



Information & Documents

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Fire Test reports are available on request.



**FLEXIBLE
ROOFING
SOLUTION**





Metroflex is the proven & permanent GRP roofing solution that will outperform all other flat roof coverings



Metroflex is issued with its own 20 year materials guarantee directly from the manufacturer, along with a workmanship guarantee from the installer that your roof will be free from any leakages for at least 20 years.



The Metroflex system has been tested and approved to the highest specification of fire resistance (BS476 pt3 FAA) to meet all building control requirements for flat roofing.



Tough and highly flexible, Metroflex can be applied to many existing roof coverings. Formulated to remain resistant to thermal expansion and foot traffic.

- Seamless - no weak joints or welds
- Fully bonded - Liquid applied to roof deck
- Super tough, highly flexible resin - reinforced with glassfibre
- 20 year materials guarantee
- Contains FIRELOK[®] for highest flat roof rating - BS476 Pt3 FAA

Metroflex Roofing system can be applied to any flat roof of any size and any configuration, and can be installed without expensive specialist tools. The completed monolithic (seamless) membrane is hard wearing, resisting UV, heat, weathering and foot traffic.

The Metroflex system has been tested and approved to the highest specification of fire resistance (BS476 pt3 FAA) to meet all building control requirements for flat roofing.

Our standard colour is RAL 7016 Anthracite Grey, and a slate granule can be added to create a natural non-slip finish if required.

All Metroflex products carry a materials guarantee, so you will be covered for anything nature can throw at your roof for 20 years.

OVERLAYING METROFLEX ON SUBSTRATES OTHER THAN OSB3 DECKING

ENSURE THE ROOF SURFACE IS DRY

It is critically important to ensure that the roof surface you intend to apply the Metroflex System to is completely dry before you start. Application on to wet substrates is likely to cause contamination to the materials and adhesion not to occur, causing a total failure of the system.

FULLY ASSESS THE SUITABILITY OF ANY SURFACES TO BE COATED

All roof surfaces that are being considered for over-laying should be fully assessed for damage and compatibility before starting. Any existing damage should be made good, and any questionable surfaces should have an adhesion test carried out. Thoroughly clean down all areas which are to be coated, removing all dirt and debris, surface water, mould, moss etc. Loose and embedded chippings should also be removed.

The decision to overlay an existing roof covering comes down to the installer, and it is their responsibility to carry out all necessary cleaning, repairs, and testing prior to overlaying.

OVERLAYING FELT

Any areas of damaged or loose felt on the roof surface MUST be repaired and re-bonded prior to overlaying with MetroFlex. Ensure the roof surface is clean and any loose material has been brushed away. MetroFlex Primer is recommended to be used prior to following the application process.

OVERLAYING ASPHALT

Ensure that any blow holes and structural cracks are made good and/or removed prior to overlaying. Allow for any repairs to fully cure, following the manufacturers guidelines. MetroFlex Primer is recommended to be used prior to following the application process.

OVERLAYING GRP

Heavily abrade the existing GRP covering using a 40 grit paper, giving a good rough surface. Clean the surface using Acetone to remove any contamination from the surface. MetroFlex Primer is not required before the application process.

OVERLAYING CONCRETE/RENDER/BRICKWORK

Remove any damaged or loose material and repair where necessary with a suitable repair mortar. Any smooth concrete or render surfaces should be lightly abraded to create a good clean, dry, and open surface. Repair any major cracks etc using repair mortar. Newly laid concrete should be left to cure for a minimum of 2 weeks. MetroFlex Primer is essential to be used prior to following the application process.

OVERLAYING SINGLE PLY

Check and repair any damage to the membrane as necessary. It is essential that an adhesion test is completed to ensure that a sufficient bond is achievable. Clean all single ply surfaces with Acetone. MetroFlex Primer is essential to be used prior to following the application process.

USING METROFLEX PRIMER

ADDITION OF CATALYST	RESIN WEIGHT	
	5kg	20kg
1%	50g	200g
2%	100g	400g
3%	150g	600g
4%	200g	800g
5%	250g	1000g
6%	300g	1200g

If primer is required, follow directions below:

- After the catalyst has been stirred in, the primer is poured on to the substrate in stripes and distributed with a short pile paint roller.
- Apply at a rate of between 0.3 to 0.5 kg/ m², depending on the density and porosity of the substrate. Continue applying primer until saturation occurs to obtain a continuous resin film. On porous substrates, a second primer coat may be required.
- Do not apply when surface temperature is above 40°C and/or rapidly rising. Special care must be observed if the area is exposed to direct sunlight.
- The Primer should be ready to overlay with MetroFlex Resin after approximately 45 minutes, when the Primer is slightly tacky to the touch but there is no transfer of material.

LAMINATING / TOPCOATING PROBLEMS

WET WEATHER

If it should rain while the resin is liquid, stop work and cover what you have done immediately. Water will contaminate the resin and prevent it from curing. If it rains at any point after the resin has started to change from a liquid to a solid, although not ideal, it should be OK. Any rain falling will settle on top and not mix so the resin should still complete its cure. However, it is very likely that gas (styrene) given off while the resin is curing will still react with the water. This will manifest itself as a white coating that appears on the surface of your fibreglass layer. If this happens at the fibreglass stage, dry the surface and wipe down with acetone as this should remove most of the white coating. Then check all areas have cured, sand down with heavy grit paper, clean and apply the final resin coat as normal.

WEATHER CONDITIONS

It is very important to check weather conditions and temperatures before starting GRP application. It is advisable to avoid working in the rain. A check on the average temperatures forecast is also important to ensure that the correct amount of catalyst is mixed into the resin.

CATALYST MIXING

If the resin is not mixed with the correct amount of catalyst, it can have several detrimental effects. Too little catalyst can lead to uncured resin which can mean that the resin will remain soft and will not provide a totally hard and waterproof surface. Too much catalyst can cause the resin to cure too fast which can lead to exotherm and damage to laminate.

WETTING OUT

It is vitally important to ensure that every part of the fibreglass mat is completely wetted out with resin. Dry patches can lead to problems. Laminate that has not had the resin completely infused into the fabric can have areas that will leak. The fibres of the dry area can force upwards through the final resin coat and water can then run down the fibre and cause a leak.

PINHOLE

Pinholes occur where there are gaps in the fibreglass mat. This can be due to incomplete wetting out of the fabric. They will appear in the final resin coat as tiny pinholes. They can be rectified by sanding the area and reapplying a new resin layer to seal the pinholes and prevent the leak.



METROFLEX
THE FLEXIBLE CHOICE



METROFLEX

A 5 step reference guide for installers

The Metroflex Roofing System is a wet laid flexible roofing system consisting of a GRP laminate which is finished around the perimeter with pre-formed GRP edge trims. Unlike conventional GRP systems, Metroflex, when used in conjunction with its revolutionary priming system, can overlay many different substrates such as felt, concrete, asphalt, GRP, liquid and single-ply for example. This completely removes the need to strip the existing roof covering if the condition is suitable.

If you are overlaying any substrate other than new OSB3 Decking, please refer to the Priming section of this installation guide.

CHOOSING THE RIGHT MATERIALS

Which Mat to Use?

Metroflex can be used with both 225g and 300g emulsion bound chopped strand mats. For best performance we recommend 300g.

WHAT TOOLS WILL YOU NEED?

Mixing Buckets

Measuring cup

Paint Brushes

Acetone

Medium pile rollers

Gloves

Extension Handle

Goggles

Mixing sticks

Overalls



GRP
ROOFING
SOLUTION

5 STEP GUIDE



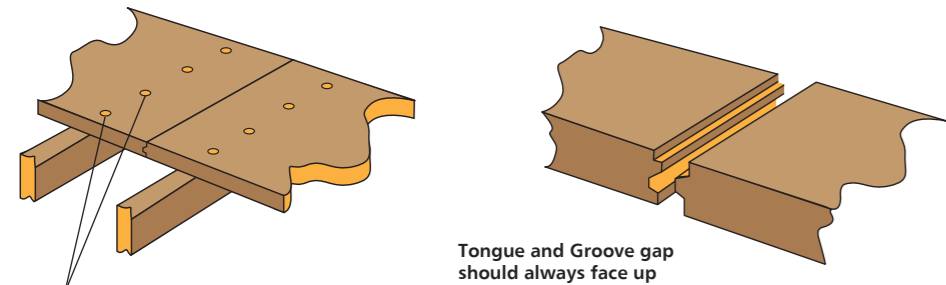
METROFLEX

APPLICATION/CONSTRUCTION

Step 1. Deck

For best results, lay a substrate of new 18mm OSB3 decking of 2400mm x 600mm, tongue and groove. Its surface is particularly good for maximum adhesion of resin, as the slotted joints increase roof strength and are much quicker and easier to fit than 2400mm x 1200mm cut edge boards. Do not use any chipboard based decking.

The first step to start your fibreglass roof is to lay the OSB boards onto the joists. The tongue and groove boards should be laid at 90° to the roof joists. It is important to have the boards laid with the gap side of the tongue and groove facing upwards. This will allow the resin to flow between the boards and glue them together. The OSB boards should be staggered to allow a strong deck to be built. When all the boards are aligned in rows the joints become weak and can move over time. Boards are attached to joists using a nail gun or screws at 200mm centres, and fixings must penetrate a minimum of 40mm into the joist. For a warm roof, the top deck should be attached with sufficiently long screws to penetrate the lower deck. Ensure extra fixings are used here to prevent deck movement.



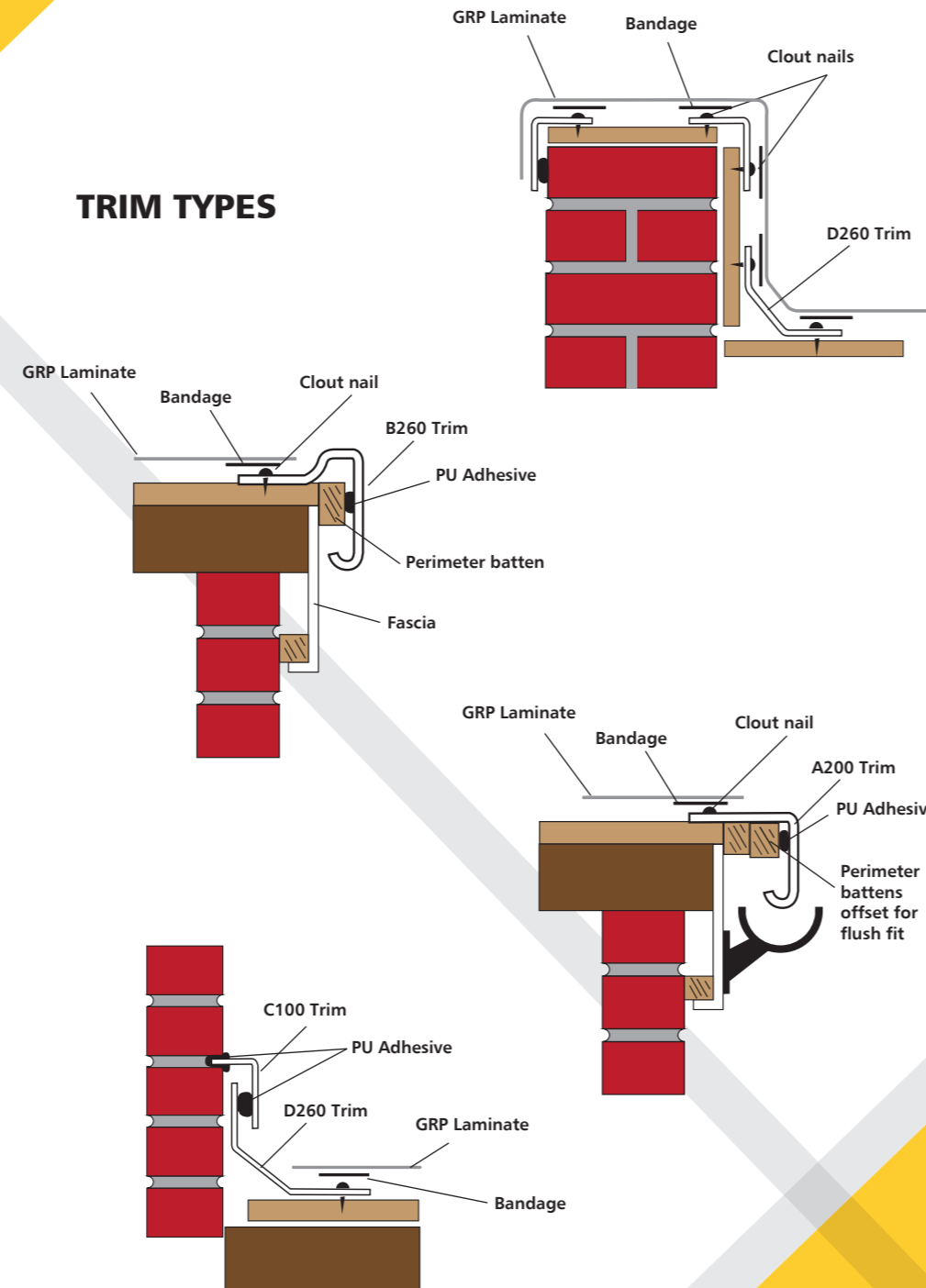
Boards should be fixed at 200mm centres

Tongue and Groove gap should always face up

Step 2. Trims

Trims need to be fixed to the deck using galvanized clout nails or staples. A flexible PU adhesive is used to secure the trims to a supporting batten at the front. Where trims need to be joined, this should be done by using a bead of PU Adhesive, and the joint is finished using a strip of matting or fibreglass tape and resin.

TRIM TYPES



Step 3. Bandaging

Before laying the fibreglass mat, cover the trim edges that meet the deck with a strip of fibreglass tape or fibreglass mat bandage. This will help to seal the edge of the trim to the deck. To do this, apply a thin layer of resin over the deck and trim edge with a roller, and then apply the tape. Wet out the tape until the resin is well absorbed into the glass.

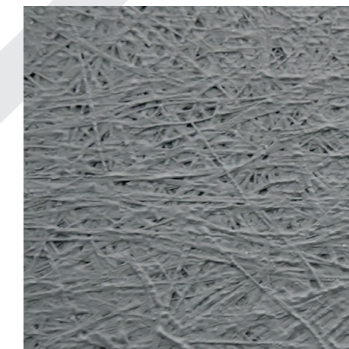
Step 4. Laminating - Prepare the matting

Ideally, you should orientate your matting parallel to the drip edge, with the first 'run' starting at that side, but this is for cosmetic reasons. Matting is random stranded so structurally it is not essential to worry about roll direction. Roll out the mat across the roof and cut to length (allowing for 50mm onto the edge of the trim). Matting will have one cut edge and one 'feathered' edge, the feathered edge should always overlap cut edges by 50mm. Repeat until you have enough prepared rolls to start work.

Application

Stir the resin in its original container to ensure that any additives in the resin are thoroughly mixed in. Decant enough resin into a separate container to 'wet out' the fibreglass mat. The amount of resin you need to mix will be dependent on weather conditions - you will have less working time the hotter the conditions. 300g matting will require a minimum of 0.75kg resin per metre run.

Mix the resin thoroughly with the correct amount of catalyst. To start the process of laying up, firstly cover the area of board being fibreglassed with a coat of resin using a medium pile roller. Lay the fibreglass on the wet board and 'wet out' using the resin-soaked roller, being careful to avoid leaving any dry patches in the fibreglass mat. Now use the resin-soaked roller to roll the area to remove any air bubbles and work the resin into the fibreglass mat until the fibrous texture is reduced as much as possible.



Inspect the laminate, ensuring there are no dry patches (where matting appears fibrous) or pin holes. If any are found, add more resin to the affected area and reconsolidate.

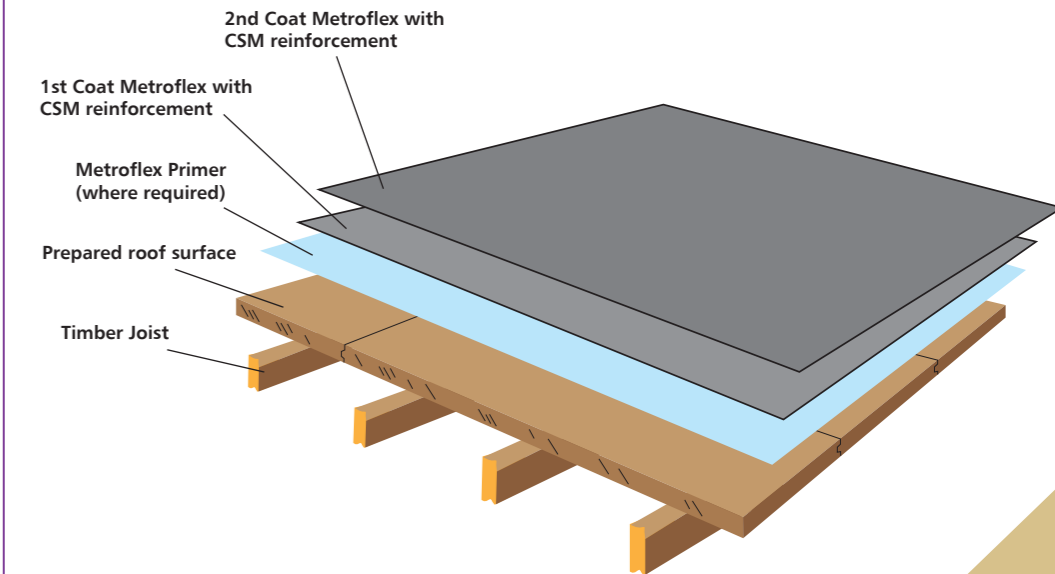
Step 5. Topcoating

Once the roof area has cured and is touch dry, it can now be topcoated to create the final waterproof layer. Inspect the fibreglass layer for signs of any defects, such as loose strand spikes which should be sanded and then cleaned of dust. If the fibreglass layer is older than 48 hrs, the whole roof needs to be sanded with 40 grit paper and wiped down with acetone to ensure a suitable bond between topcoat and fibreglass.

Thoroughly stir the required amount of resin to ensure that any additives in the resin are thoroughly mixed in. Decant a manageable amount of the resin into a separate container, and mix thoroughly with the correct amount of catalyst.

Coverage of topcoat is approximately 250g per m² (minimum).

Once catalysed, the resin can be applied to the roof using a fluffy roller. Ensure coverage is even, and ensure the resin is completely covering the fibreglass with nothing exposed. Trims should also be coated in resin. Cover the entire roof with the resin and allow it to cure. If you are using MetroFlex Non-Slip Additive, it can now be sprinkled on the wet topcoat. Always ensure that the area is kept dry whilst curing, as water can affect the appearance and strength of the uncured laminate.





20 YEAR MATERIALS GUARANTEE

This is a materials guarantee between CFSNET LTD and The Installer.
This does not cover The Installer's client or holder of The Installer's Workmanship Guarantee.

CFSNET LTD guarantees that The Metroflex GRP Roofing System has been designed to be used, in conjunction with suitable fibre reinforcement, to produce composite laminates. Provided that these materials are used as recommended on their appropriate technical data sheets, the material will give a structural and weather resistant laminate with a life expectancy of not less than 20 years under normal conditions.

The limit of liability to CFSNET LTD under this guarantee is to provide the Installer with the Metroflex GRP Roofing System Materials necessary to repair and replace any sections of the roof that are no longer waterproof, but only where this is a direct result of defective Metroflex GRP Roofing System Materials supplied by CFSNET LTD.

This materials guarantee is between CFSNET LTD and The Installer and is issued subject to compliance with the terms of the Metroflex Materials Guarantee.

For and on behalf of
CFSNET LTD

A handwritten signature in blue ink, appearing to read 'A J McGovan', is written over a horizontal line.

Mr Andrew J McGovan
Company Director



METROFLEX MATERIALS GUARANTEE

This materials guarantee between is between CFSNET LTD ("Us" or "We") and the installer of the Metroflex Roofing System ("You" or "Your"). If You successfully make a claim under this Materials Guarantee, We will cover the costs of supplying certain replacement Metroflex Roofing System parts to You in the event that they are no longer waterproof within the first 20 years following their compliant installation, and their use under normal conditions.

1 MATERIALS REQUIREMENTS

1.1 This guarantee only covers Metroflex materials installed following the specific instructions as detailed in the installation guide used for roofs where the complete Metroflex Roofing System has been installed, which consists of the:

- 1.1.1 Metroflex Roofing Primer (Where necessary);
- 1.1.2 Metroflex Roofing Resin;
- 1.1.3 CFSNET LTD Roofing Edge Trims;
- 1.1.4 CFSNET LTD Chopped Strand Mat; and
- 1.1.5 CFSNET LTD Powder Catalyst.

1.2 These materials must be stored and installed as outlined in any applicable guidance, including but not limited to the then current Metroflex installation manual.

2 INSTALLER REQUIREMENTS

2.1 You must keep a record of the following information:

- 2.1.1 the original invoices for all Metroflex materials used within the installation;
- 2.1.2 a record of all the Metroflex and CFSNET LTD product batch numbers;
- 2.1.3 full details of all the works carried out by You, including start and completion dates, as well as the size of the installation;
- 2.1.4 a description of the substrate used;
- 2.1.5 catalyst mixing percentages;
- 2.1.6 weather conditions and approximate temperatures at the time(s) of installation; and
- 2.1.7 the Workmanship Guarantee, completed in accordance with section 2.2 below.

2.2 On completion of the Metroflex Roofing System installation, You must issue a SEPARATE guarantee to Your customer which covers Your workmanship for a period of 20 years from the date of installation (the "Workmanship Guarantee"). The Workmanship Guarantee must set out Your relevant credentials as well as Your contact details, and be signed by the customer. As part of the Workmanship Guarantee, You must make good any defects or faults in the installation of the Metroflex Roofing System which leads to a failure in the system's waterproofing, at Your own cost.

3 EXCLUSIONS

3.1 We expressly reserve the right to reject any claim under this Materials Guarantee where We believe You have failed to comply with any of the requirements set out in this Materials Guarantee.

3.2 This Materials Guarantee covers defects in the Metroflex Roofing System materials only. It does not cover: neglect; general wear and tear; cosmetic changes; damage (unless caused by Us); any attempted tampering or repairs; acts of God; or any other inappropriate use of the Metroflex Roofing System.

3.3 This Materials Guarantee does not cover any costs or expenses incurred through inspections or surveys which may highlight any defects in the Metroflex Roofing System.

3.4 This Materials Guarantee will not apply in the case where any part of the then current Metroflex Roofing System

installation does not conform with the Metroflex Installation Manual.

3.5 This Materials Guarantee is personal to You and will not be available to any of Your successors and/or purported assigns. In addition this Materials Guarantee shall terminate automatically, with immediate effect, if You undergo any insolvency event or otherwise cease to trade for any reason.

4 MAKING A CLAIM UNDER THIS GUARANTEE

4.1 You should contact Us by email at sales@cfsnet.co.uk, informing us of the fault and the relevant batch number of the affected materials forming part of the Metroflex Roofing System. We may then require further information from you such as proof that the Metroflex materials forming part of the installation were used within their applicable shelf-life, and evidence (such as photographs or a video clip) that the affected Metroflex materials are no longer waterproof.

4.2 We may then relay this information to our manufacturer, to determine whether there has been a general issue with any particular batch of the Metroflex materials. We may require You to return the affected materials to Us for analysis, which we will arrange for, at Our cost.

4.3 If it is proven that there is a manufacturing defect affecting the materials forming the subject of your claim, provided that Your claim meets all other conditions set out in this Materials Guarantee, We will replace the affected Metroflex Roofing System materials or provide the equivalent materials currently available in our absolute discretion. You agree that such a replacement is your sole and exclusive remedy for manufacturing defects in the Metroflex Roofing System.

4.4 If it is proven that there is no manufacturer's defect in the Metroflex Roofing System forming the subject of your claim, We may still replace the affected materials, or provide the equivalent materials currently available at our absolute discretion.

5 GENERAL

5.1 Unless otherwise agreed, We exclude all other guarantees, warranties or conditions, express or implied, relating to satisfactory quality and/or fitness for a particular purpose in connection with the Metroflex Roofing System. Nothing in this guarantee shall exclude or limit our liability for death or personal injury resulting from our negligence or for fraud.

5.2 Subject to paragraph 5.2, Our total liability in connection with the Metroflex Roofing System, howsoever arising, shall be limited to the purchase price of the particular product(s) to which any claims relate.

5.3 This Materials Guarantee constitutes the entire agreement between You and Us and supersedes and extinguishes all previous agreements, promises, assurances, warranties, representations and understandings between You and Us relating to its subject matter.

5.4 You agree that you shall have no remedies in respect of any statement, representation, assurance or warranty that is not set out in this Materials Guarantee.

5.5 This guarantee and any disputes or claims arising out of or in connection with it are governed by and construed in accordance with English law. The courts of England and Wales shall have exclusive jurisdiction to settle any disputes or claims arising out of or in connection with this Materials Guarantee.



Technical data sheet

METROFLEX FLEXIBLE RESIN

Generic Family: 9241

First Emission: 12/10/2022 Version: 0,12/10/2022

Product type

Pre-accelerated, unsaturated polyester Fire Retardant material in styrene.

Appearance

Various Colours

Description

POLYCOR 9241 TM FR ULV is a speciality Fire Retardant Roofing material for speciality flat roof systems.

Please contact your CFSNET Ltd representative for full details.

These are available in a limited range of colours but colour matching requests are possible.

This product range is ready to use and exhibit good application characteristics.

This range contains only styrene monomer as reactive diluent.

Materials are not designed to be used for swimming pool recoating / relining applications.

Materials contain wax and cure tack free to provide an attractive cosmetic film on the back of composite pieces. They are not suitable to be used as in mould applied gel coats.

Materials contain wax and cure tack free to provide an attractive cosmetic film on the back of composite pieces. They are not suitable to be used as in mould applied gel coats.

Key Features & Benefits

Filled
Fire retardant properties
Good flexibility and elasticity
Low styrene content
Low viscosity
Paraffinated
Pigmented
Preaccelerated

Application

Do mix the material prior to use, preferably using a mechanical mixer with sufficient power for the appropriate container at low rpm. Mixing for 10 minutes every day is usually sufficient. Do NOT use air bubbling directly to mix.

Ensure material is used at minimum liquid temperature of 18°C including the mould used and workshop environment conditions.

The final Fire resistance properties could change following the final structure of the piece and its use's condition. It will be necessary to verify the final properties on a prototype before industrial production.

This material is ready to use - It contains wax to allow tack free curing.

Use only the recommended MEKP Peroxide dosage between 1.2 to 3.0% w/w

Shelf life and storage

Please ensure you rotate stock and use within shelf life.

Please note the Shelf life for this product relates to unopened containers; Only open container prior to use.

Read carefully the Safety Data Sheet before use.

Store in the shade, out of direct sunlight. Keep storage temperature below 25°C. Shelf-life will be reduced at higher temperature.

CHARACTERISTICS (1)

Properties

Shelf life at 23°C in the dark

Density - 25°C

Solid content

Rheology

Brookfield viscosity at 25°C, sp 4 rpm 5

Brookfield viscosity: 5 rpm / 50 rpm at 25°C

Reactivity

Gel Time at 25°C + 1,8% MEKP50

Curing time at 25°C + 1,8% MEKP50

Peak exotherm at 25°C + 1,8% MEKP50

Film Properties

Tack free Film cure : 500-700u at 25°C

Test Method

MT-C G 001 O

MT-CG 001C

MT-CG 025V

MT-CG 025V

MT-C G004 R

MT-C G004 R

MT-C G004 R

MT-C G 901 R

Unit

months

g/cm³

%

mPa.s

minutes

minutes

°C

min.

Typical values

4

1.4-1.5

78-83

5000-7000

2.0-3.5

13-15

22-30

80-100

<90

1) Thoroughly test the material in your applications before full-scale use. Gellimes may vary due to the reactive nature of these materials and due to different brands of curing additives. Always test on small scale before formulating large quantities.

PROPERTIES OF THE MATERIAL'S BASE RESIN IN CURED STATE (2)

Curing cycle

24h at 23°C + 24h at 60°C

HDT

ISO 75-2A (2013)

°C

N/A

Tensile strength

ISO 527 (2012)

MPa

20

Elongation at break

ISO 527 (2012)

%

50

2) Properties are typical values, based on material tested in our laboratories, but varies from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

The information contained in this document (which is to be intended only for explanatory purposes) is correct and accurate and is based on our technical and scientific knowledge and on literature at the date of publication. Such information relates only to use of the products in the pure state and for the purposes stated herein. Nothing in the information contained in this document shall be deemed to be a warranty or a representation (explicit or implicit) by the manufacturer, and/or taken or construed as infringing of any existing patents. The manufacturer shall not be under any liability or responsibility for any of the information provided under this document or for any errors, omissions or misstatements, even with regard to results to be obtained through the use of the aforesaid information.

CFSNET Ltd
United Downs Industrial Park
St Day, Redruth
Cornwall TR16 5HY
Tel: 01209 821028
www.cfsnet.co.uk
sales@cfsnet.co.uk



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

SDS n° : FP18684

METROFLEX ROOFING RESIN

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Former date -

Revision date 22-Jun-2022

Version: 1

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

1.1. Product identifier

Product name METROFLEX FLEXIBLE ROOFING RESIN
Chemical Name Gel Coat polyester for composites.
Trade name METROFLEX FLEXIBLE ROOFING RESIN
Pure substance/mixture Mixture

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

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

1.3. Details of the supplier of the safety data sheet

Supplier CFSNET Ltd
United Downs Industrial Park
St Day, Redruth
Cornwall TR16 5HY
Tel: 01209 821028
sales@cfsnet.co.uk
www.cfsnet.co.uk

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 sales@cfsnet.co.uk
Internet Address www.cfsnet.co.uk

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)
Specific Target Organ Toxicity (Single Exposure)	Category 3 - (H335)
Specific target organ toxicity - repeated exposure	Category 1 - (H372)
Chronic Aquatic Toxicity	Category 3 - (H412)
Flammable liquids	Category 3 - (H226)

2.2. Label elements

Contains cobalt octoate, Maleic anhydride, Styrene

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

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

Physical hazards

H226 - Flammable liquid and vapour

Precautionary statements P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P243 - Take action to prevent static discharges

P260 - Do not breathe vapour

P273 - Avoid release to the environment

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

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
Aluminum hydroxide	244-492-7	01-2119529246-39	21645-51-2	> 20	-
Styrene	202-851-5	01-2119457861-32	100-42-5	25 - 30	Flam. Liq. 3 (H226) Repr. 2 (H361d) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Asp. Tox. 1 (H304) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Chronic 3 (H412)
Titanium dioxide	236-675-5	01-2119489379-17	13463-67-7	< 2	-
Amorphous Silica	231-545-4	01-2119379499-16	7631-86-9	< 1	-
(2-methoxymethylethoxy)propanol	252-104-2	01-2119450011-60	34590-94-8	< 1	-
cobalt octoate	205-250-6	01-2119524678-29	136-52-7	0.1 - < 0.3	Skin Sens. 1A (H317) Eye Irrit. 2 (H319) Repr. 1B (H360Fd) Aquatic Acute 1 (H400) Aquatic Chronic 3 (H412)
Xylene	215-535-7	01-2119488216-32	1330-20-7	< 0.25	Flam. Liq. 3 (H226) Asp. Tox. 1 (H304) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335) STOT RE 2 (H373)
N,N-dimethyl-p-toluidine	202-805-4	01-2119937766-23	99-97-8	< 0.25	Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) STOT RE 2 (H373) Aquatic Chronic 3 (H412)
Maleic anhydride	203-571-6	01-2119472428-31	108-31-6	0.001 - < 0.01	Acute Tox. 4 (H302) Skin Corr. 1B (H314) Skin Sens. 1A (H317) Eye Dam. 1 (H318) Resp. Sens. 1 (H334) STOT RE 1 (H372) STOT RE 2 (H373) (EUH071)

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance Do not breathe dust/fume/gas/mist/vapours/spray

Eye Contact

Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing.
If symptoms persist, call a physician

Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes If skin irritation persists, call a physician
Inhalation	Move to fresh air If not breathing, give artificial respiration Consult a physician
Ingestion	Do NOT induce vomiting Rinse mouth. Consult a physician

Protection of first-aiders Use personal protective equipment See section 8 for more information

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

Eye Contact Irritating to eyes

Skin contact Irritating to skin
May cause sensitisation by skin contact

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

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

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

Notes to physician No information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Dry chemical, Foam, Carbon dioxide (CO₂), (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 Vapours may form explosive mixtures with air. Most vapours are heavier than air. They from will spread along ground and collect in low or confined areas (sewers, basements, tanks) **itself, combustion products,** Heating or fire can release toxic gas : Carbon monoxide **resulting gases**

5.3. Advice for firefighters

Special protective equipment for Wear self-contained breathing apparatus and protective suit. **fire-fighters**

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

Packaging material

metallic GRP Tanks (Reinforced Glass Polyester)

Unsuitable materials for containers

copper, Copper alloys, Bronze, Zinc

7.3. Specific end use(s)

Specific use(s) No information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure limits

Chemical Name	European Union	ACGIH OEL (Ceiling)	The United Kingdom	Ireland
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Aluminum hydroxide 21645-51-2			STEL 30 mg/m ³ STEL 12 mg/m ³ TWA 10 mg/m ³ TWA 4 mg/m ³	We are not aware of any national exposure limit.
Styrene 100-42-5	-	ACGIH (2020): TLV-TWA: 10 ppm TLV-STEL/C: 20 ppm Notes: OTO, A3, BEI Critical effects: CNS and hearing impairment, URT irr, peripheral neuropathy visual disorders	STEL 250 ppm STEL 1080 mg/m ³ TWA 100 ppm TWA 430 mg/m ³	TWA 20 ppm TWA 85 mg/m ³ STEL 40 ppm STEL 170 mg/m ³
Titanium dioxide 13463-67-7		TWA 10 mg/m ³	STEL 30 mg/m ³ STEL 12 mg/m ³ TWA 10 mg/m ³ TWA 4 mg/m ³	TWA 10 mg/m ³ TWA 4 mg/m ³
Amorphous Silica 7631-86-9			STEL 18 mg/m ³ STEL 7.2 mg/m ³ TWA 6 mg/m ³ TWA 2.4 mg/m ³	TWA 6 mg/m ³ TWA 2.4 mg/m ³
(2-methoxymethylethoxy)propanol 34590-94-8	TWA 50 ppm TWA 308 mg/m ³ S*	TWA 100 ppm	STEL 150 ppm STEL 924 mg/m ³ TWA 50 ppm TWA 308 mg/m ³ Skin	TWA 50 ppm TWA 308 mg/m ³ Skin
cobalt octoate 136-52-7		0.02 mg/m ³	STEL 0.3 mg/m ³ TWA 0.1 mg/m ³ Sen+	TWA 0.1 mg/m ³ Sensitizer
Xylene 1330-20-7	TWA 50 ppm TWA 221 mg/m ³ STEL 100 ppm STEL 442 mg/m ³ S*	TWA 100 ppm	STEL 100 ppm STEL 441 mg/m ³ TWA 50 ppm TWA 220 mg/m ³ Skin	TWA 50 ppm TWA 221 mg/m ³ STEL 100 ppm STEL 442 mg/m ³ Skin
Maleic anhydride 108-31-6		TWA 0.1 ppm	STEL 3 mg/m ³ TWA 1 mg/m ³ Sen+	TWA 0.25 ppm TWA 1 mg/m ³ Sensitizer

Special hazards arising from the substance or mixture

Biological standards

Chemical Name	European Union	The United Kingdom	Ireland
Xylene 1330-20-7	-	Methyl hippuric acid in urine: 650 mmol/mol creatinine, end of shift	We are not aware of any national exposure limit.

Derived No Effect Level (DNEL)

Derived No Effect Level (DNEL)				
Aluminium hydroxide (21645-51-2)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Local effect			3.59 mg/m ³	
General Population - Long Term - Systemic effect	2.37 mg/kg bw/day			
Styrene (100-42-5)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect		406 mg/Kg bw/day	85 mg/m ³	
Workers - Acute Short Term Local effect			306 mg/m ³	
Workers - Acute Short term Systemic effect			289 mg/m ³	
General Population - Acute Short Term - Local effect			182.7 mg/m ³	
General Population - Acute Short Term - Systemic effect			174.2 mg/m ³	

General Population - Long Term - Systemic effect	2.1 mg/Kg bw/day	343 mg/Kg bw/day	10.2 mg/m ³	
Titanium dioxide (13463-67-7)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Local effect			10 mg/m ³	
General Population - Long Term - Systemic effect	700 mg/kg bw/day			
Amorphous Silica (7631-86-9)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect			4 mg/m ³	
(2-methoxymethylethoxy)propanol (34590-94-8)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect		283 mg/kg bw/day	308 mg/m ³	
General Population - Long Term - Systemic effect	36 mg/kg bw/day	121 mg/kg bw/day	37.2 mg/m ³	
cobalt octoate (136-52-7)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term - Local effect			235.1 µg/m ³	
General Population - Long Term - Systemic effect	175 µg/kg bw/day			
General Population - Long Term - Local effect			37 µg/m ³	
ylene (1330-20-7)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect		180 mg/kg bw/day	77 mg/m ³	
Workers - Acute Short term Systemic effect			289 mg/m ³	
Workers - Acute Short Term Local effect			289 mg/m ³	
General Population - Long Term - Systemic effect	1.6 mg/kg bw/day	108 mg/kg bw/day	14.8 mg/m ³	
General Population - Acute Short Term - Systemic effect			174 mg/m ³	
General Population - Acute Short Term - Local effect			174 mg/m ³	
N,N-dimethyl-p-toluidine (99-9-8)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect		1.186252632 mg/kg bw/day	1.352328 mg/m ³	
General Population - Long Term - Systemic effect	2.372505263 mg/kg bw/day	0.292521739 mg/kg bw/day	0.3364 mg/m ³	

Maleic anhydride (108-31-6)				
Type	DNEL oral	DNEL dermal	DNEL inhalation	Remark
Workers - Long Term Systemic effect			0.081 mg/m ³	
Workers - Acute Short term Systemic effect			0.2 mg/m ³	
Workers - Long Term - Local effect			0.081 mg/m ³	
Workers - Acute Short Term Local effect			0.2 mg/m ³	

Predicted No Effect Concentration (PNEC)

PNEC Component		
Aluminium hydroxide (21645-51-2)		
Exposure	Type	PNEC
	PNEC STP	20 mg/L
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
Titanium dioxide (13463-67-7)		
Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.184 mg/L
Marine water	PNEC Aqua	0.0184 mg/L
Intermittent use/release	PNEC Aqua	0.193 mg/L
	PNEC STP	100 mg/L
Fresh water	PNEC Sediment	1000 mg/kg sediment dw
Marine water	PNEC Sediment	100 mg/kg sediment dw
	PNEC Soil	100 mg/kg soil dw
Amorphous Silica (7631-86-9)		
Exposure	Type	PNEC
Secondary Poisoning	PNEC Oral	60000 mg/kg
(2-methoxymethylethoxy)propanol (34590-94-3)		
Exposure	Type	PNEC
Marine water	PNEC Aqua	1.9 mg/L
Fresh water	PNEC Aqua	19 mg/L

Intermittent use/release	PNEC Aqua	190 mg/L
	PNEC STP	4168 mg/L
Fresh water	PNEC Sediment	70.2 mg/kg sediment dw
Marine water	PNEC Sediment	7.02 mg/kg sediment dw
	PNEC Soil	2.74 mg/kg soil dw
cobalt octoate (136-52-7)		
Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.62 µg/L
Marine water	PNEC Aqua	2.36 µg/L
STP microorganisms	PNEC STP	0.37 mg/L
Fresh water	PNEC Sediment	53.8 mg/kg sediment dw
Marine water	PNEC Sediment	69.8 mg/kg sediment dw
Terrestrial Compartment	PNEC Soil	10.9 mg/kg soil dw
Xylene (1330-20-7)		
Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.327 mg/L
Marine water	PNEC Aqua	0.327 mg/L
Intermittent use/release	PNEC Aqua	0.327 mg/L
	PNEC STP	6.58 mg/L
Fresh water	PNEC Sediment	12.46 mg/kg sediment dw
Marine water	PNEC Sediment	12.46 mg/kg sediment dw
	PNEC Soil	2.31 mg/kg soil dw
N, N-dimethyl-p-toluidine (99-97-8)		
Exposure	Type	PNEC
Marine water	PNEC Aqua	0.015259 mg/L
Fresh water	PNEC Aqua	0.15259 mg/L
	PNEC STP	4.2863 mg/L
Fresh water	PNEC Sediment	45.37770249 mg/kg sediment dw
Marine water	PNEC Sediment	45.37770249 mg/kg sediment dw
	PNEC Soil	18.67677186 mg/kg soil dw
Maleic anhydride (108-31-6)		
Exposure	Type	PNEC
Fresh water	PNEC Aqua	0.038 mg/L
Intermittent use/release	PNEC Aqua	0.379 mg/L
Marine water	PNEC Aqua	0.004 mg/L
	PNEC STP	44.6 mg/L
Fresh water	PNEC Sediment	0.296 mg/kg sediment dw
Marine water	PNEC Sediment	0.03 mg/kg sediment dw

	PNEC Soil	0.037 mg/kg soil dw
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8.2. Exposure controls

Occupational exposure controls

Engineering measures

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

Personal protective equipment

General Information

Use personal protective equipment.

Respiratory protection

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

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

Eye protection

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

Skin and body protection

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

Hand protection

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

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

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

Environmental exposure controls

Environmental exposure controls

Do not allow material to contaminate ground water system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<u>Property</u>	<u>Values</u>	<u>Remark</u>
Physical state Colour	Liquid Variable (This Data Sheet includes all the colours)	
Appearance		
Particle size		No data available
Odour		No data available
Odour Threshold	Styrene	
pH	0.15 ppm	Values related to styrene
pH (as aqueous solution)		No data available
Melting point/range		No data available
Freezing Point	- 30 °C	Values related to styrene
Softening point		No data available
Boiling point		No data available
Flash point	145 °C	Values related to styrene
Flammability Limit in Air	31 °C	Values related to styrene
Upper	6,1 - 6,8%	Values related to styrene
Lower	0,9 -1,1%	Values related to styrene
Vapour pressure	1 kPa	25°C Values related to styrene
Vapour density	3.6	Values related to styrene
Density	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	2667 - 8000 mm ² /s	25°C
Viscosity, dynamic	4000 - 12000 mPa.s	25°C

9.2. Other information**Information with regards to physical hazard classes**

Property	Values	Remark
Explosive	No data available s	
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 Substances and mixtures which, in contact with water, emit flammable	No data available mixtures	No data available gases
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	No
data available polymerisation temperature)			
Formation of explosible dust/air	No data available	mixtures	
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 Incomplete combustion and thermolysis produces potentially toxic gases such as carbon products 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

Ingestion

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

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	> 2000 mg/kg bw (Rat) OECD 423		> 2.3 mg/L air (Rat, aerosol) 4h OECD 403, EPA 40 CFR 158	
Styrene 100-42-5	5000 mg/kg (Rat)	> 2000 mg/kg bw (Rat) 24h OECD 402	11.8 mg/L (Rat) 4h CSR	
Titanium dioxide 13463-67-7	> 5000 mg/kg bw (Rat) OECD 425, EPA OPPTS 870.1100		> 6,82 mg/L air (Rat) 4h No guideline followed	
Amorphous Silica 7631-86-9	> 5000 mg/kg bw (Rat) OECD 401	> 5000 mg/kg (Rabbit)	> 0.14 mg/L air (Rat) 4h (analytical) OECD 403	
(2-methoxymethylethoxy)propanol 34590-94-8	> 5000 mg/kg bw (Rat) Similar to OECD 401	9510 mg/kg bw(Rabbit) 24h Similar to OECD 402	LC0 (7h) > 275 ppm (1667 mg/m ³) (Rat) Similar to OECD 403	
cobalt octoate 136-52-7	3129 mg/kg/bw (Rat) OECD 425	> 2000 mg/kg bw (Rat) OECD 402		
Xylene 1330-20-7	3523 mg/kg bw (Rat, male) > 4000 mg/kg bw (Rat, female) Similar to EU Method B.1	> 4200 mg/kg bw (Rabbit) No Guideline followed	29091 mg/m ³ (Rat) 4h Similar to EU Method B.2	
N,N-dimethyl-p-toluidine 99-97-8	139 mg/kg bw (Mouse)	> 2000 mg/kg bw (Rabbit) OECD 402	1400 mg/m ³ (Rat) 4h	
Maleic anhydride 108-31-6	1090 mg/kg bw (Rat) OECD 401	2620 mg/kg bw (Rabbit) No guideline followed		

Skin corrosion/irritation

Chemical Name	Skin corrosion/irritation	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	No skin irritation No skin corrosion rabbit OECD 404	
Styrene 100-42-5	Irritating to skin in vivo assay rabbit	
Titanium dioxide 13463-67-7	No skin irritation in vivo assay rabbit OECD 404 EPA OPPTS 870.2500	

Amorphous Silica 7631-86-9	No skin irritation rabbit OECD 404	
(2-methoxymethylethoxy)propanol 34590-94-8	No skin irritation in vivo assay rabbit similar to OECD 404	
cobalt octoate 136-52-7	No skin corrosion in vitro study OECD 431 EU Method B. 40	
Xylene 1330-20-7	Moderate skin irritation No skin corrosion in vivo assay rabbit similar to EU Method B.4	
N,N-dimethyl-p-toluidine 99-97-8	Mild skin irritation in vivo assay rabbit OECD 404	
Maleic anhydride 108-31-6	Causes severe skin burns and eye damage in vivo assay rabbit similar to OECD 404	

Serious Eye Damage/Eye Irritation

Chemical Name	Serious Eye Damage/Eye Irritation	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	No eye irritation in vivo assay rabbit OECD 405	
Styrene 100-42-5	Irritating to eyes in vivo assay rabbit	
Titanium dioxide 13463-67-7	No eye irritation in vivo assay rabbit OECD 405 EU Method B.5 EPA OPPTS 870.2400	
Amorphous Silica 7631-86-9	No eye irritation rabbit OECD 405	
(2-methoxymethylethoxy)propanol 34590-94-8	No eye irritation in vivo assay	
cobalt octoate 136-52-7	Moderate eye irritation OECD 437 EU Method B.47 Irritating to eyes rabbit OECD 405	
Xylene 1330-20-7	Moderate eye irritation in vivo assay rabbit	
N,N-dimethyl-p-toluidine 99-97-8	No eye irritation in vivo assay rabbit	

Maleic anhydride 108-31-6	Causes severe eye damage in vivo assay (rabbit) similar to OECD 405	
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Respiratory or skin sensitisation May cause sensitisation by skin contact

Chemical Name	Respiratory or skin sensitisation	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	Does not cause skin sensitization Does not cause respiratory sensitization in vivo assay guinea pig OECD 406 EPA OPPTS 870.2600	
Styrene 100-42-5	Does not cause skin sensitization Does not cause respiratory sensitization CSR	
Titanium dioxide 13463-67-7	Does not cause skin sensitization in vivo assay guinea pig OECD 406 EU Method B.6 EPA OPP 81-6 mouse similar to OECD 429	
Amorphous Silica 7631-86-9	Does not cause skin sensitization Does not cause respiratory sensitization	
(2-methoxymethylethoxy)propanol 34590-94-8	Does not cause skin sensitization in vivo assay	
cobalt octoate 136-52-7	May cause sensitisation by skin contact in vivo assay mouse OECD 429	
Xylene 1330-20-7	Does not cause skin sensitization in vivo assay mouse OECD 429	
N,N-dimethyl-p-toluidine 99-97-8	Does not cause skin sensitization in vivo assay rabbit	
Maleic anhydride 108-31-6	May cause sensitisation by skin contact in vivo assay mouse similar to OECD 429 May cause sensitisation by inhalation rat	

Mutagenic Effects in vitro study

Chemical Name	Ames test	Read-across (Analogy)
Styrene 100-42-5	Ambiguous In vitro gene mutation study in bacteria (S. typhimurium G46, TA1530, TA 1535, TA100, TA98, TA1538, TA 1537) OECD 471	
Titanium dioxide 13463-67-7	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98, TA100 and TA 102) OECD 471	

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Amorphous Silica 7631-86-9	negative In vitro gene mutation study in bacteria OECD 471	
(2-methoxymethylethoxy)propanol 34590-94-8	negative In vitro gene mutation study in bacteria (Escherichia coli WP2 uvrA) similar to OECD 471	
cobalt octoate 136-52-7	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98, TA100 and TA 102) OECD 471	Cas N°: 68956-82-1, 14024-48-7
Xylene 1330-20-7	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98, TA 100, TA 1538) similar to OECD 471	
N,N-dimethyl-p-toluidine 99-97-8	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98 and TA 100) OECD 471	
Maleic anhydride 108-31-6	negative In vitro gene mutation study in bacteria (S. typhimurium TA 1535, TA 1537, TA 98 and TA 100) similar to OECD 471	
Chemical Name	In vitro Mammalian Cell Gene Mutation Test	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	negative In vitro gene mutation study in mammalian cells mouse OECD 476	
Styrene 100-42-5	Ambiguous In vitro gene mutation study in mammalian cells hamster OECD 476	
Titanium dioxide 13463-67-7	negative In vitro gene mutation study in mammalian cells mouse OECD 476	
Amorphous Silica 7631-86-9	negative In vitro gene mutation study in mammalian cells OECD 476	
(2-methoxymethylethoxy)propanol 34590-94-8	negative In vitro gene mutation study in mammalian cells rat similar to OECD 482	
cobalt octoate 136-52-7	negative In vitro gene mutation study in mammalian cells mouse OECD 476	Cas N°: 7440-48-4, 1308-06-1, 10124- 43-3, 12016-80-7
Xylene 1330-20-7	negative In vitro gene mutation study in mammalian cells hamster mouse similar to EU Method B.19 EU Method B.17	

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Maleic anhydride 108-31-6	negative In vitro gene mutation study in mammalian cells hamster OECD 476	
Chemical Name	In vitro Mammalian Chromosome Aberration Test	Read-across (Analogy)
Styrene 100-42-5	positive Chromosome aberration test in vitro OECD 473 OECD 479	
Titanium dioxide 13463-67-7	negative Chromosome aberration test in vitro hamster OECD 473	
Amorphous Silica 7631-86-9	negative Chromosome aberration test in vitro OECD 473	
(2-methoxymethylethoxy)propanol 34590-94-8	negative Chromosome aberration test in vitro hamster similar to OECD 473	
Xylene 1330-20-7	negative Chromosome aberration test in vitro hamster similar to EU Method B.10	
N,N-dimethyl-p-toluidine 99-97-8	negative Chromosome aberration test in vitro hamster QSAR	

in vivo assay

Chemical Name	Unscheduled DNA Synthesis (UDS)	Read-across (Analogy)
Aluminium hydroxide 21645-51-2	negative rat OECD 474	
Styrene 100-42-5	negative mouse OECD 486 OECD 474	
Titanium dioxide 13463-67-7	negative rat OECD 474	
Amorphous Silica 7631-86-9	negative rat	
cobalt octoate 136-52-7	negative rat OECD 474 OECD 475	Cas N°: 68956-82-1, 14024-48-7, 10026-24-1
Xylene 1330-20-7	negative mouse rat similar to OECD 478	
Maleic anhydride 108-31-6	negative rat similar to OECD 475	

Carcinogenicity**Carcinogenicity****Aluminium hydroxide (21645-51-2)**

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Exposure routes	Method	Species	Dose	Evaluation
Inhalation	OECD TG 413	rat	LOAEC (toxicity powder) = 50 mg/m ³ air NOAEC (toxicity dust) = 50 mg/m ³ air	negative
Styrene (100-42-5)				
Exposure routes	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
Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 453	rat	NOAEL = 1800 - 3200 mg/kg bw/day	negative
Xylene (1330-20-7)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	similar to EU Method B.32	mouse rat	500 - 1000 mg/kg/bw/day (103 weeks)	negative
Maleic anhydride (108-31-6)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	similar to OECD 451	rat	NOAEL (carcinogenicity) >= 100 mg/kg bw/day NOEL (systemic toxicity) = 10 mg/kg bw/day 2 years	negative
Reproductive toxicity				
Reproductive toxicity				
Aluminium hydroxide (21645-51-2)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 422	rat	NOAEL (reproductive toxicity) = 1000 mg/kg bw/day Read across with Cas N° : 1327-41-9	negative
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	No information available	rat	NOAEL/LOAEL (fertility) 60d = 100 - 200 mg/kg bw/day	positive
Oral	OECD 422	rat	NOAEL/LOAEL (fertility) 60d = 200 - 400 mg/kg bw/day	positive

Inhalation	OECD 416	rat	NOAEC (P, F1) = 0.64 mg/L air LOAEC (P, F1) = 2.13 mg/L air NOAEC (F2) = 0.21 mg/L air LOAEC (F2) = 0.64 mg/L air (70d)	negative
Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 415	rat	NOAEL = 497 mg/kg bw/day	negative
cobalt octoate (136-52-7)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	Read-across (Analogy) Cas N°: 7440-48-4 OECD 422	rat	NO(A)EL (P&F1) 28d = 30 mg/kg bw/day	positive
Xylene (1330-20-7)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	similar to EPA OPPTS 870.3800	rat	NOAEC (vapour) reproductive and developmental toxicity > 500 ppm (2171 mg/m ³)	negative
N,N-dimethyl-p-toluidine (99-97-8)				
Exposure routes	Method	Species	Dose	Evaluation
No data available	QSAR	rat	LOEL (F2) = 72.97666 mg/kg bw/day	negative
Maleic anhydride (108-31-6)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	similar to OECD 416	rat	NOAEL (fertility) P/F1 = 55 mg/kg bw/day LOAEL (systemic) P/F1 = 20 mg/kg bw/day LOEL (local) P = 20 mg/kg bw/day	negative
Developmental Toxicity Suspected of damaging the unborn child.				
Developmental Toxicity				
Aluminium hydroxide (21645-51-2)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rat	NOAEL (embryotoxicity/teratogenicity) = 266 mg/kg bw/day	negative
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	No information available	rat	NOAEC/LOAEC (maternal toxicity + developmental toxicity) >50d = 1.08 - 2.15 mg/L air	positive
Inhalation	OECD 414	rat	LOAEC (maternal toxicity) 6-15d = 1.28 mg/L air	positive

Inhalation	OECD 414	rat	NOAEC (developmental toxicity) 6-15d >= 2.56 mg/L air	negative
Inhalation	OECD 414	rabbit	NOAEC (maternal toxicity + developmental toxicity) 6-18d = 2.56 mg/L air	negative
Titanium dioxide (13463-67-7)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rat	NOAEL (maternal & developmental toxicity) 20d = 1000 mg/kg bw/day	negative
Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	OECD 414	rat	NOAEL (maternal toxicity) = 1350 mg/kg bw/day NOAEL (teratogenicity) = 1350 mg/kg bw/day	negative
(2-methoxymethylethoxy)propanol (34590-94-8)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	EPA OTS 798.4350	rat	NOAEL (maternal tox/teratogenicity) 6-15d = 300 ppm	negative
Xylene (1330-20-7)				
Exposure routes	Method	Species	Dose	Evaluation
Inhalation	similar to OECD 414	rat	NOAEC (maternal and developmental toxicity) = 2171 mg/m ³ NOAEC (teratogenicity) >= 8684 mg/m ³	negative
Maleic anhydride (108-31-6)				
Exposure routes	Method	Species	Dose	Evaluation
Oral	similar to OECD 414	rat	NOAEL (maternal toxicity) = > 140 mg/kg bw/day NOAEL (teratogenicity) >= 140 mg/kg bw/day NOAEL (fetotoxicity) >= 140 mg/kg bw/day	negative

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

Specific target organ toxicity - exposure Causes damage to organs through prolonged or repeated exposure , target organ(s) : **repeated**
Central nervous system , Ears

STOT - repeated exposure				
Aluminium hydroxide (21645-51-2)				
Exposure routes	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/m ³ air	

Inhalation	OECD 412	rat	NOAEC (aerosol) = 3 mg/m ³ air LOAEC (aerosol) = 28 mg/m ³ air	
Styrene (100-42-5)				
Exposure routes	Method	Species	Dose	Remarks
Inhalation	OECD 412	rat mouse	NOAEC male (28d) = 3.47 mg/L air NOAEC (ototoxicity) 28d = 2.13 mg/L air NOAEC (28d) = 0.181 mg/L air NOAEC (28d) = 0.688 mg/L air	
Inhalation	No information available	rat	NOAEC (nasal tract) = 0.85 mg/L air NOAEC (overall) = 2.13 mg/L air NOAEC (ototoxicity) = 0.85 mg/L air LOAEC (ototoxicity) = 3.41 mg/L air NOAEC (overall) = 2.13 mg/L air	
Oral	No information available	rat	NOAEL (toxicity) = 1000 mg/kg bw/day LOAEL (toxicity) = 2000 mg/kg bw/day	
Oral	No information available	mouse	NOAEL (toxicity) = 150 mg/kg bw /day LOAEL (toxicity) = 300 mg/kg bw /day	
Inhalation	OECD 453	rat	LOAEC local (toxicity) = 0.21 mg/L air	

Titanium dioxide (13463-67-7)				
Exposure routes	Method	Species	Dose	Remarks
Oral	OECD 407	rat	NOEL (29d) = 24000 mg/kg bw/day	
Oral	OECD 408	rat	NOAEL (92-93d) > 1000 mg/kg/day	
Amorphous Silica (7631-86-9)				
Exposure routes	Method	Species	Dose	Remarks
Oral	OECD 408	rat	NOEL (highest dose) 4000 <= 4500 mg/kg bw/day 90d	
Inhalation	OECD 413	rat	NOEC = 1.3 mg/m ³ air NOEC < 1.3 mg/m ³ air 90d	
Dermal	No information available	rabbit	NOAEL >= 10000 mg/kg bw/day	
(2-methoxymethylethoxy)propanol (34590-94-8)				
Exposure routes	Method	Species	Dose	Remarks

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Oral	KANPOGYO No.700, YAKUHATSU No. 1039.61 and KIKYKU No. 1014	rat	NOEL/NOAEL (4 weeks) = 200/1000 mg/kg	
Inhalation	similar to OECD 413	rat	NOAEL (13 weeks) = 200 ppm	
Dermal	similar to OECD 411	rabbit	NOAEL (90d) = 2850 mg/kg bw/day	
cobalt octoate (136-52-7)				
Exposure routes	Method	Species	Dose	Remarks
Oral	Read-across (Analogy) cobalt dichloride hexahydrate OECD 408	rat	NOAEL (90d) = 3 mg/kg bw/day	
Xylene (1330-20-7)				
Exposure routes	Method	Species	Dose	Remarks
Oral	similar to EU Method B.32	rat	LOAEL (90d) male = 150 mg/kg bw/day NOAEL (90d) female = 150 mg/kg bw/day	
N,N-dimethyl-p-toluidine (99-97-8)				
Exposure routes	Method	Species	Dose	Remarks
Oral	QSAR	rat	LOEL (effect on body weight decrease) 91d = 201.7862 mg/kg bw/day	
Inhalation	QSAR	rat	LOEL (rat) = 67.28391 mg/kg bw/day	
Maleic anhydride (108-31-6)				
Exposure routes	Method	Species	Dose	Remarks
Oral	similar to OECD 408	rat	LOAEL (90 & 183d) = 250 mg/kg bw/day	
Oral	similar to OECD 409	dogs	NOAEL (90d) = 60 mg/kg bw/day	
Oral	similar to OECD 452	rat	NOEL (2 years) = 10 mg/kg bw/day LOEL (2 years) = 32 mg/kg bw/day	
Inhalation	similar to OECD 412	rat	LOAEC (local) = 0.01 mg/L air LOAEC (systemic) = 0.01 mg/L air 1 month	

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

Other information None

SECTION 12: Ecological information

12.1. Toxicity

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

Acute aquatic toxicity - Component Information

Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates.	Toxicity to fish	Toxicity to microorganisms
Aluminium hydroxide 21645-51-2	EC50 (72h) > 100 mg/L (Pseudokirchnerella subcapitata) OECD 201	EC50 (46h) > 100 mg/L (Daphnia magna) OECD 202	LC50 (96h) > 100 mg/L (Salmo trutta) OECD 203	
Styrene 100-42-5	EC50 (72h) = 4.9 mg/L (Pseudokirchnerella subcapitata) EPA OTS 797.1050	EC50 (48h) = 4.7 mg/L (Daphnia magna) NOEC = 1.9 mg/L (Daphnia magna) OECD 202	LC50 (96h) = 4.02 - 10 mg/L (Pimephales promelas) OECD 203	EC (30min) = 500 mg/L (Activated sludge of a predominantly domestic sewage) OECD 209
Titanium dioxide 13463-67-7	EC50 (72h) > 100 mg/L (Pseudokirchnerella subcapitata) NOEC (72h) >= 100 mg/L (Pseudokirchnerella subcapitata) OECD 201	EC50 (48h) > 100 mg/L (Daphnia magna) OECD 202	LC50 (96h) > 100 mg/L (Carassius auratus) NOEC (96h) >= 100 mg/L (Carassius auratus) OECD 203	EC50 (3h) > 1000 mg/L, NOEC (3h) >= 1000 mg/L (Activated sludge of a predominantly domestic sewage) OECD 209
Amorphous Silica 7631-86-9		EL50 (24h) >= 1000 mg/L (Daphnia magna) OECD 202	LC50 (96h) > 10000 mg/L (Brachydanio rerio) OECD 203	
(2-methoxymethylethoxy)propanol 34590-94-8	EC50 (72h) > 969 mg/L (Pseudokirchnerella subcapitata) OECD 201	LC50 (48h) = 1919 mg/L (Daphnia magna) Similar to OECD 202	LC50 (96h) > 1000 mg/L (Poecilia reticulata) OECD 203	EC10 (18h) = 4168 mg/L (Pseudomonas putida) No guideline followed
cobalt octoate 136-52-7	EC50 (72h) = 144 µg Codiss./L (Pseudokirchnerella subcapitata) NOEC (72h) = 32.2 µg./L (Pseudokirchnerella subcapitata) LOEC (72h) = 52.7 µg Codiss./L (Pseudokirchnerella subcapitata) OECD 201		LC50 (96h) = 1.512 mg/L (Oncorhynchus mykiss) NOEC (96h) = 0.939 mg/L (Oncorhynchus mykiss) LOEC (96h) = 1.577 mg/L (Oncorhynchus mykiss) ASTM guideline (1996)	EC10 (30 min) = 3.73 mg/L (Activated sludge) EC50 (30 min) = 120 mg/L (Activated sludge) Read across with Cas N°: 7646-79-9 OECD 209
Xylene 1330-20-7	EC50 (73h) = 2.2 mg/L (Pseudokirchnerella subcapitata) OECD 201	IC50 (24h) = 1 mg/L (Daphnia magna) OECD Guideline 202	LC50 (96h) = 2.6 mg/L (Oncorhynchus mykiss) OECD 203	EC50 (3h) > 157 mg/L (Activated sludge, domestic) NOEC (3h) = 157 mg/L (Activated sludge, domestic) OECD 209
N,N-dimethyl-p-toluidine 99-97-8	EC50 (72h) = 24.37002 mg/L (Pseudokirchnerella subcapitata) QSAR	EC50 (48h) = 23.758 mg/L (Daphnia magna) QSAR	LC50 (96h) = 46 mg/L (Pimephales promelas)	EC50 (48h) = 42.86365 mg/L (Tetrahymena thermophila) QSAR
Maleic anhydride 108-31-6	EC50 (72h) = 74.35 mg/L (Pseudokirchnerella subcapitata) OECD 201	EC50 (48h) = 42.81 mg/L (Daphnia magna) OECD 202	LC50 (96h) = 75 mg/L (Lepomis macrochirus, Oncorhynchus mykiss) EPA-660/3-75-009	EC10 (18h) = 44.6 mg/L (Pseudomonas putida) DIN 38412-8

Chronic aquatic toxicity - Component Information

Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates.	Toxicity to fish	Toxicity to microorganisms
Aluminium hydroxide 21645-51-2	NOEC (72h) >= 0.004 mg/L (Pseudokirchnerella subcapitata) OECD 201		NOEC (96h) > 48.2 mg/L (Pimephales promelas)	

Styrene 100-42-5		NOEC (21d) = 1.01 mg/L (Daphnia magna) LOEC (21d) = 2.06 mg/L (Daphnia magna) EC50 (21d) = 1.88 mg/L (Daphnia magna) OECD 203		
(2-methoxymethylethoxy)propanol 34590-94-8		NOEC (22d) >= 0.5 mg/L (Daphnia magna) Similar to OECD 211		
cobalt octoate 136-52-7	EC50 (7d) = 90.1 µg/L (Lemna minor) NOEC (7d) = 3.0 µg/L (Lemna minor) LOEC (7d) = 8.8 µg/L (Lemna minor) OECD 221	NOECR (21d) = 60.8 µg/L (Daphnia magna) LC50 (21d) = 121.3 mg/L (Daphnia magna) LOECR (21d) = 93.3 µg Codiss./L (Daphnia magna) OECD 211		
Xylene 1330-20-7	NOEC (73h) = 0.44 mg/L (Pseudokirchnerella subcapitata) OECD 201			
N,N-dimethyl-p-toluidine 99-97-8			LC50 (14d) = 24.892 mg/L (Fish)	
Maleic anhydride 108-31-6		NOEC (21d) = 10 mg/L (Daphnia magna) EC50 (21d) = 77 mg/L (Daphnia magna) No guideline followed		

Effects on terrestrial organisms - Component Information

Acute toxicity				
Xylene (1330-20-7)				
Acute toxicity	Test Method	Species	Values	Remarks
Other plants	OECD 208	Lactuca sativa	EC50 (14d) > 1000 µg/kg	
Chronic toxicity				
Styrene (100-42-5)				
Chronic toxicity	Method	Species	Values	Remarks
Toxicity to invertebrates	OECD 207	Eisenia foetida	LC50 (14d) = 120 mg/kg soil dw LOEC (burrowing time and mean percent weight change) = 65 mg/kg soil dw LOEC (survival) = 180 mg/kg soil dw NOEC (mean percent weight change) = 34 mg/kg soil dw	
(2-methoxymethylethoxy)propanol (34590-94-8)				
Chronic toxicity	Method	Species	Values	Remarks
plants	OECD 227	Grossypium hirsutum	NOEC (21d) = 250 g/L	

12.2. Persistence and degradability

Chemical Name	Biodegradation	Evaluation
Styrene 100-42-5	87% (20d) similar to OECD 301D	Readily biodegradable
(2-methoxymethylethoxy)propanol 34590-94-8	96 % (28d) DOC removal, 75 % (10d) OECD 301F	Readily biodegradable
cobalt octoate 136-52-7	60% (> 10d), OECD 301 B	Readily biodegradable
Xylene 1330-20-7	87.8% (28d) Read across with benzoic acid, sodium salt OECD 301 F	Readily biodegradable
N,N-dimethyl-p-toluidine 99-97-8	50 % (38d)	Readily biodegradable
Maleic anhydride 108-31-6	> 90 % (25d) Read across with : benzoic acid, sodium salt OECD 301 B	Readily biodegradable

12.3. Bioaccumulative potential

Bioconcentration factor (BCF)		
Styrene (100-42-5)		
Method	Species	Bioconcentration factor (BCF)
Calculation method		74
Xylene (1330-20-7)		
Method	Species	Bioconcentration factor (BCF)
No data available	Oncorhynchus mykiss	25.9 (56d)
N,N-dimethyl-p-toluidine (99-97-8)		
Method	Species	Bioconcentration factor (BCF)
Calculation method	Fish	33

Chemical Name	log Pow
Styrene 100-42-5	3
(2-methoxymethylethoxy)propanol 34590-94-8	0.0043
Xylene 1330-20-7	3.12 - 3.2
N,N-dimethyl-p-toluidine 99-97-8	2.81
Maleic anhydride 108-31-6	-2.61

12.4. Mobility in soil

Chemical Name	LogKoc	Koc
Styrene 100-42-5	2.55	352
Xylene 1330-20-7	2.73	537
N,N-dimethyl-p-toluidine 99-97-8	126.2	-
Maleic anhydride 108-31-6	1.63	42

12.5. Results of PBT and vPvB assessment

Chemical Name	PBT	vPvB
Aluminium hydroxide 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).
Styrene 100-42-5	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
Titanium dioxide 13463-67-7	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
Amorphous Silica 7631-86-9	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
(2-methoxymethylethoxy)propanol 34590-94-8	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).
Xylene 1330-20-7	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).
N,N-dimethyl-p-toluidine 99-97-8	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).
Maleic anhydride 108-31-6	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).	This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects None known.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**
Waste from Residues/Unused Products
Contaminated packaging**ods**

Dispose of in accordance with the European Directives on waste and hazardous waste.
Do not flush into surface water or sanitary sewer system

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Other information

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.
Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information**14.1. UN number 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
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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 IMDG/IMO	5 L

EmS	F-E, S-E
Limited quantity ICAO/IATA	5 L

ERG Code	3L
Limited quantity ADN	10 L

Classification Code	F1
Limited quantity ventilation	5 L VE01

Special precautions for users

Special precautions	No information available
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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. 830/2015
Directive 88/642/EEC
Directive 98/24/EC
Directive 1999/92/EC
Directive 2012/18/EU

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

European Union

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

H301 - Toxic if swallowed

H302 - Harmful if swallowed

H304 - May be fatal if swallowed and enters airways

H311 - Toxic in contact with skin

H312 - Harmful in contact with skin

H314 - Causes severe skin burns and eye damage

H315 - Causes skin irritation

H317 - May cause an allergic skin reaction

H318 - Causes serious eye damage

H319 - Causes serious eye irritation

H331 - Toxic if inhaled

H332 - Harmful if inhaled

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

H335 - May cause respiratory irritation

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

H373 - May cause damage to organs through prolonged or repeated exposure

H400 - Very toxic to aquatic life

H412 - Harmful to aquatic life with long lasting effects

EUH071 - Corrosive to the respiratory tract

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

Revision date

22-Jun-2022

Revision Note

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

Disclaimer

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

End of Safety Data Sheet

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

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

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

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

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

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

Table 1. Description of ES 1

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

Contributing Scenario (1) controlling environmental exposure for ERC 2

Operational conditions (referred to styrene)

Daily amount used at site	45700 kg/day (referred to styrene)
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Release times per year	300 days/year (justification: Continuous 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. Closed processes
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines. Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan. Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %

Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

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

Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Dissolving linear UP/VE polymer in blending vessel (or dissolver)
Qualitative Risk Assessment	
General	Use in semi-automated and predominantly enclosed filling lines; Drain down and flush system prior to equipment break-in or maintenance. Apply vessel entry procedures including use of forced supplied air. Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %

Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Equipment cleaning and maintenance. Cleaning and maintenance of blending vessel, road tankers etc.
Qualitative Risk Assessment	

General	<p>Use in semi-automated and predominantly enclosed filling lines.</p> <p>Drain or remove substance from equipment prior to break-in or maintenance.</p> <p>Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).</p> <p>Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.</p> <p>Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures.</p> <p>Use suitable chemically resistant gloves, tested to EN374.</p> <p>Use suitable eye protection.</p> <p>In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %

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

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur

Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (7) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Process sampling.
Qualitative Risk Assessment	
General	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour): Avoid dip sampling. Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 min.-1 hour
Frequency of use	5 days / week

Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	Good (>30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (8) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Drum/batch transfers; Pouring from small containers; Transfer from/pouring from containers; Mixing operations (open systems). Mixing liquid and solid components / into final formulated resin in blending vessel
Qualitative Risk Assessment	
General	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Keep lids of containers closed during blending. Ensure good work practices are implemented. Provide basic employee training to prevent/minimize exposures. Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.

Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (9) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment cleaning and maintenance. Cleaning and maintenance of pipes, pumps, filters, etc.
Qualitative Risk Assessment	

General	<p>Drain down system prior to equipment break-in or maintenance. Drain or remove substance from equipment prior to break-in or maintenance.</p> <p>Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures</p> <p>Wear suitable coveralls to prevent exposure to the skin.</p> <p>Use suitable eye protection.</p> <p>Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Contributing Scenario (10) controlling industrial worker exposure for PROC 8A

Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Disposal of wastes. Handling of non cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment
Qualitative Risk Assessment	

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

General	Fill containers/cans at dedicated fill points supplied with local extract ventilation. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (12) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 -Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Bulk transfers. All activities related to transport finished product to customer. Dispensing final UP/VE resin (linear UP/VE polymer + styrene + additives) / into storage tank, IBC, drum or pail.
Qualitative Risk Assessment	
General	Fill containers/cans at dedicated fill points supplied with local extract ventilation. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable chemically resistant gloves, tested to EN374. Use suitable eye protection.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (13) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Laboratory activities. All laboratory activities. Quality control work of samples from reactor and blending vessel. R&D work including handling of samples from 1 kg to 1 drum.
Qualitative Risk Assessment	
General	Carry out in a vented booth or extracted enclosure. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week

Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

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

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

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

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

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

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

Table 2. Description of ES 2

Free short title	FRP manufacturing in an industrial setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES2)
Systematic title based on use descriptor	ERC 6D; PROC 3, 5, 7, 8A, 10, 13, 14, 15

Name of contributing environmental scenario and corresponding ERC	ERC 6d Production of resins
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>PROC 7 - Industrial spraying</p> <p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 15 - Use of laboratory reagents in small scale laboratories</p>
Contributing Scenario (1) controlling environmental exposure for ERC 6D	
Operational conditions (<i>referred to styrene</i>)	
Daily amount used at site	161000 kg/day (<i>referred to styrene</i>)
Release times per year	300 days/year (<i>justification: Continuous release</i>)
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	0.102 %
Release fraction to wastewater from process	0.00063 %
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; Automated process with (semi) closed systems; Use in contained batch processes. Resin injection and transfer processes, such as vacuum infusion, RTM, impregnation of sewer relining sleeves
Qualitative Risk Assessment	
General Put lids on containers immediately after	use. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)

Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors

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

Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no

Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Drum/batch transfers; Pouring from small containers; Transfer from/pouring from containers; Mixing operations (open systems). Loading of mixing equipment; Preparation of material for application; (liquid products) - batch, indoor
Qualitative Risk Assessment	
General	Put lids on containers immediately after use. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium

Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Contributing Scenario (5) controlling industrial worker exposure for PROC 5

Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Casting operations; Mixing operations (open systems). Casting and mixing operations in (semi-) open containers. Examples are centrifugal casting, casting of polymer concrete and artificial marble and the manufacturing of SMC / BMC/ TMC, etc
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.

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

Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Spraying; Spraying (automatic/robotic) All open mould applications where resins is applied by automated spraying or by robot in a spray cabin without direct worker involvement. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding

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

Scenario subtitle	Spraying; Spraying (manually) All open mould applications where resins is applied by manual spraying in an open work environment. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding
Qualitative Risk Assessment	

General	Carefully pour from containers Use long handled tools where possible Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin Wear chemically resistant gloves tested to EN374 in combination with intensive management supervision control. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes

Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Yes
Local exhaust ventilation	inhalation: 95 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (9) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment maintenance; Maintenance of small items. Equipment cleaning and maintenance
Qualitative Risk Assessment	

General	Drain or remove substance from equipment prior to break-in or maintenance. Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (10) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Disposal of wastes. Handling of non cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment
Qualitative Risk Assessment	
General	Put lids on containers immediately after use. Contain and dispose of waste according to local regulations Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %

Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	Indoors/outdoor
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Rolling, Brushing; Roller, spreader, flow application All open mould applications where resins is applied by brushing, rolling and other low energy spreading operations; Examples are hand lamination, gelcoat brushing, filament winding
Qualitative Risk Assessment	

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

Qualitative Risk Assessment

General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)

Contributing Scenario (13) controlling industrial worker exposure for PROC 13

Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Dipping, immersion and pouring; Continuous process. Continuous processes with open impregnation steps, such as pultrusion with open impregnation baths and (semi-) continuous production of flat laminates
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes

Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 90 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (14) controlling industrial worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation
Scenario subtitle	Material transfers; Production or preparation or articles by tableting, compression, extrusion or pelletisation; Treatment by heating; Batch processes at elevated temperatures. Processes where curing of UP / VE resins takes place at high temperature. Examples are pultrusion with injection dies and processing of SMC / BMC / TMC, etc
Qualitative Risk Assessment	

General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures In case of potential exposure: Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	

Exposed skin surface	480 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	enhanced (70%)
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	inhalation: 70 % (<i>justification: Use local exhaust ventilation with adequate effectiveness</i>)
Contributing Scenario (15) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Laboratory activities. Quality control work of samples from blending vessel; R&D work including handling of samples from 1 kg to 1 drum
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week

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

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

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

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

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

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

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

Table 2. Description of ES 3

Free short title	FRP manufacturing in a professional setting, using UP/VE resins and/or formulated resins (gelcoat, bonding paste, putty etc.) (ES8)
Systematic title based on use descriptor	ERC 6C; PROC 3, 4, 5, 8A, 10, 11
Name of contributing environmental scenario and corresponding ERC	ERC 6c Production of plastics
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact)</p> <p>PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 11 - Non industrial spraying</p>
Contributing Scenario (1) controlling environmental exposure for ERC 6C	
Operational conditions (<i>referred to styrene</i>)	

Daily amount used at site	48300 kg/day (<i>referred to styrene</i>)
Release times per year	300 days/year (<i>justification: Continuous release</i>)
Local freshwater dilution factor	10
Local marine water dilution factor	100
Release fraction to air from process	0.102 %
Release fraction to wastewater from process	0.000012 %

Release fraction to soil from process	0 %
Fraction tonnage to region	10 %
Fraction used at main source	60 %
STP	Yes
River flow rate	18000 m ³ /day
Municipal sewage treatment plant discharge	2000000 L/day

Other modified EUSES values

Fraction released to agricultural soil (Femis.agric)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to industrial soil (Femis.ind)	0 % (<i>justification: No direct release to soil (EU Risk Assessment Report on Styrene, European Communities, 2002)</i>)
Fraction released to waste water (Femis.water)	0.000012 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction released to air (Femis.air)	0.102 % (<i>justification: EU Risk Assessment Report, 2002</i>)
Fraction used at main source	60 % (<i>justification: Value adopted to account for worst-case European manufacturing site</i>)
Fraction of emission directed to water by local STP (Fstp.water)	0.081 - (<i>justification: Efficiency STP 91.9%</i>)

Contributing Scenario (2) controlling professional worker exposure for PROC 3

Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
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Scenario subtitle	Use in contained batch processes. Application of chemical anchoring
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures In case of potential exposure: Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100%
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm ²
Other given operational conditions affecting workers exposure	
Location	outdoors (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	No
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur

Contributing Scenario (3) controlling professional worker exposure for PROC 4

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

Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs

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

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

Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness

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

Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Equipment maintenance; Maintenance of small items. Equipment cleaning and maintenance
Qualitative Risk Assessment	
General	Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	Yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure might occur
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (6) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Disposal of wastes. Handling of non cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment
Qualitative Risk Assessment	

General	Dispose of empty containers and wastes safely Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	15 mins to 1 hour
Frequency of use	5 days / week

Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (7) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Rolling, Brushing; Roller, spreader, flow application All open mould applications where resins is applied by brushing, rolling and other low energy spreading operations; Examples are hand lamination, gelcoat brushing, semicontinuous production of flat panels and laminates
Qualitative Risk Assessment	
General	Use long handled brushes and rollers where possible Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Use suitable chemically resistant gloves, tested to EN374. Wear suitable coveralls to prevent exposure to the skin. In case of potential exposure wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	Use respiratory protection when exposure occurs
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (8) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Dipping, immersion and pouring; Rolling, Brushing; Roller, spreader, flow application Application of repair putties; Application of bonding pastes / adhesives.
Qualitative Risk Assessment	

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

General Ensure good work practices are	<p>implemented</p> <p>Provide basic employee training to prevent/minimize exposures</p> <p>Use suitable eye protection.</p> <p>Use suitable chemically resistant gloves, tested to EN374.</p> <p>Wear suitable coveralls to prevent exposure to the skin.</p> <p>Wear a suitable respiratory protection with adequate effectiveness.</p>
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	
Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness
Contributing Scenario (10) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying

Scenario subtitle	Spraying; Spraying (manually) All open mould applications where resins is applied by manual spraying in an open work environment. Examples are spray lamination, gelcoat spraying and “chop-hoop” filament winding
Qualitative Risk Assessment	
General	Keep people not involved in the activity, away from the operation Ensure good work practices are implemented Provide basic employee training to prevent/minimize exposures Use suitable eye protection. Wear suitable face shield Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves, tested to EN374, in combination with intensive management supervision control. Wear a suitable respiratory protection with adequate effectiveness.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
Frequency and duration of use	
Duration of activity	1 - 4 hours
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm ²
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes
Conditions and measures related to personal protection, hygiene and health evaluation: see details on sec.8 of SDS	

Protective gloves	Gloves APF 5 80 %
Respiratory protection	yes
Local exhaust ventilation	Use local exhaust ventilation with adequate effectiveness



Metroflex Catalyst

Technical Data Sheet

Chemical name:	Dibenzoyl peroxide 50% with dicyclohexyl phthalate
Chemical formula:	[C ₆ H ₅ CO] ₂ O ₂
Molecular weight:	242.2 g/mol
Recommended storage temperature:	below 30°C
CAS-No.:	94-36-0
UN-NO.:	3106

Specification

Appearance:	white crystalline powder
Peroxide content:	49.0 – 52.5 %(w/w)
Active oxygen:	3.24 – 3.47 %(w/w)
Particle size:	≤ 500 μ

Shelf life: min. 12 months

Standard packaging: PE bag a 25 kgs of product
1 bag in a cardboard box
24 boxes on a pallet

Safety instruction

Please observe the information in the SDS-Safety Data Sheet.

Our specification does not relieve you from the obligation to test the goods for your own intents and purposes, since they are created by producers own test methods.



Metroflex Catalyst

Safety Data Sheet
according to Regulation
(EC) No. 2015/830

SECTION 1: Identification of the Substance/Mixture and the Company/Undertaking

1.1 Product Identifier	B.P.O	Revision Date:	25/06/2018
Product Name:	Metroflex Catalyst	Supersedes Date:	New SDS

1.2 Relevant identified uses of the substance or mixture and uses advised against Hardener for 2 component coatings - Industrial and professional use.

1.3 Details of the supplier of the safety data sheet

Manufacturer: CFSNET Ltd
United Downs Industrial Park
St Day, Redruth
Cornwall TR16 5HY

Regulatory / Technical Information:
+44(0)1209 821028
www.cfsnet.co.uk
sales@cfsnet.co.uk

Datasheet Produced by:

1.4 Emergency telephone number:

SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

Classification according to Classification, Labeling & Packaging Regulation (EC) 1272/2008

HAZARD STATEMENTS

Organic Peroxide, categories C, D	H242-CD
Skin Sensitizer, category 1	H317
Eye Irritation, category 2	H319
Reproductive Toxicity, category 2	H361
Hazardous to the aquatic environment, Acute, category 1	H400
Hazardous to the aquatic environment, Chronic, category 3	H412

2.2 Label elements

Symbol(s) of Product



Signal Word

Danger

Named Chemicals on Label

dicyclohexyl phthalate, dibenzoyl-peroxide

HAZARD STATEMENTS

Organic Peroxide, categories C, D	H242-CD	Heating may cause a fire.
Skin Sensitizer, category 1	H317	May cause an allergic skin reaction.
Eye Irritation, category 2	H319	Causes serious eye irritation.
Reproductive Toxicity, category 2	H361	Suspected of damaging fertility or the unborn child.
Hazardous to the aquatic environment, Acute, category 1	H400	Very toxic to aquatic life.
Hazardous to the aquatic environment, Chronic, category 3	H412	Harmful to aquatic life with long lasting effects.

PRECAUTION PHRASES

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P234	Keep only in original packaging.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	Wear respiratory protection.
P302+352	IF ON SKIN: Wash with plenty of soap and water.
P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
P308+313	IF exposed or concerned: Get medical advice/attention.
P333+313	If skin irritation or rash occurs: Get medical advice/attention.
P391	Collect spillage.
P403+235	Store in a well-ventilated place. Keep cool.

2.3 Other hazards

No Information

Results of PBT and vPvB assessment:

The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.

SECTION 3: Composition/Information On Ingredients

3.2 Mixtures

Hazardous Ingredients

<u>CAS-No.</u>	<u>EINEC No.</u>	<u>Name According to EEC</u>	<u>%</u>
84-61-7	201-545-9	dicyclohexyl phthalate	50-75
94-36-0	202-327-6	dibenzoyl-peroxide	50-75

<u>CAS-No.</u>	<u>REACH Reg No.</u>	<u>CLP Symbols</u>	<u>CLP Hazard Statements</u>	<u>M-Factors</u>
84-61-7	01-2119978223-34	GHS07-GHS08	H317-361-412	
94-36-0	01-2119511472-50	GHS02-GHS07-GHS09	H242-317-319-400	

Additional Information: The text for CLP Hazard Statements shown above (if any) is given in Section 16.

SECTION 4: First-aid Measures

4.1 Description of First Aid Measures

GENERAL NOTES: When symptoms persist or in all cases of doubt seek medical advice.

AFTER INHALATION: Move to fresh air. Give oxygen or artificial respiration if needed.

AFTER SKIN CONTACT: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

AFTER EYE CONTACT: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. If eye irritation persists, consult a specialist.

AFTER INGESTION: Never give anything by mouth to an unconscious person. If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel. If swallowed, call a poison control centre or doctor immediately.

Self protection of the first aider:

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Harmful by inhalation. May cause sensitization by skin contact. Irritating to eyes, respiratory system and skin.

4.3 Indication of any immediate medical attention and special treatment needed

No information available on clinical testing and medical monitoring. Specific toxicological information on substances, if available, can be found in section 11.

SECTION 5: Fire-fighting Measures

5.1 Extinguishing Media:

Carbon Dioxide, Dry Chemical, Foam, Water Fog

FOR SAFETY REASONS NOT TO BE USED: Alcohol, Alcohol based solutions, any other media not listed above. Do not use a solid water stream as it may scatter and spread fire. Halogenated compounds.

5.2 Special hazards arising from the substance or mixture

May reignite after fire has been extinguished.

5.3 Advice for firefighters

Fire will produce dense black smoke containing hazardous combustion products (see section 10). Flash back possible over considerable distance. In the event of fire, wear self-contained breathing apparatus. Hazardous decomposition products formed under fire conditions. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Use personal protective equipment. Remove all sources of ignition.

6.2 Environmental precautions

Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Pick up and transfer to properly labelled containers. Do not let product enter drains. Avoid breathing dust.

6.4 Reference to other sections

FURTHER INSTRUCTIONS: Please refer to EU disposal requirements or country specific disposal requirements for this material. See Section 13 for further information.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Use only in area provided with appropriate exhaust ventilation. Wear personal protective equipment. Avoid contact with skin and eyes. Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke.

7.2 Conditions for safe storage, including any incompatibilities

CONDITIONS TO AVOID: Direct sources of heat.

STORAGE CONDITIONS: Keep tightly closed in a dry and cool place. Keep locked up or in an area accessible only to qualified or authorised persons. Store away from: Reducing agents (e.g. amines), acids, alkalis, and heavy metal compounds, (e.g. accelerators, drying agents, metal soaps). Keep away from combustibles and flammable materials.

7.3 Specific end use(s)

No specific advice for end use available.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Ingredients with Occupational Exposure Limits (UK WELS)

Name	CAS-No.	LTEL ppm	STEL ppm	STEL mg/m ³	LTEL mg/m ³
dicyclohexyl phthalate	84-61-7				5
dibenzoyl-peroxide	94-36-0				5

Name	CAS-No.	OEL Note
dicyclohexyl phthalate	84-61-7	
dibenzoyl-peroxide	94-36-0	

FURTHER ADVICE: Refer to the regulatory exposure limits for the workforce enforced in each country. Some components may not have been classified under the EU CLP Regulation.

8.2 Exposure controls

Personal Protection

RESPIRATORY PROTECTION: Suitable mask with particle filter P3 (European Norm 143)

EYE PROTECTION: Safety glasses with side-shields conforming to EN166.

HAND PROTECTION: Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374. Long sleeved clothing. Remove and wash contaminated clothing before re-use.

OTHER PROTECTIVE EQUIPMENT: Ensure that eyewash stations and safety showers are close to the workstation location.

ENGINEERING CONTROLS: Avoid contact with skin, eyes and clothing. Ensure adequate ventilation, especially in confined areas.

Chemical Name:

dibenzoyl-peroxide

EC No.:

202-327-6

CAS-No.:

94-36-0

DNELs - Derived no effect level

Route of Exposure	Workers				Consumers			
	Acute effect local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effect local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	Not required							1.65 mg/kg bw/d
Inhalation				11.75 mg/m ³				2.9 mg/m ³
Dermal				6.6 mg/kg bw/d				3.3 mg/kg

PNEC's - Predicted no effect concentration

Environmental protection target	PNEC
Fresh water	0.602 mg/l
Fresh water sediments	0.338 mg/kg
Marine water	0.0602 mg/l
Marine sediments	0.0338 mg/kg
Food chain	6.67 mg/kg
Microorganisms in sewage treatment	0.35 mg/l
soil (agricultural)	0.0758 mg/kg
Air	

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance:	white free flowing powder
Physical State	Solid
Odor	Faint
Odor threshold	Not determined
pH	Not determined
Melting point / freezing point (°C)	Not determined
Boiling point/range (°C)	N.D. - N.D.
Flash Point, (°C)	N/A
Evaporation rate	Not determined
Flammability (solid, gas)	Decomposition products maybe flammable.
Upper/lower flammability or explosive limits	Not determined
Vapour Pressure	Not determined
Vapour density	Not determined
Relative density	1230 kg/m ³
Solubility in / Miscibility with water	Insoluble
Partition coefficient: n-octanol/water	Not determined
Auto-ignition temperature (°C)	Not determined
Decomposition temperature (°C)	Self-Accelerating decomposi-tion temperature (SADT) : 55°C
Viscosity	Not determined
Explosive properties	Not determined
Oxidising properties	N/A

9.2 Other information

VOC Content g/l:	0
Specific Gravity (g/cm³)	1.230

SECTION 10: Stability and Reactivity

10.1 Reactivity

Explosive reaction may occur on heating or burning. Strong oxidising agent: Avoid contact with reducing agents.

10.2 Chemical stability

Stable under recommended storage conditions. To avoid thermal decomposition, do not overheat. Self-Accelerating decomposition temperature (SADT): 55°C.

10.3 Possibility of hazardous reactions

Hazardous polymerisation does not occur. Contact with incompatible materials may result in a self-accelerating decomposition reaction at or below SADT.

10.4 Conditions to avoid

Direct sources of heat.

10.5 Incompatible materials

Strong oxidizing agents. Reducing agents. Heavy metals Incompatible with strong acids and bases.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Benzoic acid.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity:	
Oral LD50:	No Information
Inhalation LC50:	>24.3 mg/l
Irritation:	No information available.
Corrosivity:	No information available.
Sensitization:	No information available.
Repeated dose toxicity:	No information available.
Carcinogenicity:	No information available.
Mutagenicity:	No information available.
Toxicity for reproduction:	No information available.
STOT-single exposure:	No information available.
STOT-repeated exposure:	No information available.
Aspiration hazard:	No information available.

If no information is available above under Acute Toxicity then the acute effects of this product have not been tested. Data on individual components are tabulated below:

<u>CAS-No.</u>	<u>Name According to EEC</u>	<u>Oral LD50</u>	<u>Dermal LD50</u>	<u>Vapor LC50</u>
94-36-0	dibenzoyl-peroxide	>5000 mg/kg		>24.3 mg/L (4 hr)

Additional Information:

No Information

SECTION 12: Ecological Information

12.1 Toxicity:

EC50 48hr (Daphnia):	Not available
IC50 72hr (Algae):	Not available
LC50 96hr (fish):	Not available

12.2 Persistence and degradability: No information**12.3 Bioaccumulative potential:** No information**12.4 Mobility in soil:** No information**12.5 Results of PBT and vPvB assessment:** The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.**12.6 Other adverse effects:** No information

<u>CAS-No.</u>	<u>Name According to EEC</u>	<u>EC50 48hr</u>	<u>IC50 72hr</u>	<u>LC50 96hr</u>
84-61-7	dicyclohexyl phthalate	No information	No information	
94-36-0	dibenzoyl-peroxide	0.11 mg/l	0.06 mg/l	0.06 mg/l

SECTION 13: Disposal Considerations

- 13.1 WASTE TREATMENT METHODS:** Uncontrolled disposal or recycling of this packaging is not permitted and can be dangerous. Dispose of in accordance with local regulations. Empty containers should be taken to an approved waste handling site for recycling or disposal.

European Waste Code: No Information
Packaging Waste Code: 150110

SECTION 14: Transport Information

- | | |
|--|---|
| 14.1 UN number | 3106 |
| 14.2 UN proper shipping name | Organic Peroxide type D, solid (Dibenzoyl peroxide) |
| Technical name | Not applicable |
| 14.3 Transport hazard class(es) | 5.2 |
| Subsidiary shipping hazard | Not applicable |
| 14.4 Packing group | Not applicable |
| 14.5 Environmental hazards | Marine Pollutant |
| 14.6 Special precautions for user | Not applicable |
| EmS-No.: | F-J S-R |
| 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code | Not applicable |

SECTION 15: Regulatory Information

- 15.1 Safety, health and environmental regulations/legislation for the substance or mixture:**

National Regulations:

Denmark Product Registration Number: Not available

Danish MAL Code: Not available

Danish MAL Code - Mixture: Not available

Sweden Product Registration Number: Not available

Norway Product Registration Number: Not available

Germany WGK Class: Not available

Covered by Directive 2012/18/EC (Seveso III): P6b, E1

Restrictions to product or to substances according to Annex XVII, Regulation (CE) 1907/2006: Not applicable

- 15.2 Chemical Safety Assessment:**

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: Other Information

Text for CLP Hazard Statements shown in Section 3 describing each ingredient:

H242	Heating may cause a fire.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H361	Suspected of damaging fertility or the unborn child.
H400	Very toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Reasons for revision

No Information

List of References:

This Safety Data Sheet was compiled with data and information from the following sources:

The Ariel Regulatory Database provided by the 3E Corporation in Copenhagen, Denmark;
 European Union Commission Regulation No. 1907/2006 on REACH as amended within Commission Regulation (EU) 2015/830;
 European Union (EC) Regulation No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) and subsequent technical progress adaptations (ATP);
 EU Council Decision 2000/532/EC and its Annex entitled "List of Wastes".

Acronym & Abbreviation Key:

CLP	Classification, Labeling & Packaging Regulation
EC	European Commission
EU	European Union
US	United States
CAS	Chemical Abstract Service
EINECS	European Inventory of Existing Chemical Substances
REACH	Registration, Evaluation, Authorization of Chemicals Regulation
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
LTEL	Long term exposure limit
STEL	Short term exposure limit
OEL	Occupational exposure limit
ppm	Parts per million
mg/m ³	Milligrams per cubic meter
TLV	Threshold Limit Value
ACGIH	American Conference of Governmental Industrial Hygienists
OSHA	Occupational Safety & Health Administration
PEL	Permissible Exposure Limits
VOC	Volatile organic compounds
g/l	Grams per liter
mg/kg	Milligrams per kilogram
N/A	Not applicable
LD50	Lethal dose at 50%
LC50	Lethal concentration at 50%
EC50	Half maximal effective concentration
IC50	Half maximal inhibitory concentration
PBT	Persistent bioaccumulative toxic chemical
vPvB	Very persistent and very bioaccumulative
EEC	European Economic Community
ADR	International Transport of Dangerous Goods by Road
RID	International Transport of Dangerous Goods by Rail
UN	United Nations
IMDG	International Maritime Dangerous Goods Code
IATA	International Air Transport Association
MARPOL	International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978
IBC	International Bulk Container
RTI	Respiratory Tract Irritation
NE	Narcotic Effects

For further information, please contact: Technical Services Department

The information on this sheet corresponds to our present knowledge. It is not a specification and it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage, and use of the product. It is not applicable to unusual or non-standard uses of the product or where instructions and recommendations are not followed.



Metal, Concrete, Wood, Polymer, and Tile Substrates

Product Description

Metroflex Primer is a low viscosity, colourless, two (2) component reactive resin based on methyl methacrylate (MMA). It is part of an innovative waterproofing system that supports tight completion timelines of projects and ensures long- term performance and resilience.

Basic Uses

Metroflex Primer is applied before a Metroflex membrane, providing excellent bonding to metal (iron, aluminum, stainless steel), concrete, wood, fiber-reinforced polymers and ceramic tile substrates. Curing and adhesion tests conducted on the applicable substrate are strongly recommended prior to general use on site.

Features and Benefits

- Rapid cure times allow for base coat application within 45 minutes.
- Acceptable for use at temperatures as low as -4 °F (-20 °C), offering continuation of projects in colder months.
- Initiator volume adjustments allow for 20 to 45 minutes cure time between applications independent of temperature.
- Unique chemistry allows for easy repairs and adhesion of subsequent coats.
- Exhibits excellent adhesion to many types of substrates.
- Easy to mix and apply.

Physical Properties*

Property	Test Method	Value
Viscosity @ 77 °F (25 °C)	DIN 53019	100 – 130 mPa*s
Density @ 77 °F (25 °C)	ISO 2811	0.99 g/ml
Pot Life @ 68 °F (20 °C)		approx. 15 minutes
Curing Time @ 68 °F (20 °C)		approx. 30 minutes

*Please note that an objective comparison with other data is only possible if norms and parameters are identical.

Packaging

- 20kg / pail
- 180kg / drum

Installation Substrate

Preparation

- All substrates must be dry, firm, solid and free of dust, grease and oil. Laitance and loose particles must be thoroughly removed, usually by shot or sand blasting to attain correct surface profile. Newly poured concrete must have reached adequate strength to receive Metroflex system.
- Prepare surface structure for the correct application of the primer. Mechanical preparation should expose concrete aggregate. Fill visible pin holes and crates using filled primer or suitable cement mortar.
 - Substrate tensile strength = min 1.5 MPa.

Installation

Mixing

- Prior to use, Metroflex Primer must be carefully stirred to achieve uniform distribution of the paraffin in the product, normally a minimum of three (3) minutes.
- Metroflex Primer is thoroughly mixed together with Metroflex Reactive Filler (25% dibenzoyl peroxide) or Metroflex Catalyst (50% dibenzoyl peroxide), in accordance with the following guidelines. The amount of initiator powder to be added depends on the substrate temperature.

Temp F	Temp C	Pumacrete Reactive Filler	Pumacrete Catalyst	Pumacrete Accelerator
86 °F	30 °C	2.2% by weight of resin	1% by weight of resin	n/a
68 °F	20 °C	4% by weight of resin	2% by weight of resin	n/a
50 °F	10 °C	8% by weight of resin	4% by weight of resin	n/a
32 °F	0 °C	10% by weight of resin	5% by weight of resin	n/a
<32 °F	<0 °C	12% by weight of resin	6% by weight of resin	1-3% by weight of resin

Note: For safety reasons, Metroflex Accelerator must be added to reactive resin PRIOR to adding any initiator. See TDS Metroflex Accelerator for more details.

Application

- After the initiator has been stirred in, the primer is poured on to the substrate in stripes and distributed with a short- pile paint roller. A notched rubber squeegee may be used for fast distribution of large quantities; this may consume more material.
- Apply at a rate of between 0.3 to 0.5 kg/m², depending on density and porosity of the substrate. Continue applying primer until saturation occurs to obtain a continuous resin film. On porous substrates, a second prime coat may be required.
- When a continuous resin film is obtained, broadcast fire-dried quartz sand (particle size 0.7 to 1.2 mm or 0.3 to 0.7 mm) into the still wet primer (consumption of broadcast sand; approximately 0.3 kg/m²).
- Do not apply when surface temperature is above 104°F (40°C) and/or rapidly rising. Special care must be observed if area is exposed to direct sunlight.
- Substrate temperature must be at least 3° over actual dew point and rising.

The techniques involved may require modification to adjust to job-site specific conditions. Consult your CFSNET Ltd Sales Representative for site conditions and requirements. For further installation details, see our General Preparation and Application Guidelines for "Metroflex GRP Roofing System".

Limitations/ Shelf Life

One (1) year when stored in a dry place in original, closed containers. Optimal storage temperature: 60 to 70°F (15 to 20°C)

Warranty

CFSNET Ltd warrants its Products to be free of defects in materials but makes no warranty as to appearance or colour. Since methods of application and on-site conditions are beyond our control and can affect performance, CFSNET Ltd makes no other warranty, expressed or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE with respect to CFSNET Ltd. CFSNET Ltd's sole obligation shall be, at its option, to replace or to refund the purchase price of the quantity of CFSNET Ltd Products proven to be defective, and CFSNET Ltd shall not be liable for any loss or damage.

Please refer to our website at www.cfsnet.co.uk for the most up-to-date Product Data Sheets.

NOTE: All CFSNET Ltd Safety Data Sheets (SDS) are in alignment with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) requirements.

Version 1.1



Safety Data Sheet

Metroflex Primer

Revision Date 17-Sep-2021
Version 1.01

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name METROFLEX PRIMER

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

Recommended Use Primers

1.3 Details of the supplier of the safety data sheet

Supplier CFSNET Ltd
United Downs Industrial Park
St Day, Redruth
Cornwall TR16 5HY

Email: sales@cfsnet.co.uk
Phone: +44 (0) 1209 821028
This telephone number is available during office hours only

For further information, please contact: sales@cfsnet.co.uk

1.4 Emergency telephone number

Emergency telephone number 01209 821028

Europe	112
Austria	+43 1 406 43 43
Belgium	Poison center (BE): +32 70 245 245
Denmark	Poison Control Hotline (DK): +45 82 12 12 12
Finland	Poison Information Centre (FI): +358 9 471 977
France	ORFILA (FR): + 01 45 42 59 59
Germany	Poison Center Berlin (DE): +49 030 30686 790 Poison Center Nord: +49 551 19240 (24h available English / German)
Ireland	National Poisons Information Centre (IE): +353 1 8379964 / + 353 1 8092566
Iceland	+354 543 2222
Italy	Poison Centre, Milan (IT): +39 02 6610 1029
Luxembourg	112
Netherlands	National Poisons Information Centre (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Norway	Poisons Information (NO): + 47 22 591300
Portugal	Poison Information Centre (PT): +351 800 250 250
Spain	Poison Information Service (ES): +34 91 562 04 20
Sweden	Poisons Information Center (SV): +46 8 33 12 31
Switzerland	Poison Center: Tel 145; +41 44 251 51 51
United Kingdom	111 / 0300 020 0155

2. Hazards identification

2.1 Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Skin corrosion/irritation	Category 2 - (H315)
Skin sensitisation	Category 1 - (H317)
Specific target organ toxicity (single exposure)	Category 3 - (H335)
Flammable liquids	Category 2 - (H225)

2.2 Label elements



Signal Word

Danger

Hazard Statements

H315 - Causes skin irritation

H317 - May cause an allergic skin reaction

H335 - May cause respiratory irritation

H225 - Highly flammable liquid and vapour

Precautionary Statements - EU (§28, 1272/2008)

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P243 - Take action to prevent static discharges

P271 - Use only outdoors or in a well-ventilated area

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P273 - Avoid release to the environment

Contains METHYL METHACRYLATE, ETHYLENGLYCOL DIMETHACRYLATE

2.3. Other Hazards

No information available

3. Composition/information on ingredients

3.1 Substances

This product is a mixture. Health hazard information is based on its components

3.2 Mixtures

METROFLEX PRIMER

Chemical Name	EC-No	CAS No.	Weight-%	GHS Classification	REACH Registration Number
METHYL METHACRYLATE	201-297-1	80-62-6	50 - 75	STOT SE 3 (H335) Skin Irrit. 2 (H315) Skin Sens. 1 (H317) Flam Liq. 2 (H225)	01-2119452498-28-XX XX
ETHYLENGLYCOL DIMETHACRYLATE	202-617-2	97-90-5	2.5 - 10	Skin Sens. 1 (H317) STOT SE 3 (H335)	01-2119965172-38-XX XX
METHYL-HYDROXYETHYL-PARATOLUIDINE	220-638-5	2842-44-6	1 - 2.5	Eye Irrit. 2 (H319) Skin Sens. 1 (H317) Aquatic Chronic 2 (H411)	01-2120827830-56-XX XX
2-PROPENOIC ACID, 2-METHYL-	201-204-4	79-41-4	< 0.1	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Skin Corr. 1A (H314)	01-2119463884-26-XX XX

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

4. First Aid Measures

4.1 Description of first aid measures

General advice	Move out of dangerous area. Take off all contaminated clothing immediately.
Inhalation	Move to fresh air. Keep respiratory tract clear. If unconscious place in recovery position and seek medical advice. If not breathing, give artificial respiration. Call a physician if irritation develops or persists.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician if irritation develops or persists.
Eye contact	Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult a physician.
Ingestion	Gently wipe or rinse the inside of the mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	No information available.
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4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Treat symptomatically.
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5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Dry powder, Carbon dioxide (CO₂), Alcohol-resistant foam.

Extinguishing media which shall not be used for safety reasons

High volume water jet.

5.2 Special hazards arising from the substance or mixture

Explosive reaction may occur on heating or burning. Burning produces irritant fumes. Flash back possible over considerable distance. Hazardous decomposition products formed under fire conditions.

Hazardous Combustion Products

Carbon monoxide Carbon dioxide (CO₂) Thermal decomposition can lead to release of irritating and toxic gases and vapours

5.3 Advice for firefighters

In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Keep containers and surroundings cool with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures**Personal precautions**

Use personal protective equipment. Remove all sources of ignition. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes and clothing.

Advice for emergency responders

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not allow material to contaminate ground water system.

6.3 Methods and materials for containment and cleaning up**Methods for Containment**

Contain and collect spillage 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).

Methods for cleaning up

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Use only explosion-proof equipment.

6.4 Reference to other sections

See section 8 for more information.

7. Handling and storage

7.1 Precautions for safe handling**Advice on safe handling**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Provide exhaust ventilation close to floor level. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Open drum carefully as content may be under pressure. Use only in well-ventilated areas. Vapours may form explosive mixtures with air. Keep product and empty container away from heat and sources of ignition. Take measures to prevent the build up of electrostatic charge. Do not use sparking tools. Use only explosion-proof equipment. Have fire extinguishers ready before opening the drum.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. When using, do not eat, drink or smoke. Keep away from food, drink and animal feedingstuffs. Keep working clothes separately.

7.2 Conditions for safe storage, including any incompatibilities**Storage Conditions**

Store in original container. Never fill containers more than 80 % because aerial oxygen is necessary for stabilising. Store between 5 and 25 °C in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Keep in an area equipped with solvent resistant flooring. Do not store together with oxidizing and self-igniting products.

7.3 Specific end uses

Specific use(s)

No information available

Exposure scenario

No information available.

8. Exposure controls/personal protection**8.1 Control parameters****Exposure Limit Values**

Chemical Name	European Union	Austria	Belgium	Denmark	Finland	France
METHYL METHACRYLATE 80-62-6		STEL 100 ppm STEL 420 mg/m ³ TWA: 50 ppm TWA: 210 mg/m ³	TWA: 50 ppm TWA: 208 mg/m ³ STEL: 100 ppm STEL: 416 mg/m ³	TWA: 25 ppm TWA: 102 mg/m ³ Skin	TWA: 10 ppm TWA: 42 mg/m ³ STEL: 50 ppm STEL: 210 mg/m ³	TWA: 50 ppm TWA: 205 mg/m ³ STEL: 100 ppm STEL: 410 mg/m ³
2-PROPENOIC ACID, 2-METHYL- 79-41-4		TWA: 20 ppm TWA: 70 mg/m ³	TWA: 20 ppm TWA: 71 mg/m ³	TWA: 20 ppm TWA: 70 mg/m ³	TWA: 20 ppm TWA: 71 mg/m ³	TWA: 20 ppm TWA: 70 mg/m ³
Chemical Name	Germany	Iceland	Ireland	Italy	Luxembourg	The Netherlands
METHYL METHACRYLATE 80-62-6	TWA: 50 ppm TWA: 210 mg/m ³	TWA: 50 ppm S* Ceiling: 100 ppm STEL: 100 ppm	TWA: 50 ppm STEL: 100 ppm	STEL: 100 ppm STEL: 410 mg/m ³ TWA: 50 ppm TWA: 205 mg/m ³	STEL: 100 ppm TWA: 50 ppm	STEL: 410 mg/m ³ TWA: 205 mg/m ³
2-PROPENOIC ACID, 2-METHYL- 79-41-4	TWA: 5 ppm TWA: 18 mg/m ³	TWA: 20 ppm TWA: 70 mg/m ³ Ceiling: 40 ppm Ceiling: 140 mg/m ³	TWA: 20 ppm TWA: 70 mg/m ³ STEL: 40 ppm STEL: 140 mg/m ³	TWA: 20 ppm TWA: 70 mg/m ³		
Chemical Name	Norway	Portugal	Spain	Sweden	Switzerland	The United Kingdom
METHYL METHACRYLATE 80-62-6	TWA: 25 ppm TWA: 100 mg/m ³ Skin STEL: 100 ppm STEL: 400 mg/m ³	STEL: 100 ppm TWA: 50 ppm	STEL: 100 ppm TWA: 50 ppm	LLV: 50 ppm LLV: 200 mg/m ³ S* STV: 150 ppm STV: 600 mg/m ³	STEL: 100 ppm STEL: 420 mg/m ³ TWA: 50 ppm TWA: 210 mg/m ³	STEL: 100 ppm STEL: 416 mg/m ³ TWA: 50 ppm TWA: 208 mg/m ³
2-PROPENOIC ACID, 2-METHYL- 79-41-4	TWA: 20 ppm TWA: 70 mg/m ³ STEL: 30 ppm STEL: 105 mg/m ³	TWA: 20 ppm	TWA: 20 ppm TWA: 72 mg/m ³	LLV: 20 ppm LLV: 70 mg/m ³ STV: 30 ppm STV: 100 mg/m ³	STEL: 10 ppm STEL: 36 mg/m ³ TWA: 5 ppm TWA: 18 mg/m ³	STEL: 40 ppm STEL: 143 mg/m ³ TWA: 20 ppm TWA: 72 mg/m ³

TWA: time weighted average
 STEL: Short term exposure limit
 LLV: Exposure Limit Values
 STV: Short Term Value

Derived No Effect Level (DNEL) No information available

Predicted No Effect Concentration (PNEC) No information available

8.2 Exposure controls**Engineering Measures**

Ensure adequate ventilation, especially in confined areas.

Personal protective equipment**Eye/Face Protection****Hand Protection**

Eye wash bottle with pure water. Safety glasses with side-shields.

Solvent-resistant gloves. Suitable material: butyl-rubber. Glove thickness. >= 0.7 mm. Break through time > 60 minutes. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Wear suitable gloves tested to EN 374. Gloves should be replaced regularly and if there is any sign of damage to the glove material. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred.

Skin and body protection

Wear suitable protective clothing. Flame retardant antistatic protective clothing. Remove

Respiratory protection	and wash contaminated clothing before re-use. In case of insufficient ventilation wear suitable respiratory equipment. Filter type: A - A/P2. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Preferably a compressed airline breathing apparatus.
Recommended Filter type:	A - A/P2 .
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. When using, do not eat, drink or smoke. Keep away from food, drink and animal feedingstuffs. Keep working clothes separately.
Environmental exposure controls	Prevent product from entering drains. Do not allow material to contaminate ground water system.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Liquid
Colour	Colourless
Odour	acrylic-like
Odour Threshold	0.05 ppm

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH		
Melting/freezing point	-48 °C (MMA) / -54 °F	
Boiling point/boiling range	101 °C (MMA) / 214 °F	
Flash Point	12 °C (MMA) / 54 °F	
Evaporation rate	no data available	No information available
Flammability (solid, gas)		No information available
Flammability Limits in Air		
upper flammability limit		No information available
lower flammability limit		No information available
Upper explosion limit	12.5 Vol.% (MMA)	
Lower explosion limit	2.1 Vol.% (MMA)	
Vapour pressure	38.7 mbar (MMA)	(Air = 1.0)
Vapour density		No information available
Specific Gravity		No information available
Water solubility	Insoluble	
Solubility in other solvents		No information available
Partition coefficient	1.38 log POW (MMA)	
Autoignition temperature		No information available
Decomposition temperature		No information available
Viscosity, kinematic	100 - 130 mPa.s (25 °C)	
Viscosity, dynamic		No information available
Explosive properties		No information available
Oxidising Properties		No information available

9.2 Other information

Volatile organic compounds (VOC) content	No information available
Density	0.99 g/cm ³ (25 °C)

10. Stability and Reactivity

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Polymerisation occurs when exposed to white light, ultraviolet light or heat. Polymerisation is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

Polymerisation occurs when exposed to white light, ultraviolet light or heat. Polymerisation is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

10.4 Conditions to Avoid

Heat, flames and sparks. Exposure to sunlight.

10.5 Incompatible Materials

Avoid radical-forming starting agents, peroxides and reactive metals, Amines, Heavy metal compounds, Oxidizing agents, Reducing agents

10.6 Hazardous Decomposition Products

No hazardous decomposition products are known.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product Information

Inhalation	Irritating to mucous membranes. May cause respiratory irritation.
Eye contact	There are no data available for this product.
Skin contact	Causes skin irritation. May cause an allergic skin reaction.
Ingestion	There are no data available for this product.

The following values are calculated based on chapter 3.1 of the GHS document

Unknown Acute Toxicity

- < 1 % of the mixture consists of ingredient(s) of unknown toxicity
- < 1 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
- < 1 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
- < 1 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
- < 1 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapour)
- < 1 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
METHYL METHACRYLATE	> 5000 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	29.8 mg/l (Rat)

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation	No information available.
Respiratory or skin sensitisation	May cause allergic skin reaction. May cause respiratory irritation.
Germ Cell Mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	No information available.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	No information available.
Target Organs	Eyes. Respiratory system. Skin.
Aspiration hazard	No information available.

12. Ecological information

12.1 Toxicity

< 1 % of the mixture consists of components(s) of unknown hazards to the aquatic environment

Ecotoxicity effects

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
METHYL METHACRYLATE	EC50: 96 h <i>Pseudokirchneriella subcapitata</i> 170 mg/L	LC50: 96 h <i>Pimephales promelas</i> 243 - 275 mg/L flow-through LC50: 96 h <i>Pimephales promelas</i> 125.5 - 190.7 mg/L static LC50: 96 h <i>Lepomis macrochirus</i> 170 - 206 mg/L flow-through LC50: 96 h <i>Lepomis macrochirus</i> 153.9 - 341.8 mg/L static LC50: 96 h <i>Oncorhynchus mykiss</i> 79 mg/L flow-through LC50: 96 h <i>Oncorhynchus mykiss</i> 79 mg/L static LC50: 96 h <i>Poecilia reticulata</i> 326.4 - 426.9 mg/L static	EC50: 48 h <i>Daphnia magna</i> 69 mg/L

12.2 Persistence and degradability

Partially biodegradable.

12.3 Bioaccumulative potential

No data are available on the product itself.

Chemical Name	log Pow
METHYL METHACRYLATE	0.7
2-PROPENOIC ACID, 2-METHYL-	0.93

12.4 Mobility in soil

Mobility in soil

No information available.

Mobility

No data is available on the product itself.

12.5 Results of PBT and vPvB assessment

No information available.

12.6 Other adverse effects.

No information available.

13. Disposal Considerations

13.1 Waste treatment methods

Waste from residues / unused products	Dispose of as hazardous waste in compliance with local and national regulations. European Waste Catalogue. 080111 - waste paint and varnish containing organic solvents or other dangerous substances.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not burn, or use a cutting torch on, the empty drum. Waste Code. 150110 - packaging containing residues of or contaminated by dangerous substances.
Other information	European Waste Catalogue.

14. Transport Information

ADR

14.1 UN	1866
14.2 Proper shipping name	UN 1866 - Resin solution
14.3 Hazard class	3
ADR/RID-Labels	3
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable
14.6 Special Provisions	None
Tunnel restriction code	D/E
Hazard identification No	33

IMDG

14.1 UN	1866
14.2 Proper shipping name	UN 1866 - Resin solution
14.3 Hazard class	3
14.4 Packing Group	II
14.5 Marine pollutant	No
14.6 Special Provisions	None
EmS	F-E, S-E
14.7 Transport in bulk according to MARPOL 73/78 and the IBC Code	No information available

IATA

14.1 UN	1866
14.2 Proper shipping name	UN 1866 - Resin solution Resin Solution
14.3 Hazard class	3
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable

14.6 Special Provisions None

15. Regulatory information

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

National regulatory information

Germany WGK Classification WGK = 1 (self classification)

Germany GIS Code RMA 10

Denmark - MAL Factor MAL-kode 4-5

Chemical Name	French RG number	Title
METHYL METHACRYLATE 80-62-6	RG 65, RG 82	-
ETHYLENGLYCOL DIMETHACRYLATE 97-90-5	RG 65	-

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Authorisations and/or restrictions on use:

This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV)
This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

Persistent Organic Pollutants

Not applicable

International Inventories

TSCA Complies

EINECS/ELINCS Complies

DSL Complies

PICCS -

ENCS -

IECSC Complies

AICS -

KECL -

NZIoC -

Legend

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
AICS - Australian Inventory of Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

15.2 Chemical Safety Assessment

No information available

16. Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Full text of H-Statements referred to under section 3**

H319 - Causes serious eye irritation
H317 - May cause an allergic skin reaction
H411 - Toxic to aquatic life with long lasting effects
H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation
H315 - Causes skin irritation
H225 - Highly flammable liquid and vapour

Prepared By RPM Belgium
Regulatory Affairs/Product Safety

Revision Date 17-Sep-2021

Revision Note This data sheet contains changes from the previous version in section(s); 3, 8.

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

Disclaimer

The information provided on this SDS 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of Safety Data Sheet