-44-9 | | TWA 1 ppm | STEL 12 mg/m³ TWA 4 mg/m³ Sen+ | TWA 4 mg/m³ STEL 12 mg/m³ Sensitizer |
| cobalt octoate<br>136-52-7 | | 0.02 mg/m³ | STEL 0.3 mg/m³ TWA 0.1 mg/m³ Sen+ | TWA 0.1 mg/m³ Sensitizer |
| Hydroquinone<br>123-31-9 | | TWA 1 mg/m³ | STEL 1.5 mg/m³ TWA 0.5 mg/m³ | TWA 0.5 mg/m³ |

**Special hazards arising from the substance or mixture**

**Biological standards**

| Chemical Name | European Union | The United Kingdom | Ireland |
|---|---|---|---|
| Zinc borate<br>138265-88-0 | TLV - TWA: 10 mg/m³ (ACGIH)<br>TLV - TWA: 5 mg/m³ | We are not aware of any national exposure limit. | We are not aware of any national exposure limit. |

**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/m³ | |

| | | | | |
|---|---|---|---|---|
| Workers - Acute Short Term - Local effect | | | 306 mg/m³ | |
| Workers - Acute Short term - Systemic effect | | | 289 mg/m³ | |
| General Population - Acute Short Term - Local effect | | | 182.7 mg/m³ | |
| General Population - Acute Short Term - Systemic effect | | | 174.2 mg/m³ | |
| General Population - Long Term - Systemic effect | 2.1 mg/Kg bw/day | 343 mg/Kg bw/day | 10.2 mg/m³ | |

| **Aluminum hydroxide (21645-51-2)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Local effect | | | 3.59 mg/m³ | |
| General Population - Long Term - Systemic effect | 2.37 mg/kg bw/day | | | |

| **diantimony trioxide (1309-64-4)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Local effect | | | 0.5 mg/m³ | |
| Workers - Long Term - Systemic effect | | 281 mg/kg bw/day | | |
| General Population - Long Term - Local effect | | | 0.1 mg/m³ | |
| General Population - Long Term - Systemic effect | 168.6 mg/kg bw/day | 168.6 mg/kg bw/day | | |

| **phthalic anhydride (85-44-9)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Systemic effect | | 10 mg/kg bw/day | 32.2 mg/m³ | |
| General Population - Long Term - Systemic effect | 5 mg/kg bw/day | 5 mg/kg bw/day | 8.6 mg/m³ | |

| **Silica, amorphous, fumed, crystalline-free (112945-52-5)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Systemic effect | | | 4 mg/m³ | |

| **cobalt octoate (136-52-7)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Local effect | | | 235.1 µg/m³ | |
| General Population - Long Term - Systemic effect | 175 µg/kg bw/day | | | |
| General Population - Long Term - Local effect | | | 37 µg/m³ | |

| **Hydroquinone (123-31-9)** | | | | |
|---|---|---|---|---|
| Type | DNEL oral | DNEL dermal | DNEL inhalation | Remark |
| Workers - Long Term - Systemic effect | | 128 mg/kg bw/day | 7 mg/m³ | |
| Workers - Long Term - Local effect | | | 1 mg/m³ | |
| General Population - Long Term - Systemic effect | | 64 mg/kg bw/day | 1.74 mg/m³ | |

| | | | | |
|---|---|---|---|---|
| General Population - Long Term - Local effect | | | 0.5 mg/m³ | |

**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 |

| **Aluminum hydroxide (21645-51-2)** | | |
|---|---|---|
| Exposure | Type | PNEC |
| | PNEC STP | 20 mg/L |

| **diantimony trioxide (1309-64-4)** | | |
|---|---|---|
| Exposure | Type | PNEC |
| Marine water | PNEC Aqua | 0.0113 mg/L |
| Fresh water | PNEC Aqua | 0.113 mg/L |
| | PNEC STP | 2.55 mg/L |
| Fresh water | PNEC Sediment | 11.2 mg/kg sediment dw |
| Marine water | PNEC Sediment | 2.24 mg/kg sediment dw |
| | PNEC Soil | 37 mg/kg soil dw |

| **phthalic anhydride (85-44-9)** | | |
|---|---|---|
| Exposure | Type | PNEC |
| Fresh water | PNEC Aqua | 1 mg/L |
| Marine water | PNEC Aqua | 0.1 mg/L |
| Intermittent use/release | PNEC Aqua | 5.6 mg/L |
| | PNEC STP | 10 mg/L |
| Fresh water | PNEC Sediment | 3.8 mg/kg sediment dw |
| Marine water | PNEC Sediment | 0.38 mg/kg sediment dw |
| Terrestrial Compartment | PNEC Soil | 0.173 mg/kg soil dw |

| **Silica, amorphous, fumed, crystalline-free (112945-52-5)** | | |
|---|---|---|
| Exposure | Type | PNEC |
| Secondary Poisoning | PNEC Oral | 60000 mg/kg |

| **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 |

| **Hydroquinone (123-31-9)** | | |
|---|---|---|
| Exposure | Type | PNEC |
| Fresh water | PNEC Aqua | 0.114 µg/L |
| Marine water | PNEC Aqua | 0.0114 µg/L |
| Fresh water | PNEC Sediment | 0.98 µg/kg sediment dw |
| Marine water | PNEC Sediment | 0.097 µg/kg sediment dw |
| | PNEC Soil | 0.129 µg/kg soil dw |

| | | |
|---|---|---|
| | PNEC STP | 0.71 mg/L |
| Intermittent use/release | PNEC Aqua | 1.34 µg/L |

## 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

| Property | Values | Remark |
|---|---|---|
| **Physical state** | Liquid | |
| **Colour** | white opaque | |
| **Appearance** | | No data available |
| **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 |
| **Softening point** | | No data available |
| **Boiling point** | 145 °C | Values related to styrene |
| **Flash point** | 31 °C | Values related to styrene |
| **Flammability** | | No data available |
| **Flammability Limit 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** | 1.45 - 1.5 g/cm3 | 20°C |
| **Specific Gravity** | | No data available |
| **Bulk density** | | No data available |
| **Water solubility** | Insoluble in water | |
| **Solubility in other solvents** | Soluble in most organic solvents | |

| | | |
|---|---|---|
| **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** | 255 - 517 mm2/s | 23ºC (Brookfield RVT) |
| **Viscosity, dynamic** | 370 - 750 mPa.s | 23ºC (Brookfield RVT) |

### 9.2. Other information

**Information with regards to physical hazard classes**

| Property | Values | Remark |
|---|---|---|
| **Explosives** | | No data available |
| **Flammable gases** | | No data available |
| **Aerosols** | | No data available |
| **Oxidising gases** | | No data available |
| **Gases under pressure** | | No data available |
| **Flammable liquids** | | No data available |
| **Flammable solids** | | No data available |
| **Pyrophoric liquids** | | No data available |
| **Pyrophoric solids** | | No data available |
| **Self-heating substances and mixtures** | | No data available |
| **Substances and mixtures which, in contact with water, emit flammable gases** | | No data available |
| **Oxidising liquids** | | No data available |
| **Oxidising solids** | | No data available |
| **Oxidising Properties** | | No data available |
| **Organic peroxides** | | No data available |
| **Corrosive to metals** | | No data available |
| **Desensitised explosives** | | No data available |

**Other safety characteristics**

| | |
|---|---|
| **Sensitivity to Mechanical Impact** | No data available |
| **SAPT (self-accelerating polymerisation temperature)** | No data available |
| **Formation of explosible dust/air mixtures** | No data available |
| **Acid/alkaline reserve** | No data available |
| **Miscible** | No data available |
| **Conductivity** | No data available |
| **Corrosiveness** | No data available |
| **Gas group** | No data available |
| **Redox potential** | No data available |
| **Photocatalytic properties** | No data available |

## SECTION 10: Stability and reactivity

### 10.1. 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, 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 information

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

**Acute toxicity**

**Inhalation** Harmful: danger of serious damage to health by prolonged exposure through inhalation
Irritating to respiratory system May produce an allergic reaction.

**Ingestion** Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

| Chemical Name | LD50 Oral | LD50 Dermal | LC50 Inhalation | Read-across (Analogy) |
|---|---|---|---|---|
| Styrene<br>100-42-5 | 5000 mg/kg (Rat) | > 2000 mg/kg bw (Rat) 24h<br>OECD 402 | 11.8 mg/L (Rat) 4h<br>CSR | |
| Aluminum hydroxide<br>21645-51-2 | > 2000 mg/kg bw (Rat)<br>OECD 423 | | > 2.3 mg/L air (Rat, aerosol) 4h<br>OECD 403, EPA 40 CFR 158 | |
| diantimony trioxide<br>1309-64-4 | | > 8300 mg/kg bw (168h) (Rabbit)<br>No guideline followed | > 5.2 mg/L air (Rat) 4h<br>OECD 403, EU Method B.2 | |
| Zinc borate<br>138265-88-0 | > 4100 mg/kg bw (Rat) | > 2000 mg/kg bw (Rat) | | |
| phthalic anhydride<br>85-44-9 | 1530 mg/kg bw (Rat) | > 3160 mg/kg bw (Rabbit) | > 2.14 mg/L (Rat) 4h<br>OECD 403 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | > 5000 mg/kg bw (Rat)<br>OECD 401 | > 5000 mg/kg (Rabbit) | > 0.14 mg/L air (Rat) 4h (analytical)<br>OECD 403 | |
| cobalt octoate<br>136-52-7 | 3129 mg/kg/bw (Rat)<br>OECD 425 | > 2000 mg/kg bw (Rat)<br>OECD 402 | | |
| Hydroquinone<br>123-31-9 | 367 mg/kg bw (Rat)<br>OECD 401 | > 2000 mg/kg bw (Rabbit)<br>OECD 402 | | |

**Skin corrosion/irritation**

| Chemical Name | Skin corrosion/irritation | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | Irritating to skin<br>in vivo assay<br>rabbit | |
| Aluminum hydroxide<br>21645-51-2 | No skin irritation<br>No skin corrosion<br>rabbit<br>OECD 404 | |
| diantimony trioxide<br>1309-64-4 | No skin irritation<br>in vivo assay<br>rabbit | |
| phthalic anhydride<br>85-44-9 | Irritating to skin<br>in vivo assay<br>rabbit<br>OECD 404 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | No skin irritation<br>rabbit<br>OECD 404 | |

| | | |
|---|---|---|
| cobalt octoate<br>136-52-7 | No skin corrosion<br>in vitro study<br>OECD 431<br>EU Method B. 40 | |
| Hydroquinone<br>123-31-9 | No skin irritation | |

**Serious Eye Damage/Eye Irritation**

| Chemical Name | Serious Eye Damage/Eye Irritation | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | Irritating to eyes<br>in vivo assay<br>rabbit | |
| Aluminum hydroxide<br>21645-51-2 | No eye irritation<br>in vivo assay<br>rabbit<br>OECD 405 | |
| diantimony trioxide<br>1309-64-4 | No eye irritation<br>in vivo assay<br>rabbit<br>OECD 405<br>EU Method B.5 | |
| phthalic anhydride<br>85-44-9 | Irritating to eyes<br>in vivo assay<br>rabbit<br>Draize Test | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | No eye irritation<br>rabbit<br>OECD 405 | |
| cobalt octoate<br>136-52-7 | Moderate eye irritation<br>OECD 437<br>EU Method B.47<br>Irritating to eyes<br>rabbit<br>OECD 405 | |
| Hydroquinone<br>123-31-9 | Risk of serious damage to eyes<br>Severe eye irritation | |

**Respiratory or skin sensitisation** May cause sensitisation by skin contact

| Chemical Name | Respiratory or skin sensitisation | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | Does not cause skin sensitization<br>Does not cause respiratory sensitization<br>CSR | |
| Aluminum hydroxide<br>21645-51-2 | Does not cause skin sensitization<br>Does not cause respiratory sensitization<br>in vivo assay<br>guinea pig<br>OECD 406<br>EPA OPPTS 870.2600 | |
| diantimony trioxide<br>1309-64-4 | Does not cause skin sensitization<br>in vivo assay<br>guinea pig<br>OECD 406 | |
| phthalic anhydride<br>85-44-9 | May cause sensitisation by inhalation and skin contact<br>in vivo assay<br>guinea pig<br>OECD 406 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | Does not cause skin sensitization<br>Does not cause respiratory sensitization | |
| cobalt octoate<br>136-52-7 | May cause sensitisation by skin contact<br>in vivo assay<br>mouse<br>OECD 429 | |
| Hydroquinone<br>123-31-9 | May cause sensitisation by skin contact<br>mouse<br>OECD 429<br>guinea pig<br>OECD 406 | |

**Mutagenic Effects**

**in vitro study**

| Chemical Name | Ames test | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | Ambiguous<br>In vitro gene mutation study in bacteria<br>(S. typhimurium G46, TA1530, TA 1535, TA100, TA98, TA1538, TA 1537)<br>OECD 471 | |
| diantimony trioxide<br>1309-64-4 | negative<br>In vitro gene mutation study in bacteria<br>(S. typhimurium TA 1535, TA 1537, TA 98 and TA 100)<br>(Escherichia coli WP2 uvrA)<br>OECD 471 | |
| phthalic anhydride<br>85-44-9 | negative<br>In vitro gene mutation study in bacteria<br>(S. typhimurium TA 1535, TA 1537, TA 98, TA100 and TA 102)<br>(Escherichia coli WP2 uvrA)<br>OECD 471 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | negative<br>In vitro gene mutation study in bacteria<br>OECD 471 | |
| cobalt octoate<br>136-52-7 | negative<br>In vitro gene mutation study in bacteria<br>(S. typhimurium TA 1535, TA 1537, TA 98, TA100 and TA 102)<br>OECD 471 | Cas N°: 68956-82-1, 14024-48-7 |
| Hydroquinone<br>123-31-9 | negative<br>In vitro gene mutation study in bacteria<br>OECD 471 | |

| Chemical Name | In vitro Mammalian Cell Gene Mutation Test | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | Ambiguous<br>In vitro gene mutation study in mammalian cells<br>hamster<br>OECD 476 | |
| Aluminum hydroxide<br>21645-51-2 | negative<br>In vitro gene mutation study in mammalian cells<br>mouse<br>OECD 476 | |
| diantimony trioxide<br>1309-64-4 | negative<br>In vitro gene mutation study in mammalian cells<br>mouse<br>OECD 476 | |
| phthalic anhydride<br>85-44-9 | negative<br>In vitro gene mutation study in mammalian cells<br>hamster<br>OECD 476 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | negative<br>In vitro gene mutation study in mammalian cells<br>OECD 476 | |
| cobalt octoate<br>136-52-7 | negative<br>In vitro gene mutation study in mammalian cells<br>mouse<br>OECD 476 | Cas N°: 7440-48-4, 1308-06-1, 10124-43-3, 12016-80-7 |
| Hydroquinone<br>123-31-9 | positive<br>Chromosome aberration test in vitro<br>OECD 483 | |
| **Chemical Name** | **In vitro Mammalian Chromosome Aberration Test** | **Read-across (Analogy)** |
| Styrene<br>100-42-5 | positive<br>Chromosome aberration test in vitro<br>OECD 473<br>OECD 479 | |
| diantimony trioxide<br>1309-64-4 | positive<br>Chromosome aberration test in vitro<br>OECD 473 | |

| | | |
|---|---|---|
| phthalic anhydride<br>85-44-9 | Ambiguous<br>Chromosome aberration test in vitro<br>hamster<br>OECD 473 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | negative<br>Chromosome aberration test in vitro<br>OECD 473 | |
| Hydroquinone<br>123-31-9 | positive<br>In vitro gene mutation study in mammalian cells<br>mouse<br>OECD 476 | |

**in vivo assay**

| Chemical Name | Unscheduled DNA Synthesis (UDS) | Read-across (Analogy) |
|---|---|---|
| Styrene<br>100-42-5 | negative<br>mouse<br>OECD 486<br>OECD 474 | |
| Aluminum hydroxide<br>21645-51-2 | negative<br>rat<br>OECD 474 | |
| diantimony trioxide<br>1309-64-4 | negative<br>mouse<br>OECD 474 | |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | negative<br>rat | |
| cobalt octoate<br>136-52-7 | negative<br>rat<br>OECD 474<br>OECD 475 | Cas N°: 68956-82-1, 14024-48-7, 10026-24-1 |

| Chemical Name | European Union |
|---|---|
| Hydroquinone<br>123-31-9 | Muta. 2 |

**Carcinogenicity** Limited evidence of a carcinogenic effect

**Carcinogenicity**

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

| Routes of Exposure | Method | Species | Dose | Evaluation |
|---|---|---|---|---|
| Inhalation | OECD 453 | rat | NOAEC systemic (carcinogenicity) >= 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) >= 2000 mg/kg bw /day | positive |
| Oral | No information available | mouse | LOAEL (carcinogenicity) = 150 mg/kg bw /day | positive |

**Aluminum hydroxide (21645-51-2)**

| Routes of Exposure | Method | Species | Dose | Evaluation |
|---|---|---|---|---|
| Inhalation | OECD TG 413 | rat | LOAEC (toxicity powder) = 50 mg/m³ air<br>NOAEC (toxicity dust) = 50 mg/m³ air | negative |

**diantimony trioxide (1309-64-4)**

| Routes of Exposure | Method | Species | Dose | Evaluation |
|---|---|---|---|---|
| Inhalation | similar to OECD 451 | rat | NOAEC (carcinogenicity) 52 weeks > 4.5 mg/m³ air | Limited evidence of a carcinogenic effect |

**phthalic anhydride (85-44-9)**

| Routes of Exposure | Method | Species | Dose | Evaluation |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Oral | No information available | mouse | NOAEL (carcinogenicity, male) = 3570 mg/kg bw/day (72w)<br>NOAEL (carcinogenicity, female) = 1785 mg/kg bw/day (72w) | negative |
| Oral | No information available | rat | NOAEL (carcinogenicity) = 1000 mg/kg bw/day (105w) | negative |

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

| **Hydroquinone (123-31-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | OECD 453 | mouse | LOAEL = 100 mg/kg bw/day<br>NOEL = 50 mg/kg bw/day | negative |

**Reproductive toxicity**

| **Reproductive toxicity** | | | | |
|---|---|---|---|---|
| **Styrene (100-42-5)** | | | | |
| Routes of Exposure | 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<br>LOAEC (P, F1) = 2.13 mg/L air<br>NOAEC (F2) = 0.21 mg/L air<br>LOAEC (F2) = 0.64 mg/L air (70d) | negative |

| **Aluminum hydroxide (21645-51-2)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | OECD 422 | rat | NOAEL (reproductive toxicity) = 1000 mg/kg bw/day<br>Read across with Cas N° : 1327-41-9 | negative |

| **diantimony trioxide (1309-64-4)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | | rat | NOAEL testicular toxicity (male) > 1200 mg/kg bw/day | negative |

| **phthalic anhydride (85-44-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | No information available | mouse | NOAEL (reproductive, male) = 3570 mg/kg bw/day (72w)<br>NOAEL (reproductive, female) = 1785 mg/kg bw/day (72w) | negative |
| Oral | No information available | rat | NOAEL (reproductive, female) = 1000 mg/kg bw/day (105w) | negative |

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

| **cobalt octoate (136-52-7)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | 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 |

| **Hydroquinone (123-31-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | EPA OTS 798.4700 | rat | NOAEL (parental toxicity) = 15 mg/kg bw/day LOAEL (reproductive effects) = 150 mg/kg bw/day | negative |

**Developmental Toxicity** Suspected of damaging the unborn child.

| **Developmental Toxicity** | | | | |
|---|---|---|---|---|
| **Styrene (100-42-5)** | | | | |
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Inhalation | No information available | rat | NOAEC/LOAEC (maternal toxicity + developemental 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 |

| **Aluminum hydroxide (21645-51-2)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | OECD 414 | rat | NOAEL (embryotixicity/teratogenicity) = 266 mg/kg bw/day | negative |

| **diantimony trioxide (1309-64-4)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Inhalation | OECD 414 | rat | LOAEC (maternal toxicity) 20d = 2.6 mg/m³ air NOAEC (developmental toxicity) 20d = 6.3 mg/m³ air | negative |

| **phthalic anhydride (85-44-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Evaluation |
| Oral | Read-across (Analogy) phthalic acid Cas N° : 88-99-3 | rat | NOAEL (maternal toxicity) = 1000 mg/kg bw/day NOAEL (teratogenicity) = 1700 mg/kg bw/day | positive |

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

| **Hydroquinone (123-31-9)** |
|---|

| Routes of Exposure | Method | Species | Dose | Evaluation |
|---|---|---|---|---|
| Oral | OECD 414 | rat | NOEL (maternal toxicity and developmental toxicity) = 100 mg/kg bw/day | negative |
| Oral | EPA OTS 798.4900 | rabbit | NOEL (maternal toxicity) = 25 mg/kg bw/day<br>NOEL (developmental toxicity) = 75 mg/kg bw/day | negative |

**Specific target organ toxicity - single exposure** May cause irritation of respiratory tract

| **STOT - single exposure** | | | | |
|---|---|---|---|---|
| **Hydroquinone (123-31-9)** | | | | |
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | No information available | mouse | NOAEL (90d) = 50 mg/kg bw/day | |

**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)** | | | | |
| Routes of Exposure | Method | Species | Dose | Remarks |
| Inhalation | OECD 412 | rat mouse | NOAEC male (28d) = 3.47 mg/L air<br>NOAEC (ototoxicity) 28d = 2.13 mg/L air<br>NOAEC (28d) = 0.181 mg/L air<br>NOAEC (28d) = 0.688 mg/L air | |
| Inhalation | No information available | rat | NOAEC (nasal tract) = 0.85 mg/L air<br>NOAEC (overall) = 2.13 mg/L air<br>NOAEC (ototoxicity) = 0.85 mg/L air<br>LOAEC (ototoxicity) = 3.41 mg/L air<br>NOAEC (overall) = 2.13 mg/L air | |
| Oral | No information available | rat | NOAEL (toxicity) = 1000 mg/kg bw/day<br>LOAEL (toxicity) = 2000 mg/kg bw/day | |
| Oral | No information available | mouse | NOAEL (toxicity) = 150 mg/kg bw /day<br>LOAEL (toxicity) = 300 mg/kg bw /day | |
| Inhalation | OECD 453 | rat | LOAEC local (toxicity) = 0.21 mg/L air | |

| **Aluminum hydroxide (21645-51-2)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | OECD 407 | rat | NOAEL (28d) = 300 mg/kg bw | |
| Inhalation | Read-across (Analogy) with Aluminium powder and Aluminium oxide dust OECD 413 | hamster | NOAEC (dust) = 70 mg/m³ air | |
| Inhalation | OECD 412 | rat | NOAEC (aerosol) = 3 mg/m³ air<br>LOAEC (aerosol) = 28 mg/m³ air | |

| **diantimony trioxide (1309-64-4)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | No information available | rat | NOAEL (male) 90d = 1686 mg/kg bw/day<br>NOAEL (female) 90d = 1879 mg/kg bw/day | |
| Inhalation | similar to OECD 452 | rat | NOAEC >= 0.51 mg/m³ air<br>LOAEC (impaired lung clearance) >= 4.5 mg/m³ air<br>1 year | |

| **phthalic anhydride (85-44-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | No information available | rat | NOAEL = 1250 mg/kg bw/day<br>LOAEL = 2500 mg/kg bw/day<br>7 weeks | |
| Oral | No information available | rat | NOAEL (105 weeks) = 500 mg/kg bw/day | |
| Oral | No information available | mouse | LOAEL (male) = 2340 mg/kg bw/day<br>LOAEL (female) = 1717 mg/kg bw/day<br>72 weeks | |

| **Silica, amorphous, fumed, crystalline-free (112945-52-5)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | OECD 408 | rat | NOEL (highest dose) 4000 <= 4500 mg/kg bw/day<br>90d | |
| Inhalation | OECD 413 | rat | NOEC = 1.3 mg/m³ air<br>NOEC < 1.3 mg/m³ air<br>90d | |
| Dermal | No information available | rabbit | NOAEL >= 10000 mg/kg bw/day | |

| **cobalt octoate (136-52-7)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | Read-across (Analogy) cobalt dichloride hexahydrate OECD 408 | rat | NOAEL (90d) = 3 mg/kg bw/day | |

| **Hydroquinone (123-31-9)** | | | | |
|---|---|---|---|---|
| Routes of Exposure | Method | Species | Dose | Remarks |
| Oral | OECD 453 | rat | NOAEL (chronic toxicity) = 25 mg/kg bw/day | |
| Dermal | OECD 411 | rat | NOAEL (male) = 73.9 mg/kg bw/day<br>NOAEL (female) = 109.6 mg/kg bw/day | |

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

### 11.2 Information on other hazards

**Endocrine disrupting properties** No information available
**Other information** None

## SECTION 12: Ecological information

### 12.1. Toxicity

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<br>100-42-5 | EC50 (72h) = 4.9 mg/L (Pseudokirchnerella subcapitata)<br>EPA OTS 797.1050 | EC50 (48h) = 4.7 mg/L (Daphnia magna)<br>NOEC = 1.9 mg/L (Daphnia magna)<br>OECD 202 | LC50 (96h) = 4.02 - 10 mg/L (Pimephales promelas)<br>OECD 203 | EC (30min) = 500 mg/L (Activated sludge of a predominantly domestic sewage)<br>OECD 209 |
| Aluminum hydroxide<br>21645-51-2 | EC50 (72h) > 100 mg/L (Pseudokirchnerella subcapitata)<br>OECD 201 | EC50 (46h) > 100 mg/L (Daphnia magna)<br>OECD 202 | LC50 (96h) > 100 mg/L (Salmo trutta)<br>OECD 203 | |
| diantimony trioxide<br>1309-64-4 | EC50 (72h) = 206 mg/L (Pseudokirchnerella subcapitata<br>)<br>NOEC (72h) = 100 mg/L (Pseudokirchnerella subcapitata<br>)<br>OECD Guideline 201 | LC50 (96h) = 1.77 mg/L (Chlorohydra viridissimus)<br>NOEC (96h) = 1.11 mg/L (Chlorohydra viridissimus)<br>LOEC (96h) = 1.5 mg/L Chlorohydra viridissimus<br>Read across with N°Cas : 10025-91-9<br>No guideline followed | LC50 (96h) = 6.9 mg/L (Pargus major)<br>Read across with N°Cas : 12208-13-8 | EC50 (4h) = 27 mg/L (activated sludge)<br>NOEC (4h) = 2.55 mg/L (activated sludge)<br>Read across with Cas N° : 10025-91-9<br>ISO DIS 9509 |
| Zinc borate<br>138265-88-0 | | EC50 (48h) = 76 mg/L (Daphnia magna Straus) | LC50 (96h) = 2.4 mg/L (Rainbow trout) | |
| phthalic anhydride<br>85-44-9 | EC50 (72h) = 68 mg/L, NOEC (72h) = 32 mg/L (Pseudokirchnerella subcapitata)<br>OECD 201 | EC50 (48h) = 71 mg/L (Daphnia magna)<br>OECD 202 | LC50 (96h) > 99 mg/L (Oryzias latipes)<br>OECD 203 | EC50 (3h) > 1000 mg/L (Activated sludge), ISO 8192<br>EC50 (16h) = 13 mg/L (Pseusomonas putida), ISO 10712 |
| Silica, amorphous, fumed, crystalline-free<br>112945-52-5 | | EL50 (24h) >= 1000 mg/L (Daphnia magna)<br>OECD 202 | LC50 (96h) > 10000 mg/L (Brachydanio rerio)<br>OECD 203 | |
| cobalt octoate<br>136-52-7 | EC50 (72h) = 144 µg Codiss./L (Pseudokirchneriella subcapitata)<br>NOEC (72h) = 32.2 µg./L (Pseudokirchneriella subcapitata)<br>LOEC (72h) = 52.7 µg Codiss./L (Pseudokirchneriella subcapitata)<br>OECD 201 | | LC50 (96h) = 1.512 mg/L (Oncorhynchus mykiss)<br>NOEC (96h) = 0.939 mg/L (Oncorhynchus mykiss)<br>LOEC (96h) = 1.577 mg/L (Oncorhynchus mykiss)<br>ASTM guideline (1996) | EC10 (30 min) = 3.73 mg/L (Activated sludge)<br>EC50 (30 min) = 120 mg/L (Activated sludge)<br>Read across with Cas N°: 7646-79-9<br>OECD 209 |
| Hydroquinone<br>123-31-9 | ErC50 (72h) = 0.330 mg/L ; NOEC (72h) (growth rate) = 0.019 mg/L (Pseudokirchnerella subcapitata )<br>OECD 201 | EC50 (48h) = 0.134 mg/L (Daphnia magna) OECD 202<br>NOEC (21d) = 0.0057 mg/L (Daphnia magna)<br>OECD 211 | LC50 (96h) = 0.638 mg/L (Oncorhynchus mykiss)<br>OECD 203 | |

**Chronic aquatic toxicity - Component Information**

| Chemical Name | Toxicity to algae | Toxicity to daphnia and other aquatic invertebrates. | Toxicity to fish | Toxicity to microorganisms |
|---|---|---|---|---|
| Styrene<br>100-42-5 | | NOEC (21d) = 1.01 mg/L (Daphnia magna)<br>LOEC (21d) = 2.06 mg/L (Daphnia magna)<br>EC50 (21d) = 1.88 mg/L (Daphnia magna)<br>OECD 203 | | |
| Aluminum hydroxide<br>21645-51-2 | NOEC (72h) >= 0.004 mg/L (Pseudokirchnerella subcapitata)<br>OECD 201 | | NOEC (96h) > 48.2 mg/L (Pimephales promelas) | |

| | | | | |
|---|---|---|---|---|
| diantimony trioxide<br>1309-64-4 | | LC50 (21d) = 4.77 mg/L (Daphnia magna)<br>EC50 (21d) = 3.82 mg/L (Daphnia magna)<br>NOEC (21d) = 3.13 mg/L (Daphnia magna)<br>LOEC (21d) = 5.86 mg/L (Daphnia magna)<br>Read across with N°Cas : 10025-91-9<br>OECD Guideline 211 | NOEC (28d) = 1.13 - 2.31 mg/L (Pimephales promelas)<br>Read across with N°Cas : 10025-91-9<br>No guideline followed | |
| phthalic anhydride<br>85-44-9 | | NOEC (reproduction) 21d = 16 mg/L, EC50 (reproduction) 21d = 42 mg/L (Daphnia magna)<br>OECD 211 | LC50 (7d) = 560 mg/L (Danio rerio), OECD 210<br>LOEC (total embryotoxicity) 60d = 32 mg/L, NOEC (mortality, lengh, weight, embryotoxicity) 60d = 10 mg/L, OECD 210 | |
| cobalt octoate<br>136-52-7 | EC50 (7d) = 90.1 µg./L (Lemna minor)<br>NOEC (7d) = 3.0 µg/L (Lemna minor)<br>LOEC (7d) = 8.8 µg/L (Lemna minor)<br>OECD 221 | NOECR (21d) = 60.8 µg./L (Daphnia magna)<br>LC50 (21d) = 121.3 mg/L (Daphnia magna)<br>LOECR (21d) = 93.3 µg Codiss./L (Daphnia magna)<br>OECD 211 | | |

**Effects on terrestrial organisms - Component Information**

| **Acute toxicity** | | | | |
|---|---|---|---|---|
| **phthalic anhydride (85-44-9)** | | | | |
| Acute toxicity | Test Method | Species | Values | Remarks |
| plants | | Lactuca sativa | EC50 (germination) = 731 mg/L | |

| **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<br>LOEC (burrowing time and mean percent weight change) = 65 mg/kg soil dw<br>LOEC (survival) = 180 mg/kg soil dw<br>NOEC (mean percent weight change) = 34 mg/kg soil dw | |

## 12.2. Persistence and degradability

| Chemical Name | Biodegradation | Evaluation |
|---|---|---|
| Styrene<br>100-42-5 | 87% (20d) similar to OECD 301D | Readily biodegradable |
| phthalic anhydride<br>85-44-9 | 68 % (10d), 74 % (30d)<br>OECD 301 D | Readily biodegradable |
| cobalt octoate<br>136-52-7 | 60% (> 10d), OECD 301 B | Readily biodegradable |
| Hydroquinone<br>123-31-9 | 70 % (14d) OECD 301C | Readily biodegradable |

## 12.3. Bioaccumulative potential

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

| **diantimony trioxide (1309-64-4)** | | |
|---|---|---|
| Method | Species | Bioconcentration factor (BCF) |
| No data available | | 5.6 L/Kg |

| **phthalic anhydride (85-44-9)** | | |
|---|---|---|
| Method | Species | Bioconcentration factor (BCF) |
| Calculation method | | 3.16 - 3.4 |

| **Hydroquinone (123-31-9)** | | |
|---|---|---|
| Method | Species | Bioconcentration factor (BCF) |
| No data available | Leuciscus idus melanotus | 40 (3d) |

| **Chemical Name** | **log Pow** |
|---|---|
| Styrene<br>100-42-5 | 3 |
| diantimony trioxide<br>1309-64-4 | 1.63 |
| Zinc borate<br>138265-88-0 | 0.19 |
| phthalic anhydride<br>85-44-9 | 1.6 |
| Hydroquinone<br>123-31-9 | 0.59 |

## 12.4. Mobility in soil

| **Chemical Name** | **LogKoc** | **Koc** |
|---|---|---|
| Styrene<br>100-42-5 | 2.55 | 352 |
| phthalic anhydride<br>85-44-9 | - | 31 |
| Hydroquinone<br>123-31-9 | 0.97 - 1.7 | - |

## 12.5. Results of PBT and vPvB assessment

| **Chemical Name** | **PBT** | **vPvB** |
|---|---|---|
| Styrene<br>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). |
| Aluminum hydroxide<br>21645-51-2 | 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). |
| diantimony trioxide<br>1309-64-4 | 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). |
| Zinc borate<br>138265-88-0 | This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). | |
| phthalic anhydride<br>85-44-9 | 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<br>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). |
| Hydroquinone<br>123-31-9 | 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). |

## 12.6 Endocrine disrupting properties

**Endocrine disrupting properties** No information available

## 12.7 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.<br>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 or ID 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 | |
| **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 available |

### 14.7. Maritime transport in bulk according to IMO instruments

**Transport in bulk according to Annex II of MARPOL 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. 2020/878**
**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

**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
H302 - Harmful if swallowed
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
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H351 - Suspected of causing cancer
H360Fd - May damage fertility. Suspected of damaging 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
H410 - Very toxic to aquatic life with long lasting effects
H412 - Harmful to aquatic life with long lasting effects
EUH208 - May produce an allergic reaction

| | |
|---|---|
| **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 |
| **Former date** | 15-Dec-2022 |
| **Revision date** | 29-Aug-2023 |
| **Revision Note** | SDS sections updated : 1 |

**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, Coulour 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, Coulour 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, Coulour 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** | PROC 1 - Chemical production in closed process<br><br>PROC 3 - Use in closed batch process (synthesis or formulation)<br><br>PROC 4 - Chemical production where opportunity for exposure arises<br><br>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)<br><br>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities<br><br>PROC 8b - Transfer of substance or mixture (charging and discharging) at dedicated facilities<br><br>PROC 9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)<br><br>PROC 15 - Use of laboratory reagents in small scale laboratories |
| **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)* |



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| | |
|---|---|
| Release times per year | 300 days/year *(justification: Continous release)* |
| 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 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002)* |
| Fraction released to industrial soil (Femis.ind) | 0 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002))* |
| Fraction released to waste water (Femis.water) | 0.00063 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction released to air (Femis.air) | 0.102 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction used at main source | 60 % *(justification: Value adopted to account for Worst-case European manufacturing site )* |
| Fraction of emission directed to water by local STP (Fstp.water) | 0.081 - *(justification: Efficiency STP 91.9%)* |

## 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.<br>Closed processes |
| **Qualitative Risk Assessment** | |
| General | Use in semi-automated and predominantly enclosed filling lines.<br>Provide a good standard of general ventilation.<br>Natural ventilation is from windows and doors etc.<br>Controlled ventilation means air is supplied or removed by a powered fan.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection. |
| **Product characteristics** | |
| Physical state | liquid |
| Concentration in substance | 100 % |



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| | |
|---|---|
| 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.<br>Receipt and storage of raw materials in bulk or as packed goods, indoor and outdoor;<br>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;<br>Use bulk or semi-bulk handling systems.<br>Drain down and flush system prior to equipment break-in or maintenance.<br>Provide extract ventilation to points where emissions occur.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>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 |



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| | |
|---|---|
| **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;<br>Drain down and flush system prior to equipment break-in or maintenance.<br>Apply vessel entry procedures including use of forced supplied air.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>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%) |



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| | |
|---|---|
| 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.<br>Cleaning and maintenance of blending vessel, roadtankers etc. |
| **Qualitative Risk Assessment** | |
| General | Use in semi-automated and predominantly enclosed filling lines.<br>Drain or remove substance from equipment prior to break-in or maintenance.<br>Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).<br>Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |



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| | |
|---|---|
| **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.<br>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).<br>Provide extract ventilation to points where emissions occur.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |



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| | |
|---|---|
| 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):<br>Avoid dip sampling.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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) |



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| | |
|---|---|
| Scenario subtitle | Drum/batch transfers;<br>Pouring from small containers;<br>Transfer from/pouring from containers;<br>Mixing operations (open systems).<br>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).<br>Keep lids of containers closed during blending.<br>Ensure good work practices are implemented.<br>Provide basic employe training to prevent/minimize exposures.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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.<br>Cleaning and maintenance of pipes, pumps, filters, etc. |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Drain down system prior to equipment break-in or maintenance.<br>Drain or remove substance from equipment prior to break-in or maintenance.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Wear suitable coveralls to prevent exposure to the skin.<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |
| 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |

## 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 | Disposal of wastes.<br>Handling of non cured waste;<br>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** | |



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| | |
|---|---|
| General | Provide a good standard of general ventilation.<br>Controlled ventilation means air is supplied or removed by a powered fan.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Dispose of empty containers and wastes safely.<br>Dispose of waste in accordance with environmental legislation.<br>Use suitable chemically resistant gloves, tested to EN374.<br>In case of potential exposure wear a suitable respiratory protection with adeguate effectiveness.<br>Use suitable eye protection. |
| **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 | Bulk transfers.<br>All activities related to transport finished product to customer.<br>Dispensing final UP/VE resin (linear UP/VE polymer + styrene + additives) into roadtanker |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Fill containers/cans at dedicated fill points supplied with local extract ventilation.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable chemically resistant gloves, tested to EN374.<br>Use suitable eye protection.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |
| 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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 | Bulk transfers.<br>All activities related to transport finished product to customer.<br>Dispensing final UP/VE resin (linear UP/VE polymer + styrene + additives) / into storage tank, IBC, drum or pail. |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Fill containers/cans at dedicated fill points supplied with local extract ventilation.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable chemically resistant gloves, tested to EN374.<br>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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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.<br>All laboratory activities.<br>Quality control work of samples from reactor and blending vessel.<br>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.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374. |
| **Product characteristics** | |



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| | |
|---|---|
| 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |



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# 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** | PROC 3 - Use in closed batch process (synthesis or formulation)<br><br>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)<br><br>PROC 7 - Industrial spraying<br><br>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities<br><br>PROC 10 - Roller application or brushing<br><br>PROC 13 - Treatment of articles by dipping and pouring<br><br>PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation<br><br>PROC 15 - Use of laboratory reagents in small scale laboratories |
| **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: Continous release)* |
| Local freshwater dilution factor | 10 |



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| | |
|---|---|
| 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 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002))* |
| Fraction released to industrial soil (Femis.ind) | 0 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002))* |
| Fraction released to waste water (Femis.water) | 0.00063 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction released to air (Femis.air) | 0.102 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction used at main source | 60 % *(justification: Value adopted to account for Worst-case European manufacturing site )* |
| Fraction of emission directed to water by local STP (Fstp.water) | 0.081 - *(justification: Efficiency STP 91.9%)* |
| **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;<br>Automated process with (semi) closed systems;<br>Use in contained batch processes.<br>Resin injection and transfer processes, such as vacuüm infusion, RTM, impregnation of sewer relining sleeves |
| **Qualitative Risk Assessment** | |
| General | Put lids on containers immediately after use.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>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) |



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| | |
|---|---|
| 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.<br>Product delivery/storage - delivery of bulk and packaged products - outdoor / indoor |
| **Qualitative Risk Assessment** | |
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>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 |



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| | |
|---|---|
| **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;<br>Pouring from small containers;<br>Transfer from/pouring from containers;<br>Mixing operations (open systems).<br>Loading of mixing equipment; Preparation of material for application; (liquid products) - batch, indoor |
| **Qualitative Risk Assessment** | |
| General | Put lids on containers immediately after use.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |



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| 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;<br>Mixing operations (open systems).<br>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<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |

| 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) |



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| | |
|---|---|
| Scenario subtitle | General exposures (closed systems).<br>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.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **Contributing Scenario (7) controlling industrial worker exposure for PROC 7** | |
| **Name of contributing scenario** | 7 - Industrial spraying |
| Scenario subtitle | Spraying;<br>Spraying (automatic/robotic)<br>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 |



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|---|---|
| **Qualitative Risk Assessment** | |
| General | Ensure the ventilation system is regularly maintained and tested<br>Dispose of empty containers and wastes safely<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Wear suitable coveralls to prevent exposure to the skin<br>Use suitable eye protection.<br>Wear suitable face shield<br>Wear chemically resistant gloves tested to EN374, in combination with intensive management supervision control.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |
| 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 % *(justification: Carry out in a vented booth or extracted enclosure)* |
| **Contributing Scenario (8) controlling industrial worker exposure for PROC 7** | |
| **Name of contributing scenario** | 7 - Industrial spraying |
| Scenario subtitle | Spraying;<br>Spraying (manually)<br>All open mould applications where resins is applied by manual spraying in an open work environement. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding |
| **Qualitative Risk Assessment** | |



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|---|---|
| General | Carefully pour from containers<br>Use long handled tools where possible<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Wear suitable face shield.<br>Wear suitable coveralls to prevent exposure to the skin<br>Wear chemically resistant gloves tested to EN374 in combination with intensive management supervision control.<br>Wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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;<br>Maintenance of small items.<br>Equipment cleaning and maintenance |
| **Qualitative Risk Assessment** | |



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|---|---|
| General | Drain or remove substance from equipment prior to break-in or maintenance.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |
| 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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 | Disposal of wastes.<br>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** | |



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|---|---|
| General | Put lids on containers immediately after use.<br>Contain and dispose of waste according to local regulations<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **Contributing Scenario (11) controlling industrial worker exposure for PROC 10** | |
| **Name of contributing scenario** | 10 - Roller application or brushing |
| Scenario subtitle | Rolling, Brushing;<br>Roller, spreader, flow application<br>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** | |



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|---|---|
| General | Use long handled brushes and rollers where possible<br>Ensure the ventilation system is regularly maintained and tested<br>Dispose of empty containers and wastes safely<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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;<br>Rolling, Brushing;<br>Roller, spreader, flow application<br>Application of repair putties; Application of bonding pastes / adhesives. |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>Wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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;<br>Continuous process.<br>Continuous processes with open impregnation steps, such as pultrusion with open impregnation baths and (semi-) continuous production of flat laminates |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **Contributing Scenario (14) controlling industrial worker exposure for PROC 14** | |
| **Name of contributing scenario** | 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation |
| Scenario subtitle | Material transfers;<br>Production or preparation or articles by tabletting, compression, extrusion or pelletisation;<br>Treatment by heating;<br>Batch processes at elevated temperatures.<br>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** | |



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| | |
|---|---|
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>In case of potential exposure:<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |
| **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.<br>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<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374. |
| **Product characteristics** | |
| Physical state | liquid |



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| | |
|---|---|
| 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 % *(justification: Use local exhaust ventilation with adequate effectiveness)* |



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# 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** | PROC 3 - Use in closed batch process (synthesis or formulation)<br><br>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises<br><br>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)<br><br>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities<br><br>PROC 10 - Roller application or brushing<br><br>PROC 11 - Non industrial spraying |
| **Contributing Scenario (1) controlling environmental exposure for ERC 6C** | |
| **Operational conditions** *(referred to styrene)* | |
| Daily amount used at site | 48300 kg/day (*referred to styrene)* |
| Release times per year | 300 days/year *(justification: Continous 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 | 0.000012 % |



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| | |
|---|---|
| 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 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002))* |
| Fraction released to industrial soil (Femis.ind) | 0 % *(justification: No direct release to soil (EU Risk Assessment Report on Styrene,European Communities, 2002))* |
| Fraction released to waste water (Femis.water) | 0.000012 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction released to air (Femis.air) | 0.102 % *(justification: EU Risk Assessment Report, 2002)* |
| Fraction used at main source | 60 % *(justification: Value adopted to account for worst-case European manufacturing site )* |
| Fraction of emission directed to water by local STP (Fstp.water) | 0.081 - *(justification: Efficiency STP 91.9%)* |
| **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.<br>Application of chemical anchoring |
| **Qualitative Risk Assessment** | |
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>In case of potential exposure:<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 $cm^2$ |



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| | |
|---|---|
| **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.<br>Sewer relining operation |
| **Qualitative Risk Assessment** | |
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |



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| 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;<br>Pouring from small containers.<br>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.<br>Put lids on containers immediately after use.<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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 |
|---|



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| | |
|---|---|
| **Name of contributing scenario** | 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities |
| Scenario subtitle | Equipment maintenance;<br>Maintenance of small items.<br>Equipment cleaning and maintenance |
| **Qualitative Risk Assessment** | |
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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.<br>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** | |



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| | |
|---|---|
| General | Dispose of empty containers and wastes safely<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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;<br>Roller, spreader, flow application<br>All open mould applications where resins is applied by brushing, rolling and other low energy spreading operations;<br>Examples are handlamination, gelcoatbrushing, semi-continuous production of flat panels and laminates |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Use long handled brushes and rollers where possible<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>In case of potential exposure wear a suitable respiratory protection with adeguate 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;<br>Rolling, Brushing;<br>Roller, spreader, flow application<br>Application of repair putties; Application of bonding pastes / adhesives. |
| **Qualitative Risk Assessment** | |



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| | |
|---|---|
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>Wear a suitable respiratory protection with adeguate 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;<br>Rolling, Brushing;<br>Roller, spreader, flow application<br>Application of floorings, mastics, coatings, castings |
| **Qualitative Risk Assessment** | |
| General | Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Use suitable chemically resistant gloves, tested to EN374.<br>Wear suitable coveralls to prevent exposure to the skin.<br>Wear a suitable respiratory protection with adeguate effectiveness. |
| **Product characteristics** | |



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| | |
|---|---|
| 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;<br>Spraying (manually)<br>All open mould applications where resins is applied by manual spraying in an open work environement. 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<br>Ensure good work practices are implemented<br>Provide basic employe training to prevent/minimize exposures<br>Use suitable eye protection.<br>Wear suitable face shield<br>Wear suitable coveralls to prevent exposure to the skin.<br>Wear chemically resistant gloves, tested to EN374, in combination with intensive management supervision control.<br>Wear a suitable respiratory protection with adeguate effectiveness. |
| **Product characteristics** | |
| Physical state | liquid |



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| | |
|---|---|
| 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 |



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