SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name

TUFFSTUFF

RESIN

Product code

UFI: VV10-00UG-V000-YQ8N

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

Relevant identified uses

Resin for roofing. Contact the manufacturer for any other applications.

Uses advised against

No information.

1.3. Details of the supplier of the safety data sheet

Supplier

Tuff Waterproofing Ltd
Address: Unit 5, First Avenue, Sherburn in Elmet, LS25 6PD, United Kingdom
Phone: +44 (0)1977 680250
E-mail: info@tuffwaterproofing.co.uk

1.4. Emergency telephone number

Emergency

+44 (0) 1977 680250

Supplier

+44 (0)1977 680250 Mon-Friday 8.00am – 4.30pm

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

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

Flam. Liq. 3; H226 Flammable liquid and vapour.
Skin Irrit. 2; H315 Causes skin irritation.
Eye Irrit. 2; H319 Causes serious eye irritation.
STOT SE 3; H335 May cause respiratory irritation.
Repr. 2; H361d Suspected of damaging the unborn child.
STOT RE 1; H372 Causes damage to organs through prolonged or repeated inhalation
Aquatic Chronic 3; H412 Harmful to aquatic life with long lasting effects.

2.2 Label elements

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

Signal word: **Danger**

H226 Flammable liquid and vapour.
H315 Causes skin irritation.
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 inhalation
H412 Harmful to aquatic life with long lasting effects.
EUH208 Contains phthalic anhydride. May produce an allergic reaction.
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 vapours.
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.

2.2.2. Contains:

styrene (CAS: 100-42-5, EC: 202-851-5, Index: 601-026-00-0)

2.2.3. Special provisions

Special hazards are not known or expected.

2.3. Other hazards

No information.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

For mixtures see 3.2.

3.2. Mixtures

Name	CAS EC Index	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Conc. Limits	REACH Registration No.
styrene	100-42-5 202-851-5 601-026-00-0	cca. 37	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Acute Tox. 4; H332 STOT SE 3; H335 Repr. 2; H361d STOT RE 1; H372 Aquatic Chronic 3; H412		01-2119457861-32
silicon dioxide, amorphous	7631-86-9 231-545-4 -	> 1	not classified		01-2119379499-16
phthalic anhydride	85-44-9 201-607-5 607-009-00-4	<1	Acute Tox. 4; H302 Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Dam. 1; H318 Resp. Sens. 1; H334 STOT SE 3; H335		01-2119457017-41
2,2,4,6,6-pentamethylheptane	13475-82-6 236-757-0 -	cca. 0,3	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Aquatic Chronic 4; H413 EUH066		01-2119490725-29
Naphtha (petroleum), hydrodesulfurized heavy (benzene < 0.1 % w/w) *[P]*	64742-82-1 265-185-4 -	cca. 0,1	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 STOT SE 3; H336 STOT RE 1; H372 Aquatic Chronic 2; H411		01-2119490979-12

Notes for substances:

P	The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0,1 % w/w benzene (Einecs No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-)P260- P262-P301 + P310-P331 shall apply. This note applies only to certain complex oil-derived substances in Part 3.

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

General notes

When in doubt or if feeling unwell seek medical assistance. Show the safety data sheet and label to the physician. Do not breathe dust/fume/gas/mist/vapors/spray.
Use personal protective equipment. See section 8 for more information.

Following inhalation

Remove patient to fresh air - move out of dangerous area. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Obtain professional medical help!

Following skin contact

Take off all contaminated clothing. Wash affected skin areas thoroughly with plenty of water and soap. If symptoms develop and persist, seek medical attention.

Following eye contact

Immediately flush eyes with running water, keeping eyelids apart. If irritation persists, seek professional medical attention.

Following ingestion

Do not induce vomiting! Rinse mouth thoroughly with water. Consult a physician. Show the physician the safety data sheet or label. Never give anything by mouth to an unconscious person.

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

Inhalation

Coughing, sneezing, nasal discharge, labored breathing.
Can cause irritation of respiratory system.
Harmful.

Skin contact

Itching, redness, pain.

Eye contact

Redness, tearing, pain.

Ingestion

May cause abdominal discomfort.
May cause nausea/vomiting and diarrhea.
Irritates mucous membranes in the mouth, throat, esophagus and in gastrointestinal area.

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

-

SECTION 5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Alcohol-resistant foam.
Fire extinguishing powder.
Carbon dioxide (CO_2).

Unsuitable extinguishing media

Full water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

In case of a fire toxic gases can be generated; do not inhale gases/smoke.
Carbon monoxide (CO).

5.3. Advice for firefighters

Protective actions

In case of fire evacuate the area. In case of fire or heating do not breathe fumes/vapours. No action shall be taken involving any personal risk or without suitable training. Vapours are heavier than air and spread along floor. Vapours may form explosive mixtures with the air. Prolonged heating can cause an explosion. Cool containers at risk with water spray. If possible remove containers from endangered area.

Special protective equipment for firefighters

Firefighters should wear appropriate protective clothing for firefighters (including helmets, protective boots and gloves) (EN 469) and self-contained breathing apparatus (SCBA) with a full face-piece (EN 137).

Additional information

Contaminated firefighting water and fire residues must be disposed of in accordance with the local regulations.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment

Use personal protective equipment (Section 8).

Emergency procedures

Ensure adequate ventilation. Keep away from sources of ignition and/or heat; No smoking! Take precautionary measures against static discharges. Evacuate the danger zone. No action shall be taken involving any personal risk or without suitable training. Prevent access to unprotected personnel. Do not breathe vapour or mist. Avoid contact with skin, eyes and clothing. In the event of fire and/or explosion do not breathe fumes.

6.1.2. For emergency responders

Use personal protective equipment.

6.2. Environmental precautions

Do not allow product to reach water/drains/sewage systems or permeable soil. If accidental large entry into water or ground occurs, inform responsible authorities.

6.3. Methods and material for containment and cleaning up

6.3.1. For containment

Stem the spill if this does not pose risks.

6.3.2. For cleaning up

Prevent release into the sewer, water, basements or confined areas. Absorb product (with inert material), collect it in special container and dispose it to a licensed hazardous-waste disposal contractor. Make sure the leakage site is well aired. Use spark-proof tools. Dispose in accordance with applicable regulations (see Section 13).

6.3.3. Other information

See Section 12: ECOLOGICAL INFORMATION.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1. Protective measures

Measures to prevent fire

Ensure adequate ventilation. Take precautionary measures against static discharges. Ensure proper grounding of the equipment. Keep away from sources of ignition - no smoking. Use spark-proof tools. Vapours are heavier than air and spread along the floor. They form explosive mixtures with air. In order to avoid the risk of fires and explosions, never use compressed air when handling. Empty containers may contain flammable or explosive vapours.

Measures to prevent aerosol and dust generation

Use general or local exhaust ventilation to prevent inhaling vapours and aerosols.

Measures to protect the environment

Do not discharge into drains, surface water and soil. After use immediately close container tightly.

7.1.2. Advice on general occupational hygiene

Use good personal hygiene practices – wash hands at breaks and when done working with material. Do not eat, drink or smoke while working. Do not breathe vapours/mist. Avoid contact with skin, eyes and clothes. Remove contaminated clothes and wash them before reuse. Wear suitable protective equipment; see Section 8. In case of insufficient ventilation, wear suitable respiratory protection equipment. Avoid exposure - obtain special instructions before using. Refer to instructions on label and regulations for safety and health at work. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1. Technical measures and storage conditions

Store in accordance with local regulations. Keep in a cool, dry and well ventilated place. Store below 30°C. Keep away from heat and sources of ignition. Keep away from food, drink and animal feeding stuffs. Keep away from strong oxidising agents. Keep away from peroxides. Keep away from reducing agents.

7.2.2. Packaging materials

Metallic GRP containers.

7.2.3. Requirements for storage rooms and vessels

Close opened containers after use. Put the containers upright to prevent from leaking. Do not store in unlabelled containers. The empty containers contain the residues of the preparation and therefore can also pose a risk.

7.2.4. Storage class

-

7.2.5. Further information on storage conditions

-

7.3. Specific end use(s)

Recommendations

Roofing resin.

Industrial sector specific solutions

-

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Occupational exposure limit values

Name (CAS)	Limit values		Short-term exposure limit		Remarks	Biological Tolerance Values
	ml/m³ (ppm)	mg/m³	ml/m³ (ppm)	mg/m³		
Phthalic anhydride (85-44-9)		4		12	Sen	
Styrene (100-42-5)	100	430	250	1080		
styrene (100-42-5)	50	215	100	425	India; source: Ministry of Labour and Employment	

8.1.2. Information on monitoring procedures

BS EN 14042:2003 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. BS EN 482:2012+A1:2015 Workplace exposure. General requirements for the performance of procedures for the measurement of chemical agents. BS EN 689:2018 Workplace exposure. Measurement of exposure by inhalation to chemical agents. Strategy for testing compliance with occupational exposure limit values.

8.1.3. DNEL/DMEL values

For components

Name	Type	Exposure route	Exposure frequency	Value	Remark
styrene (100-42-5)	Worker	inhalation	long term (systemic effects)	85 mg/m^3	
styrene (100-42-5)	Worker	inhalation	short term (systemic effects)	289 mg/m^3	
styrene (100-42-5)	Worker	inhalation	short term (local effects)	306 mg/m^3	
styrene (100-42-5)	Worker	dermal	long term (systemic effects)	406 mg/kg bw/day	
styrene (100-42-5)	Consumer	inhalation	long term (systemic effects)	10,2 mg/m³	
styrene (100-42-5)	Consumer	inhalation	short term (systemic effects)	174,25 mg/m³	
styrene (100-42-5)	Consumer	inhalation	long term (local effects)	182,75 mg/m³	
styrene (100-42-5)	Consumer	dermal	long term (systemic effects)	343 mg/kg bw/day	
styrene (100-42-5)	Consumer	oral	long term (systemic effects)	2,1 mg/kg bw/day	

8.1.4. PNEC values

For components

Name	Exposure route	Value	Remark
styrene (100-42-5)	fresh water	0,028 mg/L	
styrene (100-42-5)	water, intermittent release	0,04 mg/L	fresh water
styrene (100-42-5)	marine water	0,014 mg/L	
styrene (100-42-5)	water treatment plant	5 mg/L	
styrene (100-42-5)	fresh water sediment	0,614 mg/kg	dry weight
styrene (100-42-5)	marine water sediment	0,307 mg/kg	dry weight
styrene (100-42-5)	soil	0,2 mg/kg	dry weight

8.2. Exposure controls

8.2.1. Appropriate engineering control

Substance/mixture related measures to prevent exposure during identified uses

Handle in accordance with good industrial hygiene and safety practice. Use good personal hygiene practices – wash hands at breaks and when done working with material. Do not breathe vapours/aerosols. Do not eat, drink or smoke while working. Avoid contact with skin, eyes and clothes. Appropriate technical measures to reduce exposure of workers must be chosen depending on the specific use of the product and the resulting risk of exposure at the workplace.

Organisational measures to prevent exposure

Remove all contaminated clothes immediately and wash them before reuse.

Technical measures to prevent exposure

Provide good ventilation and local exhaust in areas with increased concentration. Keep away from food, drink and animal feeding stuffs.

8.2.2. Personal protective equipment

Eye and face protection

Safety glasses with side protection (EN 166).

Hand protection

Protective gloves (EN 374). The penetration time is determined by the protective glove manufacturer and must be observed. Observe the manufacturer's instructions regarding the use, storage, maintenance and replacement of gloves. In case of damage or at the first signs of wear and tear, change the gloves immediately. The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Appropriate materials

Material	Thickness	Penetration Time	Remark
Neoprene			
Nitrile			
Viton (fluorinated rubber)			
PVA			

Skin protection

Protective antistatic clothing EN 1149 (1:2006, 2:1998 and 3:2004, 5:2008), protective antistatic shoes (EN 20345:2012). Wear fire/flame resistant/retardant clothing. EN ISO 11612:2015 - Protective clothing – Clothing to protect against heat and flame. Standard EN ISO 14116 - Limited flame spread materials

Respiratory protection

In case of insufficient ventilation wear suitable respiratory protection. Protective masks (EN 136) or half masks (EN 140) with filter A (EN 14387). In case of dust formation wear appropriate protective mask - mask with particle filter. Wear suitable protective breathing mask (EN 136) with filter A2-P2 (EN 14387).

Thermal hazards

-

8.2.3. Environmental exposure controls

Technical measures to prevent exposure

Do not allow product to reach drains, sewage systems or ground water.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

-	**Physical state:**	liquid
-	**Colour:**	green, blue, according to specification
-	**Odour:**	styren like

Important health, safety and environmental information

-	**pH**	No information.
-	**Melting point/freezing point**	No information.
-	**Initial boiling point/boiling range**	No information.
-	**Flash point**	31 °C
-	**Evaporation rate**	No information.
-	**Flammability (solid, gas)**	No information.
-	**Explosion limits (vol%)**	0,9 – 6,8 vol %
-	**Vapour pressure**	6 hPa at 20 °C
-	**Vapour density**	3,6
-	**Density**	**Density**: 1,11 – 1,15 g/cm^3 at 20 °C
-	**Solubility**	**Water**: Insoluble
-	**Partition coefficient**	No information.
-	**Auto-ignition temperature**	490 °C
-	**Decomposition temperature**	No information.
-	**Viscosity**	**kinematic**: 209 –245 mm^2/s at 25 °C **Dynamic**: 230 –270 mPas at 25 °C
-	**Explosive properties**	No information.
-	**Oxidising properties**	No information.

9.2. Other information

-	**Remarks:**	Soluble in most organic solvents. Solubility in other solvents: Medium Phthalates.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

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

10.2. Chemical stability

Product is stable under normal conditions of use, recommended handling and storage conditions.

10.3. Possibility of hazardous reactions

Vapours and air can form flammable or explosive mixtures. The risk of polymerization.

10.4. Conditions to avoid

Protect from heat, direct sunlight, open fire, sparks. Exposure to light. Take precautionary measures against static discharges.

10.5. Incompatible materials

Strong oxidising agents.
Peroxide. Reducing agents.

10.6. Hazardous decomposition products

Under normal use conditions no hazardous decomposition products are expected. In case of fire/explosion vapours/gases that pose a health hazard are released. Carbon dioxide; Carbon monoxide.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

(a) Acute toxicity

Name	Exposure route	Type	Species	Time	Value	Method	Remark
styrene (100-42-5)	oral	LD_{50}	rat		5000 mg/kg		
styrene (100-42-5)	dermal	LD_{50}	rat	24 h	> 2000 mg/kg bw	OECD 402	
styrene (100-42-5)	inhalation	LC_{50}	rat	4 h	11,8 mg/l		
silicon dioxide, amorphous (7631-86-9)	oral	LD_{50}	rat		> 5000 mg/kg bw	OECD 401	
silicon dioxide, amorphous (7631-86-9)	dermal	LD_{50}	rabbit		> 5000 mg/kg		
silicon dioxide, amorphous (7631-86-9)	inhalation	LC_{50}	rat	4 h	> 0,14 mg/l	OECD 403	
phthalic anhydride (85-44-9)	oral	LD_{50}	rat		1530 mg/kg bw		
phthalic anhydride (85-44-9)	dermal	LD_{50}	rabbit		> 3160 mg/kg bw		
phthalic anhydride (85-44-9)	inhalation	LC_{50}	rat	4 h	> 2,14 mg/l		
2,2,4,6,6-pentamethylheptane (13475-82-6)	oral	LD_{50}	rat		> 5000 mg/kg bw	OECD 401	
2,2,4,6,6-pentamethylheptane (13475-82-6)	dermal	LD_{50}	rabbit		≥ 3160 mg/kg bw		
2,2,4,6,6-pentamethylheptane (13475-82-6)	inhalation	LC_{50}	rat	4 h	> 4,95 mg/l	Equivalent to OECD 403	

(b) Skin corrosion/irritation

Name	Species	Time	Result	Method	Remark
styrene (100-42-5)	rabbit		Irritating.		
silicon dioxide, amorphous (7631-86-9)	rabbit		Non-irritant.	OECD 404	
phthalic anhydride (85-44-9)	rabbit		Irritating.	OECD 404	
2,2,4,6,6-pentamethylheptane (13475-82-6)	rabbit		Non-irritant.	Equivalent to OECD 404	
Additional information: Causes skin irritation.					

(c) Serious eye damage/irritation

Name	Species	Time	Result	Method	Remark
styrene (100-42-5)	rabbit		Irritating.		
silicon dioxide, amorphous (7631-86-9)	rabbit		No irritant effect.	OECD 405	
phthalic anhydride (85-44-9)	rabbit		Irritating to eyes.	Draize test	
2,2,4,6,6-pentamethylheptane (13475-82-6)	rabbit		No irritant effect.	OECD 405	
Additional information: Causes serious eye irritation.					

(d) Respiratory or skin sensitisation

Name	Exposure route	Species	Time	Result	Method	Remark
styrene (100-42-5)	dermal			Non sensitising.		
styrene (100-42-5)	inhalation			Non sensitising.		
silicon dioxide, amorphous (7631-86-9)	-			Non sensitising.		
phthalic anhydride (85-44-9)	dermal	guinea pig		Sensitizing.	OECD 406	
phthalic anhydride (85-44-9)	inhalation	guinea pig		Sensitizing.		
2,2,4,6,6-pentamethylheptane (13475-82-6)	dermal	guinea pig		Negative.	OECD 406	

Additional information: The product is not classified as sensitising. It contains at least one ingredient that can cause sensitisation. Can cause allergic reaction.

(e) (Germ cell) mutagenicity

Name	Type	Species	Time	Result	Method	Remark
styrene (100-42-5)	in-vitro mutagenicity	Salmonella typhimurium		Equivocal	OECD 471	
styrene (100-42-5)	in-vitro mutagenicity	Cell: Mammalian-Animal		Equivocal	OECD 476	
styrene (100-42-5)	in-vitro mutagenicity	mammalian cytogenetic test		Positive.	OECD 473, 479	Chromosome aberration assay
styrene (100-42-5)	in-vivo mutagenicity	mouse		Negative.	OECD 474, 486	
silicon dioxide, amorphous (7631-86-9)		Bacteria		Negative.	OECD 471 (Bacterial Reverse Mutation Test)	Ames test
silicon dioxide, amorphous (7631-86-9)	in-vitro mutagenicity	Cell: Mammalian-Animal		Negative.	OECD 476	
silicon dioxide, amorphous (7631-86-9)	in-vitro mutagenicity			Negative.	OECD 473	Chromosome aberration assay
silicon dioxide, amorphous (7631-86-9)	in-vivo mutagenicity	rat		Negative.		
phthalic anhydride (85-44-9)	in-vitro mutagenicity	Cell: Mammalian-Animal		Negative.	OECD 476	
phthalic anhydride (85-44-9)	in-vitro mutagenicity	Salmonella typhimurium		Negative.	OECD 471	
phthalic anhydride (85-44-9)	in-vitro mutagenicity	mammalian cytogenetic test		Equivocal	OECD 473	Chromosome aberration assay
2,2,4,6,6-pentamethylheptane (13475-82-6)	in-vitro mutagenicity	S. typhimurium, other: S. typhimurium TA1535, TA1537, TA98, TA100 and TA1538		Negative.	Equivalent to OECD 471	
2,2,4,6,6-pentamethylheptane (13475-82-6)	in-vitro mutagenicity	Mammalian cells - hamster		Negative.	Equivalent to OECD 476	
2,2,4,6,6-pentamethylheptane (13475-82-6)	in-vitro mutagenicity			Negative.	Equivalent to OECD 473	Chromosome aberration assay
2,2,4,6,6-pentamethylheptane (13475-82-6)	in-vivo mutagenicity	mouse		Negative.	Equivalent to OECD 474	

(f) Carcinogenicity

Name	Exposure route	Type	Species	Time	Value	Result	Method	Remark
styrene (100-42-5)	inhalation (vapours)	NOAEL	rat		≥ 4,34 mg/l	negative	OECD 453	
styrene (100-42-5)	inhalation (vapours)	NOAEC	mouse (male)		0,09 mg/l		OECD 453	
styrene (100-42-5)	inhalation (vapours)	LOAEC	mouse (male/female)		0,09 –0,18 mg/l	Positive	OECD 453	
styrene (100-42-5)	oral	NOAEL	rat		≥ 2000 mg/kg bw/day			
styrene (100-42-5)	oral	LOAEL	mouse		150 mg/kg bw/day	Positive		
silicon dioxide, amorphous (7631-86-9)	oral	NOAEL	rat		1800 - 32000 mg/kg bw/day	No effect	OECD 453	
phthalic anhydride (85-44-9)	oral	NOAEL	rat	105 weeks	1000 mg/kg bw/day	negative		
phthalic anhydride (85-44-9)	oral	NOAEL	mouse (male)	72 weeks	3570 mg/kg bw/day	negative		
phthalic anhydride (85-44-9)	oral	NOAEL	mouse (female)	72 weeks	1785 mg/kg bw/day	negative		

(g) Reproductive toxicity

Name	Reproductive toxicity type	Type	Species	Time	Value	Result	Method	Remark
styrene (100-42-5)	Maternal toxicity + developmental toxicity	NOAEC/LOAEC	rat	50 days	1,08 –2,15 mg/L	Positive.		Inhalation
styrene (100-42-5)	Maternal toxicity	LOAEC	rat		1,28 mg/L	Positive.	OECD 414	6-15 days; inhalation
styrene (100-42-5)	Developmental toxicity	NOAEC	rat		≥ 2,56 mg/L	Negative.	OECD 414	6-15 days; inhalation
styrene (100-42-5)	Maternal toxicity + developmental toxicity	NOAEC	rabbit		2,56 mg/L	Negative.	OECD	6-18 days; inhalation
styrene (100-42-5)	Effects on fertility	NOAEL/LOAEL	rat	60 days	100 – 200 mg/kg bw/day	Positive.		Inhalation
styrene (100-42-5)	Effects on fertility	NOAEL/LOAEL	rat	60 days	200 – 400 mg/kg bw/day	Positive.	OECD 422	oral
styrene (100-42-5)	Reproductive toxicity	NOAEC (P/F1)	rat		0 mg/L		two-generation study; OECD 416	Inhalation
styrene (100-42-5)	Reproductive toxicity	LOAEC (P, F1)	rat		2,13 mg/L		two-generation study; OECD 416	Inhalation
styrene (100-42-5)	Reproductive toxicity	NOAEC (F2)	rat		0,21 mg/L		two-generation study; OECD 416	Inhalation

styrene (100-42-5)	Reproductive toxicity	LOAEC (F2)	rat	70 days	0,64 mg/L		two-generation study; OECD 416	Inhalation
silicon dioxide, amorphous (7631-86-9)	Effects on fertility	NOAEL	rat		497 mg/kg bw/day	Negative.	OECD 415	oral
silicon dioxide, amorphous (7631-86-9)	Maternal toxicity	NOAEL	rat		1350 mg/kg bw/day		OECD 414	oral
phthalic anhydride (85-44-9)	Reproductive toxicity	NOAEL	mouse (male)	72 weeks	3570 mg/kg bw/day	Negative.		oral
phthalic anhydride (85-44-9)	Reproductive toxicity	NOAEL	mouse (female)	72 weeks	1785 mg/kg bw/day	Negative.		oral
phthalic anhydride (85-44-9)	Reproductive toxicity	NOAEL	rat (female)	105 weeks	1000 mg/kg bw/day			oral
phthalic anhydride (85-44-9)	Maternal toxicity	NOAEL	rat		1000 mg/kg bw/day			oral
phthalic anhydride (85-44-9)	Teratogenicity	NOAEL	rat		1700 mg/kg bw/day			oral
2,2,4,6,6-pentamethylheptane (13475-82-6)	oral	NOAEL	rat		≥ 1000 mg/kg bw/day	Negative.	Equivalent to OECD 422	P/F1
2,2,4,6,6-pentamethylheptane (13475-82-6)	Developmental toxicity	NOAEL	rat (female)	15 days	≥ 5220 mg/m³	Negative.	Equivalent to OECD 414	

Summary of evaluation of the CMR properties

Suspected of damaging the unborn child.

(h) STOT-single exposure

Name	Exposure route	Type	Species	Time	Organ	Value	Result	Method	Remark
phthalic anhydride (85-44-9)	inhalation	-					May cause respiratory irritation.		
Additional information: May cause respiratory irritation.									

(i) STOT-repeated exposure

Name	Exposure route	Type	Species	Time	Organ	Value	Result	Method	Remark
styrene (100-42-5)	inhalation	-	rat (male)	28 days	Central nervous system, hearing organs	3,47 mg/L	Causes damage to organs through prolonged or repeated exposure.		
styrene (100-42-5)	inhalation	NOAEC		28 days		2,13 mg/L			ototoxicity
styrene (100-42-5)	inhalation	NOAEC	mouse	28 days		0,181 mg/L		OECD 412	
styrene (100-42-5)	inhalation	NOAEC	rat	28 days		0,688 mg/L		OECD 412	
styrene (100-42-5)	inhalation	NOAEC	rat	90 days	nose	0,85 mg/L			
styrene (100-42-5)	inhalation	NOAEC	rat	90 days	overall	2,13 mg/L			

styrene (100-42-5)	oral	NOAEL	rat			1000 mg/kg bw/day			
styrene (100-42-5)	oral	LOAEL	rat			2000 mg/kg bw/day			
styrene (100-42-5)	oral	NOAEL	mouse			150 mg/kg bw/day			
styrene (100-42-5)	oral	LOAEL	mouse			300 mg/kg bw/day			
styrene (100-42-5)	inhalation	LOAEC	rat			0,21 mg/L		OECD 453	
silicon dioxide, amorphous (7631-86-9)	oral	NOEL	rat	90 days		4000 – 4500 mg/kg/day		OECD 408	
silicon dioxide, amorphous (7631-86-9)	inhalation	NOEC	rat	90 days		1,3 mg/m^3		OECD 413	
silicon dioxide, amorphous (7631-86-9)	dermal	NOAEL	rabbit			≥ 1000 mg/kg bw/day			
phthalic anhydride (85-44-9)	oral	NOAEL	rat	7 weeks		1250 mg/kg bw/day			
phthalic anhydride (85-44-9)	oral	LOAEL	rat	7 weeks		2500 mg/kg bw/day			
phthalic anhydride (85-44-9)	oral	NOAEL	rat	105 weeks		500 mg/kg bw/day			
phthalic anhydride (85-44-9)	oral	LOAEL	mouse (male/female)	72 weeks		1717 – 2340 mg/kg bw/day			
2,2,4,6,6-pentamethylheptane (13475-82-6)	inhalation	NOAEC	mouse	17 days		≥ 400 ppm		Equivalent to OECD 412	
2,2,4,6,6-pentamethylheptane (13475-82-6)	oral	NOAEL	rat	13 weeks		≥ 1000 mg/kg		Equivalent to OECD 408	
2,2,4,6,6-pentamethylheptane (13475-82-6)	inhalation	NOAEL	rat	13 weeks		≥ 1,16 mg/m^3		OECD 413	
2,2,4,6,6-pentamethylheptane (13475-82-6)	inhalation	NOAEC	rat	105 weeks		≥ 400 ppm			
2,2,4,6,6-pentamethylheptane (13475-82-6)	inhalation	NOAEC	rat	105 weeks		25 ppm		Equivalent to OECD 453	

Additional information: Causes damage to organs through prolonged or repeated exposure.

(j) Aspiration hazard

Additional information: Aspiration hazard: Not classified.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

12.1.1. Acute (short-term) toxicity

For components

Substance (CAS Nr.)	Type	Value	Exposure time	Species	Organism	Method	Remark
styrene (100-42-5)	LC_{50}	4,9 mg/L	72 h	algae	*Pseudokirchneriella subcapitata*	EPA OTS 797.1050	
	EC_{50}	4,7 mg/L	48 h	crustacea	*Daphnia magna*	OECD 202	
	NOEC	1,9 mg/L	48 h	crustacea	*Daphnia magna*	OECD 202	
	EC_{50}	500 mg/L	30 min	activated sludge		OECD 209	
	LC_{50}	4,02 mg/L	96 h	fish	*Pimephales promelas*	OECD 203	
silicon dioxide, amorphous (7631-86-9)	EL_{50}	≥ 1000 mg/L	24 h	crustacea	*Daphnia magna*	OECD 202	
	LC_{50}	> 10000 mg/L	96 h	fish	*Danio rerio*	OECD 203	
phthalic anhydride (85-44-9)	EC_{50}	68 mg/L	72 h	algae	*Pseudokirchneriella subcapitata*	OECD 201	
	NOEC	32 mg/L	72 h	algae	*Pseudokirchneriella subcapitata*	OECD 201	
	EC_{50}	71 mg/L	48 h	crustacea	*Daphnia magna*	OECD 202	
	LC_{50}	> 99 mg/L	96 h	fish	*Oryzias latipes*	OECD 203	
	EC_{50}	> 1000 mg/L	3 h	microorganisms	Activated sludge	ISO 8192	
	EC_{50}	13 mg/L	16 h	microorganisms	*Pseudomonas putida*	ISO 10712	
	EC_{50}	731 mg/L		Plants	*Lactuca sativa*		
2,2,4,6,6-pentamethylheptane (13475-82-6)	EC_{50}	> 22,5 mg/L	72 h	algae	*Desmodesmus subspicatus*	OECD 201	
	EC_{50}	> 1,3 mg/L	48 h	crustacea	*Daphnia magna*	ASTM E729-88	
	LC_{50}	> 2,8 mg/L	96 h	fish	*Danio rerio*	OECD 203	

12.1.2. Chronic (long-term) toxicity

For components

Substance (CAS Nr.)	Type	Value	Exposure time	Species	Organism	Method	Remark
styrene (100-42-5)	NOEC	1,01 mg/l	21 days	crustacea	*Daphnia magna*	OECD 211	
	LOEC	2,06 mg/l	21 days	crustacea	*Daphnia magna*		
	EC50	1,88 mg/l	21 days	crustacea	*Daphnia magna*	OECD 203	
	LC_{50}	120 mg/kg soil dw	14 days	earthworms	*Eisenia fetida*	OECD 207	
	LOEC	65 mg/kg soil dw		earthworms	*Eisenia fetida*	OECD 207	burrowing time and mean percent weight change
	LOEC	180 mg/kg soil dw		earthworms	*Eisenia fetida*	OECD 207	survival
	NOEC	34 mg/kg soil dw		earthworms	*Eisenia fetida*	OECD 207	mean percent weight change
phthalic anhydride (85-44-9)	NOEC	16 mg/l	21 days	crustacea	*Daphnia magna*	OECD 211	
	EC50	42 mg/l	21 days	crustacea	*Daphnia magna*	OECD 211	
	LC_{50}	560 mg/l	7 days	fish	*Danio rerio*	OECD 210	
	LOEC	32 mg/l	60 days	fish			
	NOEC	10 mg/l	60 days	fish		OECD 210	
2,2,4,6,6-pentamethylheptane (13475-82-6)	NOEC	0,013 mg/l	21 days	crustacea	*Daphnia magna*	OECD 211	
	NOELR	0,267 mg/l	28 days	fish	*Oncorhynchus mykiss*	QSAR	

12.2. Persistence and degradability

12.2.1. Abiotic degradation, physical- and photo-chemical elimination

No information.

12.2.2. Biodegradation

For components

Substance (CAS Nr.)	Type	Rate	Time	Evaluation	Method	Remark
styrene (100-42-5)	biodegradability	87 %	20 days	readily biodegradable	OECD 301 D	
phthalic anhydride (85-44-9)	biodegradability	68 %	10 days	readily biodegradable	OECD 301 D	
phthalic anhydride (85-44-9)	biodegradability	74 %	30 days	readily biodegradable	OECD 301 D	
2,2,4,6,6-pentamethylheptane (13475-82-6)	biodegradability	14	31 days	Not inherently degradable	EPA OTS 796.3100	

12.3. Bioaccumulative potential

12.3.1. Partition coefficient

For components

Substance (CAS Nr.)	Media	Value	Temperature	pH	Concentration	Method
styrene (100-42-5)	Octanol-water (log Pow)	3				
phthalic anhydride (85-44-9)	Octanol-water (log Pow)	1,6				

12.3.2. Bioconcentration factor (BCF)

For components

Substance (CAS Nr.)	species	Organism	Value	Duration	Evaluation	Method	Remark
styrene (100-42-5)	BCF		74				Calculated value

12.4. Mobility in soil

12.4.1. Known or predicted distribution to environmental compartments

No information.

12.4.2. Surface tension

No information.

12.4.3. Adsorption/Desorption

For components

Substance (CAS Nr.)	Type	Criterion	Value	Evaluation	Method	Remark
styrene (100-42-5)	Soil		352			Koc
styrene (100-42-5)	Soil	log KOC	2,55			
phthalic anhydride (85-44-9)	Soil		31			Koc

12.5. Results of PBT and vPvB assessment

No evaluation.

12.6. Other adverse effects

No specific effects or critical hazards known.

12.7. Additional information

For product

Harmful to aquatic life with long lasting effects.
Do not allow to reach ground water, water courses or sewage system.

For components

Substance: styrene

This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

Substance: silicon dioxide, amorphous

This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

Substance: phthalic anhydride

This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

Substance: 2,2,4,6,6-pentamethylheptane

This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

13.1.1. Product / Packaging disposal

Waste chemical

Dispose of in accordance with applicable waste disposal regulation. Disposal must be made according to official regulations: deliver it to authorised collector/remover/transformer of hazardous waste. Do not allow product to reach drains/sewage systems.

Packaging

Dispose of in accordance with applicable waste disposal regulation. Uncleaned containers are classified as hazardous waste - they should be handled in the same manner as the contents. Deliver completely emptied containers to approved waste disposal authorities. Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Uncleaned containers should not be perforated, cut or welded.

13.1.2. Waste treatment-relevant information

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13.1.3. Sewage disposal-relevant information

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13.1.4. Other disposal recommendations

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SECTION 14. TRANSPORT INFORMATION

14.1. UN number

UN 1866

14.2. UN proper shipping name

RESIN SOLUTION

14.3. Transport hazard class(es)

3

14.4. Packing group

III

14.5. Environmental hazards

NO.

14.6. Special precautions for user

Limited quantities

5 L

Tunnel restriction code

(D/E)

IMDG flashpoint

31 °C, c.c.

IMDG EmS

F-E, S-E

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Goods may not be carried in bulk in bulk containers, containers or vehicles.

SECTION 15. REGULATORY INFORMATION

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

- Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (including last amendment Commission Regulation (EU) 2015/830)

- Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

15.1.1. Information according 2004/42/EC about limitation of emissions of volatile organic compounds (VOC-guideline)

Not applicable.

15.1.2. Special instructions

Observe the regulations on employment and protection against dangerous substances for young people, pregnant women and nursing mothers.

15.2. Chemical Safety Assessment

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

SECTION 16. OTHER INFORMATION

Indication of changes

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Abbreviations and acronyms

ATE - Acute Toxicity Estimate
ADR - Agreement concerning the International Carriage of Dangerous Goods by Road
ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CEN - European Committee for Standardisation
C&L - Classification and Labelling
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CAS# - Chemical Abstracts Service number
CMR - Carcinogen, Mutagen, or Reproductive Toxicant
CSA - Chemical Safety Assessment
CSR - Chemical Safety Report
DMEL - Derived Minimal Effect Level
DNEL - Derived No Effect Level
DPD - Dangerous Preparations Directive 1999/45/EC
DSD - Dangerous Substances Directive 67/548/EEC
DU - Downstream User
EC - European Community
ECHA - European Chemicals Agency
EC-Number - EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA - European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC - European Economic Community
EINECS - European Inventory of Existing Commercial Substances
ELINCS - European List of notified Chemical Substances
EN - European Standard
EQS - Environmental Quality Standard
EU - European Union
Euphrac - European Phrase Catalogue
EWC - European Waste Catalogue (replaced by LoW – see below)
GES - Generic Exposure Scenario
GHS - Globally Harmonized System
IATA - International Air Transport Association
ICAO-TI - Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG - International Maritime Dangerous Goods
IMSBC - International Maritime Solid Bulk Cargoes
IT - Information Technology
IUCLID - International Uniform Chemical Information Database
IUPAC - International Union for Pure Applied Chemistry
JRC - Joint Research Centre
Kow - octanol-water partition coefficient
LC_{50} - Lethal Concentration to 50 % of a test population
LD_{50} - Lethal Dose to 50% of a test population (Median Lethal Dose)
LE - Legal Entity
LoW - List of Wastes (see http://ec.europa.eu/environment/waste/framework/list.htm)
LR - Lead Registrant
M/I - Manufacturer / Importer

MS - Member States
MSDS - Material Safety Data Sheet
OC - Operational Conditions
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit
OJ - Official Journal
OR - Only Representative
OSHA - European Agency for Safety and Health at work
PBT - Persistent, Bioaccumulative and Toxic substance
PEC - Predicted Effect Concentration
PNEC(s) - Predicted No Effect Concentration(s)
PPE - Personal Protection Equipment
(Q)SAR - Qualitative Structure Activity Relationship
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
RIP - REACH Implementation Project -
Risk Management Measure
SCBA - Self-Contained Breathing Apparatus
SDS - Safety data sheet
SIEF - Substance Information Exchange Forum
SME - Small and Medium sized Enterprises
STOT - Specific Target Organ Toxicity
(STOT) RE - Repeated Exposure
(STOT) SE - Single Exposure
SVHC - Substances of Very High Concern
UN - United Nations
vPvB - Very Persistent and Very Bioaccumulative

Key literature references and sources for data

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List of relevant H phrases

H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H361d Suspected of damaging the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure .
H411 Toxic to aquatic life with long lasting effects.
H412 Harmful to aquatic life with long lasting effects.
H413 May cause long lasting harmful effects to aquatic life.
EUH066 Repeated exposure may cause skin dryness or cracking.

The information of this SDS is based on the present state of our knowledge and meets the requirements of EU and national laws. The user's working conditions however, are beyond our knowledge and control. The product is not to be used for purposes other than those specified under Section 1 without a written permission. It remains the responsibility of the user to ensure that the necessary steps are taken to meet the laws and regulations. Handling of the product may only be done by people above 18 years of age, who are satisfactorily informed of how to do the work, the hazardous properties and necessary safety precautions. The information given in this SDS is to describe the product only in terms of health and safety requirements and should not, therefore, be construed as guaranteeing specific properties.