RESIN VINYLESTER

Product Name:	**Resin Vinylester** **1570444 Rev. 0**
Revision Date:	24-Oct-2023 **According to Regulation (EC) No. 1907/2006**

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

1.1. Product Identifier

Product Name: Resin Vinylester

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

Use: Resins system used in the production of fibre reinforced plastics or non-reinforced filled products.

Uses advised against: Consumer use

1.3. Details of the supplier of the safety data sheet

Tricel Composites (GB) Limited

Unit A, Foxway,
Off Atkinson Street,
Leeds, West Yorkshire,
LS10 1PS.
Tel: +44 (0)113 270 3133

Tricel Composites (NI) Limited

Unit 4, Milltown Ind. Estate, Greenan Road. Warrenpoint, Newry
Co. Down,
BT34 3FN.
Tel: +44 (0)284 175 3738

1.4. Emergency Telephone Number

Emergency medical information: 8am-10pm (seven days) contact National Poisons Information Centre, Beaumont Hospital, Dublin 9 DOV2NO, Ireland.
Telephone Number: +353 (0)1 809 2166

Leeds:	**Newry:**
Tel: +44 (0)113 270 3133	Tel: +44 (0)284 175 3738

1.4.1. 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)

2. Hazards Identification

2.1. Classification of the substance or mixture

- Flammable liquids, Category 3 (H226)
- Skin irritation, Category 2 (H315)
- Eye irritation, Category 2 (H319)
- Reproductive toxicity, Category 2 (H361d)
- Specific target organ toxicity (single exposure), Category 3 (H335 (Respiratory system))
- Specific target organ toxicity (repeated exposure), Category 1 (H372)
- Chronically hazardous to the aquatic environment, Category 3 (H412)

2.2. Label elements

GHS02 GHS08 GHS07

Signal Word: Danger

Hazardous components which must be listed on the label: Styrene

2.2.1. Hazard Statements

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 exposure.

H412 Harmful to aquatic life with long lasting effects.

2.2.2. Precautionary Statements

P201 Obtain special instructions before use.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P403 + P235 Store in a well-ventilated place. Keep cool.

2.2.3. Supplementary hazardous characteristics and labeling elements:

Contains:
Methacrylic acid, monoester with propane-1,2-diol EUH208 May produce an allergic reaction.

2.3. Other Hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

3. Composition/Information on Ingredients

Type of product: Mixture

3.1. Substances

Not applicable

3.2. Mixtures

Hazardous components

styrene
Concentration [wt.-%]: >= 25 - < 50
Index-No.: 601-026-00-0
EC-No.: 202-851-5
CAS-No.: 100-42-5
Classification (1272/2008/CE): Flam. Liq. 3 H226 Acute Tox. 4 Inhalative H332 Skin Irrit. 2 H315 Eye Irrit.
2 H319 Repr. 2 H361d STOT SE 3 H335 (Respiratory system) STOT RE 1 Inhalative H372 (auditory system) Asp. Tox. 1 H304 Aquatic Chronic 3 H412
ATE (inhalation, vapour): 11.8 mg/l

Methacrylic acid, monoester with propane-1,2-diol
Concentration [wt.-%]: >= 0.3 - < 1
EC-No.: 248-666-3
CAS-No.: 27813-02-1
Classification (1272/2008/CE): Eye Irrit. 2 H319 Skin Sens. 1 H317

1,4-dihydroxybenzene; hydroquinone; quinol
Concentration [wt.-%]: >= 0.0025 - < 0.025
Index-No.: 604-005-00-4

EC-No.: 204-617-8

CAS-No.: 123-31-9

Classification (1272/2008/CE): Acute Tox. 4 Oral H302 Eye Dam. 1 H318 Skin Sens. 1 H317 Muta. 2 H341 Carc. 2 H351 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

M-factor (acute aquat. tox.): 10

M-factor (chron. aquat. tox.): 1

ATE (oral): 500 mg/kg

4. First Aid Measures

4.1. Description of First Aid Measures

General advice: Take off all contaminated clothing immediately.

For effective first-aid, special training / education is needed.

If inhaled: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required. If breathing is irregular or stopped, administer artificial respiration. If unconscious, place in recovery position and seek medical advice. Consult a physician if necessary. In the case of hazardous fumes, wear self contained breathing apparatus. Inhalation may provoke the following symptoms: respiratory tract irritation coughing

In case of skin contact: In case of skin contact wash affected areas thoroughly with soap and plenty of water. Obtain medical attention. Remove contaminated clothing and shoes. Thoroughly clean shoes before reuse. Wash clothing before reuse. Most important symptoms Redness Skin irritation

In case of eye contact: Immediately flush eye(s) with plenty of water. Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist. Remove contact lenses. Eye

contact may provoke the following symptoms eye redness irritant effects In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed: DO NOT induce vomiting. Wash/clean mouth with water. Medical advice is required. If a person vomits when lying on his back, place him in the recovery position. If symptoms persist, call a physician. Wash mouth out with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. If conscious, make the victim drink the following: Give small amounts of water to drink.

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

Notes to physician: Treat symptomatically. Basic first aid, decontamination, symptomatic treatment. Allergic symptoms may develop within 12 hours after exposure. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. corrosive effects

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

Therapeutic measures: No information available.

5. Firefighting Measures

5.1. Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2), Foam, extinguishing powder, Water spray

Unsuitable extinguishing media: High volume water jet

5.2. Special Hazards arising from substance or mixture

Flammable Liquid. Vapors may spread long distances and ignite. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Cool endangered vessels and containers with sprayed water. Heating raises pressure with consequent risk of bursting and explosion. The vapors are heavier than air and creep at ground level. If they are ignited, the flame may cover large distances. In the event of fire and/or explosion do not breathe fumes. Formation of carbon monoxide, carbon dioxide and other toxic gases in the event of fire or during thermal decomposition. Fire will produce dense black smoke containing hazardous combustion products (see section 10). In case of fire, may produce hazardous decomposition products such as: Aldehydes Organic acids

5.3. Advice for Firefighters

Use personal protective equipment. Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Immediately evacuate personnel to safe areas. Put on protective equipment (see section 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Keep away from sources of ignition. Remove all sources of ignition. Wear respiratory protection.

6.2. Environmental Related Precautions

In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Do not allow to escape into waterways, wastewater or soil. Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains.

6.3. Methods and Material for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Dilute with water. Use explosion-proof equipment.

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).

Dispose of wastes in an approved waste disposal facility.

Do not discharge large quantities of concentrated spills or residues into surface water or sanitary sewer system.

6.4. Reference to other sections

Do not breathe vapours/dust. Use only in an area containing flame proof equipment. Use only in an area containing explosion proof equipment.

For personal protection see section 8. For further disposal measures see section 13.

7. Handling and Storage

7.1. Precautions for safe handling

For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Wash skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. Avoid contact with the skin and the eyes. When handling observe the usual precautionary measures for chemicals. Do not re-use empty containers. Do not use sparking tools. Use explosion-proof electrical, ventilating and lighting equipment. Take precautionary measures against static discharges. Avoid exposure - obtain special instructions before use. Do not breathe vapours or spray mist. Do not ingest. Do not use in areas without adequate ventilation. Ensure adequate ventilation. Keep only in original packaging. Do not enter areas where used or stored until adequately ventilated. Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking. Ensure proper ventilation and extraction, including at floor level. Avoid contact during pregnancy and while nursing.

Keep away from foodstuffs, drinks and tobacco. Wash hands and face before breaks and at the end of work. Keep working clothes separately. Change contaminated or soaked clothing immediately.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Store in original container. Protect against heat and direct sunlight. Keep in properly labelled containers. Use appropriate container to avoid environmental contamination. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet. Store locked up. Keep away from oxidizing agents.

7.3. Specific end use(s)

Resins system used in the production of fibre reinforced plastics or non-reinforced filled products.

8. Exposure Controls/Personal Protection

UK Workplace Exposure Limits (WEL), per EH40 document (Health & Safety Executive). If no UK value exists, EU exposure limits given where available.

8.1. Control Parameters

Components with workplace control parameters

Substance	CAS-No.	Basis	Type	Value	Ceiling Limit Value	Remarks
styrene	100-42-5	EH40 WEL	STEL	250 ppm 1,080 mg/m3	15 MIN	
styrene	100-42-5	EH40 WEL	TWA	100 ppm 430 mg/m3		
Silicon dioxide	7631-86-9	EH40 WEL	TWA	6 mg/m3		
Silicon dioxide	7631-86-9	EH40 WEL	TWA	2.4 mg/m3		
1,4-dihydroxybenzene; hydroquinone; quinol	123-31-9	EH40 WEL	TWA	0.5 mg/m3		

8.2. Exposure Controls

Appropriate engineering controls

Use explosion-proof electrical, ventilating and lighting equipment.Use a local and/or general ventilation system.Use feasible engineering controls to minimize exposure to compound.Ensure adequate ventilation.Use process enclosures, local exhaust ventilation or other engineering controls to keep concentrations below lower explosive limits.

Respiratory protection

Respiratory equipment with gas filter A (identifying colour brown) is recommended. Respiratory protection required in insufficiently ventilated working areas.

Hand protection

Conditionally suitable materials for protective gloves; EN 374:
Viton: thickness >=0,7mm; Break through time: 240 - 480 min Contaminated and/or damaged gloves must be changed.

Nitrile rubber: thickness >=0,4mm; Break through time: < 60 min
Contaminated and/or damaged gloves must be changed.

Eye protection

Safety glasses with side-shields Ensure that eyewash stations and safety showers are close to the workstation location.

Skin and body protection

Wear suitable protective clothing and if necessary full protective suit. Use appropriate degowning techniques to remove potentially contaminated clothing.

Further protective measures

Wear suitable protective equipment. When using do not eat, drink or smoke. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash it before reuse. Wash face, hands and any exposed skin thoroughly after handling. Use appropriate degowning techniques to remove potentially contaminated clothing.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical state:	liquid at 20 °C at 1,013 hPa
Colour:	purple
Odour:	characteristic
Odour Threshold:	0.15 - 25 ppm
pH:	7 at 0.02 %
Melting point/range:	< 25 °C

Boiling point/boiling range:	145 °C
Flash point:	33 °C, closed cup
Evaporation rate:	12.4(Butyl Acetate=1.0)
Flammability:	not established
Burning number:	not established
Upper/lower flammability or explosive limits:	upper: 6.1 %(V) / lower: 1.1 %(V)
Vapour pressure:	6.7 hPa at 20 °C
Relative vapour density:	3.6 (Air = 1.0)
Density:	0.9 - 1.2 g/cm³ at 23 °C
Bulk density:	1,050 kg/m³ at 23 °C
Miscibility with water:	immiscible
Water solubility:	< 0.02 g/l
Surface tension:	not established
Partition coefficient (n-octanol/water):	not established
Auto-ignition temperature:	490 °C
Ignition temperature:	not established
Decomposition temperature:	not established
Heat of combustion:	not established
Viscosity, dynamic:	500 - 600 mPa.s at 25 °C
Viscosity, kinematic:	> 20.5 mm2/s at 40 °C > 416 mm2/s at 20 °C

9.2. Other Information

The indicated values do not necessarily correspond to the product specification.

Please refer to the technical information sheet for specification data.

Explosive properties: not established

Dust explosion class: not established

Oxidising properties: not applicable

10. Stability and Reactivity

10.1. Reactivity

This information is not available.

10.2. Chemical stability

Not applicable.

10.3. Possibility of hazardous reactions

No hazardous reactions when stored and handled correctly. Stable under normal conditions.

10.4. Conditions to avoid

Keep away from heat and sources of ignition. Electrical spark Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Electrostatic discharge

10.5. Incompatible materials

Strong acids , Oxidizing agents

10.6. Hazardous decomposition Products

This information is not available.

11. Toxicological Information

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

Acute toxicity, oral

styrene

LD50 rat, male/female: ca. 5,000 mg/kg

Methacrylic acid, monoester with propane-1,2-diol

LD50 rat, male/female: > 2,000 mg/kg

1,4-dihydroxybenzene; hydroquinone; quinol

LD50 rat, male/female: > 375 mg/kg

Assessment: Harmful if swallowed.

Method: OECD Test Guideline 401

Acute toxicity, dermal

styrene

LD50 rat, male/female: > 2,000 mg/kg

Method: OECD Test Guideline 402

Methacrylic acid, monoester with propane-1,2-diol

LD50 rabbit, male: > 5,000 mg/kg

1,4-dihydroxybenzene; hydroquinone; quinol

LD50 rabbit, male/female: > 2,000 mg/kg

Method: OECD Test Guideline 402

Acute toxicity, inhalation

ATEmix (inhal.): > 20 mg/l, 4 h

Test atmosphere: vapour

Method: Calculation method

styrene

LC50 rat: 11.8 mg/l, 4 h

Test atmosphere: vapour

Methacrylic acid, monoester with propane-1,2-diol

Assessment: no data available

Not a relevant route of exposure

1,4-dihydroxybenzene; hydroquinone; quinol

Assessment: no data available

Primary skin irritation

styrene

Species: rabbit

Result: irritating

Classification: Causes skin irritation.

Methacrylic acid, monoester with propane-1,2-diol

Species: rabbit

Result: non-irritant

Classification: No skin irritation

1,4-dihydroxybenzene; hydroquinone; quinol

Species: rabbit

Result: non-irritant

Classification: No skin irritation

Primary mucosae irritation

styrene

Species: rabbit

Result: irritating

Classification: Causes serious eye irritation.

Methacrylic acid, monoester with propane-1,2-diol

Species: rabbit

Result: irritating

Classification: Causes serious eye irritation.

1,4-dihydroxybenzene; hydroquinone; quinol

Result: severe irritant

Classification: Causes serious eye damage.

Suppliers' information

Sensitisation

styrene

Skin sensitisation:

Result: negative

Classification: Does not cause skin sensitization.

Respiratory sensitization

Classification: Does not cause respiratory sensitization.

Methacrylic acid, monoester with propane-1,2-diol

Skin sensitisation:

Result: positive

Classification: May cause sensitization by skin contact.

Method: Expert judgement

Respiratory sensitization no data available

1,4-dihydroxybenzene; hydroquinone; quinol

Skin sensitisation:

Species: Guinea pig

Result: positive

Classification: May cause sensitization by skin contact.

Method: OECD Test Guideline 406

Subacute, subchronic and prolonged toxicity

styrene

NOAEL: 0.8 mg/l

Application Route: Inhalative

Species: rat, male/female

Dose Levels: 0 - 0,21 - 0,8 - 2,2 - 4,3 mg/l

Exposure duration: 2 Years

Frequency of treatment: 6 hours a day, 5 days a week

Test substance: vapour

Method: OECD Test Guideline 453

NOAEL: 0.85 mg/l

Application Route: Inhalative

Species: rat, male

Dose Levels: 0 - 0,21 - 0,85 - 3,41 mg/l

Exposure duration: 13 Weeks

Frequency of treatment: 6 hours a day, 5 days a week

Target Organs: auditory system

Test substance: vapour

Methacrylic acid, monoester with propane-1,2-diol
NOAEL: 300 mg/kg
Application Route: Oral
Species: rat, male/female
Dose Levels: 0 - 30 - 100 - 300 - 1000 mg/kg bw/day
Frequency of treatment: daily
Method: OECD Test Guideline 422

1,4-dihydroxybenzene; hydroquinone; quinol
NOAEL: 25 mg/kg
LOAEL (Lowest observable adverse effect level): 50 mg/kg
Application Route: Oral
Species: rat, male
Dose Levels: 25 - 50 mg/kg bw/day
Exposure duration: 104 Weeks Frequency of treatment: 5 days/week
Method: OECD Test Guideline 453

LOAEL (Lowest observable adverse effect level): 25 mg/kg
Application Route: Oral
Species: rat, female
Dose Levels: 25 - 50 mg/kg bw/day
Exposure duration: 104 Weeks
Frequency of treatment: 5 days/week
Method: OECD Test Guideline 453

Carcinogenicity

styrene
Species: rat, male/female
Application Route: Inhalative
Dose Levels: 0 - 0,21 - 0,83 - 2,16 - 4,34 mg/l

Test substance: vapour

Exposure duration: 2 year(s)

Frequency of treatment: 6 hours/day, 5 days/week

Method: OECD Test Guideline 453

No increase in the incidence of tumors.

Methacrylic acid, monoester with propane-1,2-diol

NOAEL (Toxicity): >= 2.05 mg/l

LOAEL (Toxicity): ca. 1.03 mg/l

Species: rat, male/female

Application Route: Inhalative

Dose Levels: 1,03 - 2,05 - 4.1 mg/l

Exposure duration: 2 year(s)

Frequency of treatment: 6 hours/day, 5 days/week

Control group: yes

Method: OECD Test Guideline 451

Result: Animal testing did not show any carcinogenic effects.

NOAEL (Toxicity): >= 4.1 mg/l

LOAEL (Toxicity): ca. 2.05 mg/l

Species: Mouse, male/female

Application Route: Inhalative

Dose Levels: 2,05 - 4.1 mg/l

Exposure duration: 2 year(s)

Frequency of treatment: 6 hours/day, 5 days/week

Control group: yes

Method: OECD Test Guideline 451

Result: Animal testing did not show any carcinogenic effects.

1,4-dihydroxybenzene; hydroquinone; quinol

Species: rat, male/female

Application Route: Oral

Exposure duration: 103 weeks

Method: OECD Test Guideline 453

Reproductive toxicity/Fertility

styrene

NOAEL - Parents: 0.64 mg/l

NOAEL – F1: 0.64 mg/l

NOAEL – F2: 0.21 mg/l

NOAEL (parents, fertility): 2,13

Test type: Two-generation study

Species: rat, male/female

Application Route: Inhalative

Dose Levels: 0 - 0,21 - 0,64 - 2,13

Test substance: vapour

Frequency of treatment: 6 hours/day 7 days/week

Method: OECD Test Guideline 416

Animal testing did not show any effects on fertility.

Methacrylic acid, monoester with propane-1,2-diol

NOAEL – F1: ca. 1,000 mg/kg

Test type: Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test

Species: rat, male/female

Application Route: Oral Frequency of treatment: daily

Method: OECD Test Guideline 422

NOAEL (parents, generelly toxicity): 50 mg/kg

NOAEL (parents, fertility): 400 mg/kg

NOAEL (offspring): 400 mg/kg

Test type: Two-generation study

Species: rat, male/female

Application Route: Oral

Exposure duration: males: 15 weeks, females: 18 weeks

Frequency of treatment: daily

Method: OECD Test Guideline 416

1,4-dihydroxybenzene; hydroquinone; quinol

NOAEL - Parents: 150 mg/kg

NOAEL – F1: 150 mg/kg

NOAEL (parents, generelly toxicity): 15 mg/kg

Test type: Two-generation study

Species: rat, male/female

Application Route: Oral

Reproductive toxicity/Developmental Toxicity/Teratogenicity

styrene

NOAEL (teratogenicity): >= 2.13 mg/l

NOAEL (maternal): >= 2.13 mg/l

NOAEL (developmental toxicity): 0,21

LOAEL (developmental toxicity): 0,64

Species: rat, female

Application Route: Inhalative

Dose Levels: 0 - 0,21 - 0,64 - 2,13 mg/l

Test substance: vapour

Methacrylic acid, monoester with propane-1,2-diol

NOAEL (teratogenicity): 450 mg/kg

NOAEL (maternal): 50 mg/kg

NOAEL (developmental toxicity): 450 mg/kg body weight/day

Species: rabbit, female

Application Route: Oral
Dose Levels: 0 - 50 - 150 - 450 mg/kg body weight/day
Frequency of treatment: daily
Method: OECD Test Guideline 414

NOAEL (teratogenicity): 8.44 mg/l
NOAEL (maternal): 1.29 mg/l
NOAEL (developmental toxicity): 8,44 mg/l
Species: rat, female
Application Route: Inhalative
Dose Levels: 0,41 - 1,29 - 4,9 - 8,44 mg/l
Frequency of treatment: daily
Method: OECD Test Guideline 414

1,4-dihydroxybenzene; hydroquinone; quinol
NOAEL (teratogenicity): 300 mg/kg
NOAEL (maternal): 100 mg/kg
NOAEL (developmental toxicity): 100 mg/kg body weight/day
Species: rat
Application Route: Oral
Dose Levels: 30 - 100 - 300 mg/kg body weight/day
Method: OECD Test Guideline 414

Genotoxicity in vitro

styrene
Test type: Salmonella/microsome test (Ames test)
Metabolic activation: with/without
Result: positive

Test type: Chromosome aberration test in vitro
Test system: Human lymphocytes

Metabolic activation: without

Result: positive

Methacrylic acid, monoester with propane-1,2-diol

Test type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster ovary (CHO) cells

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 476

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 471

1,4-dihydroxybenzene; hydroquinone; quinol

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 471

Test type: In vitro mammalian cell gene mutation test

Test system: Mouse lymphoma cells

Metabolic activation: with/without

Result: positive

Method: OECD Test Guideline 476

Test type: Chromosome aberration test in vitro

Test system: Chinese hamster ovary (CHO) cells

Metabolic activation: without

Result: negative

Test type: Chromosome aberration test in vitro

Test system: Chinese hamster ovary (CHO) cells

Metabolic activation: with

Result: positive

Genotoxicity in vivo

styrene

Test type: In vivo micronucleus test

Species: Mouse, male

Application Route: Inhalative

Dose: 0 - 750 - 1500 mg/m³

Result: negative

Method: OECD Test Guideline 474

Test substance: vapour

Test type: Unscheduled DNA synthesis (UDS)

Species: Mouse, female

Application Route: Inhalative

Exposure duration: 6 h

Dose: 0 - 530 - 1060 mg/m³ Result: negative

Test substance: vapour

Methacrylic acid, monoester with propane-1,2-diol

Test type: Micronucleus test

Species: Mouse, male/female

Application Route: Oral Result: negative

Method: OECD Test Guideline 474

1,4-dihydroxybenzene; hydroquinone; quinol
Test type: In vivo micronucleus test
Species: Mouse, male
Application Route: intraperitoneal
Result: positive
Method: OECD Test Guideline 474

STOT evaluation – one-time exposure

styrene
May cause respiratory irritation.

Methacrylic acid, monoester with propane-1,2-diol
Based on available data, the classification criteria are not met.

1,4-dihydroxybenzene; hydroquinone; quinol
Based on available data, the classification criteria are not met.

STOT evaluation – repeated exposure

styrene
Route of exposure: Inhalative
Target Organs: auditory system
Causes damage to organs through prolonged or repeated exposure.

Methacrylic acid, monoester with propane-1,2-diol
Based on available data, the classification criteria are not met.

1,4-dihydroxybenzene; hydroquinone; quinol
Based on available data, the classification criteria are not met

Aspiration toxicity

styrene

May be fatal if swallowed and enters airways.

Methacrylic acid, monoester with propane-1,2-diol

Based on available data, the classification criteria are not met.

CMR Assessment

styrene

Carcinogenicity: Based on available data, the classification criteria are not met.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: Suspected of damaging the unborn child (Repr. 2).

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Methacrylic acid, monoester with propane-1,2-diol

Carcinogenicity: Based on available data, the classification criteria are not met.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

1,4-dihydroxybenzene; hydroquinone; quinol Carcinogenicity: Suspected of causing cancer (Carc. 2).

Mutagenicity: Suspected of causing genetic defects (Muta. 2).

Teratogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Toxicology Assessment

styrene

Acute effects: Harmful if inhaled. The product causes irritation of eyes, skin and mucous membranes. Sensitization: Based on available data, the classification criteria are not met.

Methacrylic acid, monoester with propane-1,2-diol Acute effects: Causes serious eye irritation.

Sensitization: May cause an allergic skin reaction.

11.2. Information on Other Hazards

No data available.

12. Ecological Information

12.1. Toxicity

Acute Fish toxicity

styrene

LC50 4.02 mg/l

Species: Pimephales promelas (fathead minnow)

Exposure duration: 96 h

Methacrylic acid, monoester with propane-1,2-diol LC50 493 mg/l

Species: Leuciscus idus (Golden orfe)

Exposure duration: 48 h

Method: DIN 38412

1,4-dihydroxybenzene; hydroquinone; quinol LC50 0.638 mg/l

Species: Oncorhynchus mykiss (rainbow trout)
Exposure duration: 96 h
Method: OECD Test Guideline 203

Chronic Fish toxicity

styrene
No data available.

Methacrylic acid, monoester with propane-1,2-diol
No data available.

1,4-dihydroxybenzene; hydroquinone; quinol
NOEC (Reproduction) 0.066 mg/l
Species: Pimephales promelas (fathead minnow)
Exposure duration: 32 d
Method: OECD Test Guideline 210

Acute toxicity for daphnia

styrene
EC50 4.7 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Methacrylic acid, monoester with propane-1,2-diol EC50 > 143 mg/l
Test type: semi-static test
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

1,4-dihydroxybenzene; hydroquinone; quinol EC50 0.134 mg/l

Species: Daphnia magna (Water flea)

Exposure duration: 48 h

Method: OECD Test Guideline 202

Chronic toxicity to daphnia

styrene

NOEC (Reproduction) 1.01 mg/l

Species: Daphnia magna (Water flea)

Exposure duration: 21 d

Method: OECD Test Guideline 211

Methacrylic acid, monoester with propane-1,2-diol

NOEC (Reproduction) 45.2 mg/l

Species: Daphnia magna (Water flea)

Exposure duration: 21 d

Method: OECD Test Guideline 211

1,4-dihydroxybenzene; hydroquinone; quinol

NOEC (Reproduction) 6 µg/l

Species: Daphnia magna (Water flea)

Exposure duration: 21 d

Method: OECD Test Guideline 211

Acute toxicity for algae

styrene

ErC50 4.9 mg/l

endpoint: Growth inhibition

Species: Pseudokirchneriella subcapitata (green algae)

Exposure duration: 72 h

Method: EPA OTS 797.1050

EC10 0.28 mg/l
endpoint: Growth inhibition
Species: Pseudokirchneriella subcapitata (green algae)
Exposure duration: 96 h
Method: EPA OTS 797.1050

Methacrylic acid, monoester with propane-1,2-diol EC50 > 97.2 mg/l
Test type: static test
endpoint: Growth inhibition
Species: Pseudokirchneriella subcapitata (green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

1,4-dihydroxybenzene; hydroquinone; quinol ErC50 0.33 mg/l
endpoint: Growth inhibition
Species: Pseudokirchneriella subcapitata (green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

NOEC 0.019 mg/l
endpoint: Growth inhibition
Species: Pseudokirchneriella subcapitata (green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

Acute bacterial toxicity

styrene
EC50 ca. 500 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 0.5 h

Method: OECD Test Guideline 209

Methacrylic acid, monoester with propane-1,2-diol
EC10 1,140 mg/l
Species: Pseudomonas putida

1,4-dihydroxybenzene; hydroquinone; quinol
IC50 71 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 2 h

Toxicity to soil dwelling organisms
styrene
NOEC (change in weight) 34 mg/kg
Species: Eisenia fetida (earthworms)
Exposure duration: 14 d
Method: OECD Test Guideline 207

Sediment Toxicity
styrene
Due to the low n-octanol-water partition coefficient, an adsorption on the sediment is not to be expected.

Ecotoxicology Assessment
styrene
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: Harmful to aquatic life with long lasting effects.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

Methacrylic acid, monoester with propane-1,2-diol
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: Based on available data, the classification criteria are not met.

M-Factor

1,4-dihydroxybenzene; hydroquinone; quinol
M-factor (acute aquat. tox.): 10
M-factor (chron. aquat. tox.): 1

12.2. Persistence and degradability

Biodegradability

styrene
Test type: aerobic
Inoculum: activated sludge
Biodegradation: 70.9 %, 28 d, i.e. readily biodegradable
Method: ISO DIN 9408

Methacrylic acid, monoester with propane-1,2-diol
Test type: aerobic
Biodegradation: 81 %, 28 d, i.e. readily biodegradable
Method: OECD Test Guideline 301 C

1,4-dihydroxybenzene; hydroquinone; quinol Biodegradation: 80 %, i.e. readily biodegradable
Method: Closed Bottle test

Stability in water

styrene

Test type: Hydrolysis

The study does not need to be conducted since the substance is readily biodegradable.

Methacrylic acid, monoester with propane-1,2-diol

Test type: Hydrolysis

Half life: 38.2 h (pH: 9)

Hydrolytic temperature: 40 °C

Method: OECD Test Guideline 111

Test type: Hydrolysis

Half life: 73.3 d (pH: 7)

Hydrolytic temperature: 40 °C

Method: OECD Test Guideline 111

Test type: Hydrolysis (pH: 4)

Hydrolytic temperature: 40 °C

Method: OECD Test Guideline 111 The substance is hydrolytically stable.

Photodegradation

styrene

Test type: Phototransformation in air

sensitizer: OH-radicals

Half-life indirect photolysis: 0.31 d

After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

Test type: Phototransformation in water

sensitizer: OH-radicals
Half-life indirect photolysis: 237 d
After evaporation or exposure to the air, the product will be slowly degraded by photochemical processes.

Methacrylic acid, monoester with propane-1,2-diol Test type: Phototransformation in air
Half life (direct photolysis): 0.6 d
Method: SRC - AOP (calculation)

Volatility (Henry's Law constant)
styrene
Calculated value = 231.6 Pa*m3/mol
The substance has to be scored as being highly volatile from water.

12.3. Bioaccumulative potential

Bioaccumulation
styrene
Bioconcentration factor (BCF): 74
Method: (calculated)
Due to the low n-octanol-water partition coefficient, an accumulation in organismsis not to be expected.

Methacrylic acid, monoester with propane-1,2-diol
Bioconcentration factor (BCF): 3.2

Partition coefficient (n-octanol/water)
styrene
log Pow: 2.96 at: 25 °C
Methacrylic acid, monoester with propane-1,2-diol

log Pow: 0.97 at: 20 °C

Method: OECD Test Guideline 107

12.4. Mobility in soil

Distribution among environmental compartments

styrene

Adsorption

Medium: Soil

Koc value: 352

log Koc value: 2.55

Method: value calculated

Moderately mobile in soils

Methacrylic acid, monoester with propane-1,2-diol

Adsorption

Medium: Soil

Koc value: 80

Method: calculated

Environmental distribution

styrene

Method: Calculation according to Mackay, Level I

The target compartment is air.

12.5. Results of PBT and vPvB

No data available.

12.6. Endocrine disrupting properties

No data available.

12.7. Other Adverse Effects

No data available.

13. Disposal Considerations

The information in this section contains generic advice and guidance. Reference number 2008/98/EC

Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used. Offer surplus and non-recyclable solutions to a licensed disposal company. Do not dispose of waste into sewer. The classification of the product may meet the criteria for a hazardous waste.

13.1. Waste Treatment Methods

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry"), they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry. Empty containers retain residue and can be dangerous.
Containers must be recycled in compliance with national legislation and environmental regulations. Dispose of empty containers and wastes safely. Do not burn, or use a cutting torch on, the empty drum. Vapour from product residues may

create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally.

No disposal into waste water.

14. Transport Information

ADR/RID

14.1 UN number or ID number	:	UN 1866
14.2 UN proper shipping name	:	RESIN SOLUTION
14.3 Transport hazard class(es)	:	3
Hazard Identification Number	:	30
14.4 Packing group	:	III
14.5 Environmental hazards	:	no

Special regulation for 'viscous substances' applicable

ADN

14.1 UN number or ID number	:	UN 1866
14.2 UN proper shipping name	:	RESIN SOLUTION
14.3 Transport hazard class(es)	:	3
Hazard Identification Number	:	30
14.4 Packing group	:	III
14.5 Environmental hazards	:	no

This classification data does not apply to transportation by tanker. If required, additional information can be requested from the manufacturer.

IATA

14.1 UN number or ID 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

IMDG

14.1 UN number or ID 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
EmS Code	:	F-E - S-E
Segregation Group IMDG	:	not applicable

14.1. Special precautions for user

See section 6 - 8.

Additional information: Combustible. Keep away from foodstuffs, acids and alkalis.

14.2. Maritime transport in bulk according to IMO instruments

Product is not transported by us in bulk.

15. Regulatory Information

15.1. Safety, Health And Environmental Regulations / Legislation Specific For The Substance Or Mixture

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.

P5c Flammable liquids

Quantity1:	5,000 t	Quantity2:	50,000 t

Water contaminating class (Germany)

2 water endangering

Classification according to AwSV, Annex 1 (5.2)

Other regulations

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has not been conducted for this substance / mixture resp. its components.

16. Other Information

Full text of the hazard statements of the CLP classification (1272/2008/CE) referred to under sections 2, 3 and 10.

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.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H351	Suspected of causing cancer.
H361d	Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Abbreviations and acronyms

ADN	Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation intérieure
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials (US)
ATE	Acute Toxic Estimate
AwSv	Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen
BCF	Bioconcentration Factor
CAS	Chemical Abstract Service
CLP	Regulation on Classification, Labelling and Packaging of Substances and Mixtures
CMR	Cancerogenic Mutagenic Reprotoxic
DIN	Deutsches Institut für Normung
DNEL	Derived No-Effect Level
EC...	Effect Concentration ... %

EWC	European Waste Catalogue
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Organization for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LOAEL	Lowest Observable Adverse Effect Level
LC…	Lethal Concentration, ...%
LD…	Lethal Dose, ...%
MARPOL	International Convention for the Prevention of Pollution From Ships
NOAEL	No Observed Adverse Effect Level
NOEL/NOEC	No Observed Effect Level/Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	persistent, bioaccumulative, toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire de marchandises Dangereuses
STOT	Specific Target Organ Toxicity
TRGS	Technische Regeln für Gefahrstoffe
vPvB	very Persistent, very Bioaccumulative
WGK	Wassergefährdungsklasse

Further information

Classification of the mixture:	Classification procedure:
Flam. Liq. 3 H226	Based on product data or assessment
Skin Irrit. 2 H315	Calculation method
Eye Irrit. 2 H319	Calculation method
Repr. 2 H361d	Calculation method
STOT SE 3 H335	Calculation method
STOT RE 1 H372	Calculation method
Aquatic Chronic 3 H412	Calculation method

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