

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

1.1. Product identifier

Product Description: JM-21 Multi-element Oil Based Standard, Specpure®, 900µg/g
Cat No. : 36769

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

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company
Avocado Research Chemicals Ltd.
(Part of Thermo Fisher Scientific)
Shore Road, Heysham
Lancashire, LA3 2XY,
United Kingdom
Office Tel: +44 (0) 1524 850506
Office Fax: +44 (0) 1524 850608

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No. **US**:001-800-424-9300 / **Europe**:001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Physical hazards

Based on available data, the classification criteria are not met

Health hazards

Based on available data, the classification criteria are not met

Environmental hazards

Based on available data, the classification criteria are not met

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Full text of Hazard Statements: see section 16

2.2. Label elements

None required

EUH210 - Safety data sheet available on request

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Component	CAS No	EC No	Weight %	CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
White mineral oil	8042-47-5	EEC No. 232-455-8	98.11	-
Zinc	7440-66-6	231-175-3	0.09	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410) Pyr. Sol. 1 (H250) Water-react. 1 (H260)
Vanadium	7440-62-2	EEC No. 231-171-1	0.09	-
Titanium	7440-32-6	EEC No. 231-142-3	0.09	-
Tin	7440-31-5	EEC No. 231-141-8	0.09	-
Sodium	7440-23-5	EEC No. 231-132-9	0.09	Water-react. 1 (H260) Skin Corr. 1B (H314) Eye Dam. 1 (H318) EUH014
Silver	7440-22-4	EEC No. 231-131-3	0.09	-
Silicon	7440-21-3	EEC No. 231-130-8	0.09	-
Phosphorus	7723-14-0	EEC No. 231-768-7	0.09	Flam. Sol. 1 (H228) Aquatic Chronic 3 (H412)
Nickel	7440-02-0	EEC No. 231-111-4	0.09	Skin Sens. 1 (H317) Carc. 2 (H351) STOT RE 1 (H372)
Molybdenum	7439-98-7	EEC No. 231-107-2	0.09	Flam. Sol. 2 (H228)
Manganese	7439-96-5	EEC No. 231-105-1	0.09	Flam. Sol. 2 (H228)
Magnesium	7439-95-4	EEC No. 231-104-6	0.09	Flam. Sol. 1 (H228) Water-react. 2 (H261) Self-heat. 2 (H252)
Lead	7439-92-1	EEC No. 231-100-4	0.09	Acute Tox. 4 (H332) Acute Tox. 4 (H302) Repr. 1A (H360Df) STOT RE 2 (H373) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)
Iron	7439-89-6	EEC No. 231-096-4	0.09	-
Copper	7440-50-8	EEC No. 231-159-6	0.09	Flam. Sol. 2 (H228) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)
Chromium	7440-47-3	EEC No. 231-157-5	0.09	-
Calcium	7440-70-2	EEC No. 231-179-5	0.09	Water-react. 2 (H261)

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Cadmium	7440-43-9	EEC No. 231-152-8	0.09	Acute Tox. 2 (H330) Muta. 2 (H341) Carc. 1B (H350) Repr. 2 (H361fd) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)
Boron	7440-42-8	EEC No. 231-151-2	0.09	-
Barium	7440-39-3	EEC No. 231-149-1	0.09	Flam. Sol. 2 (H228) Water-react. 1 (H260) Acute Tox. 3 (H301) Skin Corr. 1B (H314) Eye Dam. 1 (H318)
Aluminum	7429-90-5	EEC No. 231-072-3	0.09	-

Component	Specific concentration limits (SCL's)	M-Factor	Component notes
Zinc	-	1	-
Lead	Repr. 1A : C ≥ 0.03 % STOT RE 1 : C ≥ 0.5 %	1 (acute) 10 (Chronic)	-
Cadmium	-	10	-

Note

Elements and concentrations in ug/ml are as follows:

Ag 900, Al 900, B 900, Ba 900, Ca 900, Cd 900, Cr 900, Cu 900, Fe 900, Mg 900, Mn 900, Mo 900, Na 900, Ni 900, P 900, Pb 900, Si 900, Sn 900, Ti 900, V 900, Zn 900

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.
Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur.
Self-Protection of the First Aider	No special precautions required.

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

None reasonably foreseeable.

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

Notes to Physician	Treat symptomatically.
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SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray, carbon

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dioxide (CO₂), dry chemical, alcohol-resistant foam.

Extinguishing media which must not be used for safety reasons

No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products

Metal oxides, Heavy metal oxides.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required.

6.2. Environmental precautions

Should not be released into the environment. Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Sweep up and shovel into suitable containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Technical Rules for Hazardous Substances (TRGS) 510
Storage Class (LGK) (Germany)

Class 10

7.3. Specific end use(s)

Use in laboratories

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. **IRE** - 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
Tin	STEL: 4 mg/m ³ 15 min TWA: 2 mg/m ³ 8 hr		TWA: 2 mg/m ³ 8 hr. Sn STEL: 6 mg/m ³ 15 min
Silver	STEL: 0.3 mg/m ³ 15 min TWA: 0.1 mg/m ³ 8 hr	TWA: 0.1 mg/m ³ (8h)	TWA: 0.1 mg/m ³ 8 hr. Ag metallic STEL: 0.3 mg/m ³ 15 min
Silicon	STEL: 30 ppm 15 min STEL: 12 mg/m ³ 15 min TWA: 10 mg/m ³ 8 hr TWA: 4 mg/m ³ 8 hr		TWA: 4 mg/m ³ 8 hr. respirable dust TWA: 10 mg/m ³ 8 hr. Si total inhalable dust STEL: 30 mg/m ³ 15 min STEL: 12 mg/m ³ 15 min
Nickel	STEL: 1.5 mg/m ³ 15 min TWA: 0.5 mg/m ³ 8 hr Skin		TWA: 0.5 mg/m ³ 8 hr. STEL: 1.5 mg/m ³ 15 min
Molybdenum	STEL: 20 mg/m ³ 15 min TWA: 10 mg/m ³ 8 hr		
Manganese	STEL: 0.6 mg/m ³ 15 min STEL: 0.15 mg/m ³ 15 min TWA: 0.2 mg/m ³ 8 hr TWA: 0.05 mg/m ³ 8 hr	TWA: 0.2 mg/m ³ (8h) TWA: 0.05 mg/m ³ (8h)	TWA: 0.2 mg/m ³ 8 hr. Mn fume; inhalable fraction TWA: 0.2 mg/m ³ 8 hr. inhalable fraction TWA: 0.05 mg/m ³ 8 hr. respirable fraction TWA: 0.02 mg/m ³ 8 hr. Mn fume; respirable fraction STEL: 0.15 mg/m ³ 15 min STEL: 0.6 mg/m ³ 15 min STEL: 3 mg/m ³ 15 min
Lead	STEL: 0.45 mg/m ³ 15 min TWA: 0.15 mg/m ³ 8 hr	TWA: 0.15 mg/m ³ (8h)	TWA: 0.15 mg/m ³ 8 hr. STEL: 0.45 mg/m ³ 15 min
Copper	STEL: 0.6 mg/m ³ 15 min STEL: 2 mg/m ³ 15 min TWA: 1 mg/m ³ 8 hr TWA: 0.2 mg/m ³ 8 hr		TWA: 0.2 mg/m ³ 8 hr. Cu fume TWA: 1 mg/m ³ 8 hr. Cu dusts and mists STEL: 2 mg/m ³ 15 min STEL: 0.6 mg/m ³ 15 min
Chromium	STEL: 1.5 mg/m ³ 15 min TWA: 0.5 mg/m ³ 8 hr	TWA: 2 mg/m ³ (8hr)	TWA: 2 mg/m ³ 8 hr. STEL: 6 mg/m ³ 15 min
Cadmium	STEL: 0.075 mg/m ³ 15 min TWA: 0.025 mg/m ³ 8 hr Carc. metal	TWA: 0.001 mg/m ³ (8h)	TWA: 0.001 mg/m ³ 8 hr. inhalable fraction TWA: 0.004 mg/m ³ 8 hr. limit value 0.004 mg/m ³ until 11 July 2027 inhalable fraction STEL: 0.003 mg/m ³ 15 min STEL: 0.012 mg/m ³ 15 min
Aluminum	STEL: 30 mg/m ³ 15 min STEL: 12 mg/m ³ 15 min TWA: 10 mg/m ³ 8 hr TWA: 4 mg/m ³ 8 hr		TWA: 1 mg/m ³ 8 hr. respirable fraction STEL: 3 mg/m ³ 15 min

Biological limit values

List source(s):

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

See table for values

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Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
White mineral oil 8042-47-5 (98.11)				DNEL = 217.05mg/kg bw/day
Zinc 7440-66-6 (0.09)				DNEL = 83mg/kg bw/day
Tin 7440-31-5 (0.09)				DNEL = 10mg/kg bw/day
Phosphorus 7723-14-0 (0.09)				DNEL = 30mg/kg bw/day
Nickel 7440-02-0 (0.09)			DNEL = 0.035mg/cm2	
Copper 7440-50-8 (0.09)		DNEL = 273mg/kg bw/day		DNEL = 137mg/kg bw/day
Boron 7440-42-8 (0.09)				DNEL = 5555.6mg/kg bw/day
Barium 7440-39-3 (0.09)				DNEL = 28.5mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
White mineral oil 8042-47-5 (98.11)				DNEL = 164.56mg/m³
Zinc 7440-66-6 (0.09)				DNEL = 5mg/m³
Tin 7440-31-5 (0.09)				DNEL = 71mg/m³
Silver 7440-22-4 (0.09)				DNEL = 0.1mg/m³
Phosphorus 7723-14-0 (0.09)				DNEL = 4mg/m³
Nickel 7440-02-0 (0.09)	DNEL = 11.9mg/m³		DNEL = 0.05mg/m³	DNEL = 0.05mg/m³
Molybdenum 7439-98-7 (0.09)				DNEL = 11.7mg/m³
Iron 7439-89-6 (0.09)			DNEL = 3mg/m³	
Chromium 7440-47-3 (0.09)			DNEL = 0.5mg/m³	
Calcium 7440-70-2 (0.09)	DNEL = 4mg/m³		DNEL = 1mg/m³	
Cadmium 7440-43-9 (0.09)			DNEL = 4µg/m³	
Boron 7440-42-8 (0.09)				DNEL = 97.95mg/m³
Barium 7440-39-3 (0.09)				DNEL = 5.8mg/m³

Predicted No Effect Concentration (PNEC)

See values below.

Component	Fresh water	Fresh water sediment	Water Intermittent	Microorganisms in sewage treatment	Soil (Agriculture)
Zinc 7440-66-6 (0.09)	PNEC = 20.6µg/L	PNEC = 235.6mg/kg sediment dw		PNEC = 100µg/L	PNEC = 106.8mg/kg soil dw
Vanadium 7440-62-2 (0.09)	PNEC = 7.6µg/L	PNEC = 240mg/kg sediment dw	PNEC = 6.93µg/L	PNEC = 450µg/L	PNEC = 7.2mg/kg soil dw
Titanium 7440-32-6 (0.09)	PNEC = 0.076mg/L	PNEC = 600mg/kg sediment dw	PNEC = 0.37mg/L	PNEC = 60mg/L	PNEC = 60mg/kg soil dw
Silver	PNEC = 0.04µg/L	PNEC =		PNEC = 0.025mg/L	PNEC = 1.41mg/kg

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7440-22-4 (0.09)		438.13mg/kg sediment dw			soil dw
Phosphorus 7723-14-0 (0.09)	PNEC = 10.5µg/L	PNEC = 100mg/kg sediment dw	PNEC = 105µg/L	PNEC = 10mg/L	PNEC = 12.5mg/kg soil dw
Nickel 7440-02-0 (0.09)	PNEC = 7.1µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.33mg/L	PNEC = 29.9mg/kg soil dw
Molybdenum 7439-98-7 (0.09)	PNEC = 12.7mg/L	PNEC = 22600mg/kg sediment dw		PNEC = 21.7mg/L	PNEC = 9.9mg/kg soil dw
Lead 7439-92-1 (0.09)	PNEC = 2.4µg/L	PNEC = 186mg/kg sediment dw		PNEC = 100µg/L	PNEC = 212mg/kg soil dw
Copper 7440-50-8 (0.09)	PNEC = 7.8µg/L	PNEC = 87mg/kg sediment dw		PNEC = 230µg/L	PNEC = 65mg/kg soil dw
Chromium 7440-47-3 (0.09)	PNEC = 6.5µg/L	PNEC = 205.7mg/kg sediment dw			PNEC = 21.1mg/kg soil dw
Cadmium 7440-43-9 (0.09)	PNEC = 0.19µg/L	PNEC = 1.8mg/kg sediment dw		PNEC = 20µg/L	PNEC = 0.9mg/kg soil dw
Boron 7440-42-8 (0.09)	PNEC = 2.9mg/L		PNEC = 13.7mg/L	PNEC = 10mg/L	PNEC = 5.7mg/kg soil dw
Barium 7440-39-3 (0.09)	PNEC = 114.7µg/L	PNEC = 598.9mg/kg sediment dw		PNEC = 62.2mg/L	PNEC = 207.7mg/kg soil dw
Aluminum 7429-90-5 (0.09)				PNEC = 20mg/L	

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
Zinc 7440-66-6 (0.09)	PNEC = 6.1µg/L	PNEC = 121mg/kg sediment dw			
Vanadium 7440-62-2 (0.09)	PNEC = 2.5µg/L	PNEC = 79mg/kg sediment dw		PNEC = 0.167mg/kg food	
Titanium 7440-32-6 (0.09)	PNEC = 0.6mg/L	PNEC = 60mg/kg sediment dw			
Silver 7440-22-4 (0.09)	PNEC = 0.86µg/L	PNEC = 438.13mg/kg sediment dw			
Phosphorus 7723-14-0 (0.09)	PNEC = 1.05µg/L	PNEC = 10mg/kg sediment dw			
Nickel 7440-02-0 (0.09)	PNEC = 8.6µg/L	PNEC = 109mg/kg sediment dw		PNEC = 0.12mg/kg food	
Molybdenum 7439-98-7 (0.09)	PNEC = 2.28mg/L	PNEC = 2368mg/kg sediment dw			
Lead 7439-92-1 (0.09)	PNEC = 3.3µg/L	PNEC = 168mg/kg sediment dw		PNEC = 10.9mg/kg food	
Copper 7440-50-8 (0.09)	PNEC = 5.2µg/L	PNEC = 676mg/kg sediment dw			
Cadmium 7440-43-9 (0.09)	PNEC = 1.14µg/L	PNEC = 0.64mg/kg sediment dw		PNEC = 0.16mg/kg food	
Boron 7440-42-8 (0.09)	PNEC = 2.9mg/L				

8.2. Exposure controls

Engineering Measures

None under normal use conditions.

Personal protective equipment

Eye Protection

Wear safety glasses with side shields (or goggles) (European standard - EN 166)

Hand Protection

Protective gloves

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Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	See manufacturers recommendations	-	EN 374	(minimum requirement)

Skin and body protection Long sleeved clothing.

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Respiratory Protection No protective equipment is needed under normal use conditions.

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Particle filter

Small scale/Laboratory use Maintain adequate ventilation

Environmental exposure controls No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State	Liquid	
Appearance	Amber	
Odor	Petroleum distillates	
Odor Threshold	No data available	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	> 315 °C / 599 °F	
Flammability (liquid)	No data available	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	No data available	
Flash Point	> 232 °C / > 449.6 °F	Method - No information available
Autoignition Temperature	351 °C / 663.8 °F	
Decomposition Temperature	No data available	
pH	Not applicable	
Viscosity	No data available	
Water Solubility	Immiscible	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Component	log Pow	
White mineral oil	6	
Vapor Pressure	No data available	
Density / Specific Gravity	0.75 g/cm3	@ 20 °C
Bulk Density	Not applicable	Liquid
Vapor Density	No data available	(Air = 1.0)
Particle characteristics	Not applicable (liquid)	

9.2. Other information

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SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization Hazardous Reactions

No information available.

None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

Metal oxides. Heavy metal oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

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

Product Information

(a) acute toxicity;

Oral

Based on available data, the classification criteria are not met

Dermal

Based on available data, the classification criteria are not met

Inhalation

Based on available data, the classification criteria are not met

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
White mineral oil	>5000 mg/kg (Rat)	>3000 mg/kg (Rabbit)	-
Zinc	LD50 = 630 mg/kg (Rat)	-	-
Vanadium	LD50 > 2000 mg/kg (Rat)	-	-
Tin	> 2000 mg/kg (Rat)	> 2000 mg/kg (Rat)	LC50 > 4.75 mg/L (Rat) 4 h
Silver	> 2000 mg/kg (Rat)	LD50 > 2000 mg/kg (rat)	LC50 > 5.16 mg/L (Rat) 4 h
Silicon	LD50 = 3160 mg/kg (Rat)	-	-
Phosphorus	>15000 mg/kg (Rat Female)	-	LC50 = 4.3 mg/L (Rat) 1 h
Nickel	LD50 > 9000 mg/kg (Rat)	-	LC50 > 10.2 mg/L (Rat) 1 h
Molybdenum	-	LD50 > 2000 mg/kg (Rat)	LC50 > 5.84 mg/L (Rat) 4 h
Manganese	LD50 = 9 g/kg (Rat)	-	LC50 > 5.14 mg/L (Rat) 4 h
Magnesium	LD50 = 230 mg/kg (Rat)	-	-
Iron	7500 mg/kg (Rat)	-	-
Copper	-	-	LC50 > 5.11 mg/L (Rat) 4 h
Cadmium	LD50 = 2330 mg/kg (Rat)	-	LC50 = 25 mg/m ³ (Rat) 30 min
Boron	LD50 > 2000 mg/kg (Rat) (OCED 423)	-	LC50 > 5.08 mg/L (Rat) 4 h

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Barium	LD50 = 132 mg/kg (Rat)	-	-
Aluminum	-	-	LC50 > 0.888 mg/L (Rat) 4 h

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;

Respiratory No data available
Skin No data available

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available

The table below indicates whether each agency has listed any ingredient as a carcinogen

Component	EU	UK	Germany	IARC
Nickel			Cat. 1	Group 2B
Lead				Group 2A
Cadmium	Carc Cat. 1B		Cat. 1	Group 1

(g) reproductive toxicity; No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available

Target Organs None known.

(j) aspiration hazard; No data available

Symptoms / effects, both acute and delayed No information available.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects

May cause long-term adverse effects in the environment. Do not allow material to contaminate ground water system.

Component	Freshwater Fish	Water Flea	Freshwater Algae
White mineral oil	LC50: > 10000 mg/L, 96h (Lepomis macrochirus)		
Zinc	LC50: = 0.41 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 0.59 mg/L, 96h semi-static (Oncorhynchus)	EC50: 0.139 - 0.908 mg/L, 48h Static (Daphnia magna)	EC50: 0.09 - 0.125 mg/L, 72h static (Pseudokirchneriella subcapitata) EC50: 0.11 - 0.271 mg/L, 96h

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	<p>mykiss) LC50: 2.16 - 3.05 mg/L, 96h flow-through (Pimephales promelas) LC50: 0.211 - 0.269 mg/L, 96h semi-static (Pimephales promelas) LC50: = 2.66 mg/L, 96h static (Pimephales promelas) LC50: = 30 mg/L, 96h (Cyprinus carpio) LC50: = 0.45 mg/L, 96h semi-static (Cyprinus carpio) LC50: = 7.8 mg/L, 96h static (Cyprinus carpio) LC50: = 0.24 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: = 3.5 mg/L, 96h static (Lepomis macrochirus)</p>		static (Pseudokirchneriella subcapitata)
Silver	<p>LC50: = 0.064 mg/L, 96h static (Lepomis macrochirus) LC50: = 0.0062 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 0.00155 - 0.00293 mg/L, 96h static (Pimephales promelas)</p>	<p>EC50: = 0.00024 mg/L, 48h Static (Daphnia magna)</p>	
Phosphorus	<p>LC50: 33.2 mg/L/96h (Danio rerio)</p>	<p>EC50: 10.5 mg/L/48h</p>	
Nickel	<p>LC50: > 100 mg/L, 96h (Brachydanio rerio) LC50: = 1.3 mg/L, 96h semi-static (Cyprinus carpio) LC50: = 10.4 mg/L, 96h static (Cyprinus carpio)</p>	<p>EC50 = 510 µg/L 96h</p>	<p>EC50 = 0.1 mg/L 72h EC50 = 0.18 mg/L 72h</p>
Manganese	<p>LC50: > 3.6 mg/L, 96h semi-static (Oncorhynchus mykiss)</p>		
Lead	<p>LC50: = 1.32 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 1.17 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: = 0.44 mg/L, 96h semi-static (Cyprinus carpio)</p>	<p>EC50: = 600 µg/L, 48h (water flea)</p>	
Copper	<p>Onchorhynchys mykiss: LC50=0.15 mg/L 96h Cuprinus carpio: LC50=0.8 mg/L 96h</p>	<p>EC50: = 0.03 mg/L, 48h Static (Daphnia magna)</p>	<p>0.0426-0.0535 mg/L EC50 72 h 0.031-0.054 mg/L EC50 96 h</p>
Cadmium	<p>LC50: 0.0004 - 0.003 mg/L, 96h (Pimephales promelas) LC50: = 0.016 mg/L, 96h (Oryzias latipes) LC50: = 21.1 mg/L, 96h flow-through (Lepomis macrochirus) LC50: = 0.24 mg/L, 96h static (Cyprinus carpio) LC50: = 4.26 mg/L, 96h semi-static (Cyprinus carpio) LC50: = 0.002 mg/L, 96h (Cyprinus carpio) LC50: = 0.006 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 0.003 mg/L, 96h flow-through (Oncorhynchus mykiss)</p>	<p>EC50: = 0.0244 mg/L, 48h Static (Daphnia magna)</p>	

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Barium	LC50: > 500 mg/L/96h (Cyprinodon variegatus)		
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Component	Microtox	M-Factor
Zinc		1
Lead		1 (acute) 10 (Chronic)
Cadmium		10

12.2. Persistence and degradability Product contains heavy metals. Discharge into the environment must be avoided. Special pre-treatment is necessary
Persistence May persist.
Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential Product has a high potential to bioconcentrate

Component	log Pow	Bioconcentration factor (BCF)
White mineral oil	6	No data available
Phosphorus		<200 dimensionless
Chromium		1.03 - 1.22

12.4. Mobility in soil Spillage unlikely to penetrate soil The product is insoluble and floats on water Is not likely mobile in the environment due its low water solubility. Is not likely mobile in the environment due its low water solubility and propensity to bind to soil particles

12.5. Results of PBT and vPvB assessment Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Endocrine disrupting properties
Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects
Persistent Organic Pollutant This product does not contain any known or suspected substance
Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Contaminated Packaging Empty remaining contents. Dispose of in accordance with local regulations. Do not re-use empty containers.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information Waste codes should be assigned by the user based on the application for which the product was used.

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SECTION 14: TRANSPORT INFORMATION

IMDG/IMO Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

ADR Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

IATA Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

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

International Inventories

China, X = listed, Australia, U.S.A. (TSCA), Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Australia (AICS), Korea (KECL), China (IECSC), Japan (ENCS), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
White mineral oil	8042-47-5	232-455-8	-	-	X	X	KE-35412	X	X
Zinc	7440-66-6	231-175-3	-	-	X	X	KE-35518	X	-
Vanadium	7440-62-2	231-171-1	-	-	X	X	KE-35266	X	-
Titanium	7440-32-6	231-142-3	-	-	X	X	KE-33881	X	-
Tin	7440-31-5	231-141-8	-	-	X	X	KE-33838	X	-
Sodium	7440-23-5	231-132-9	-	-	X	X	KE-31338	X	X
Silver	7440-22-4	231-131-3	-	-	X	X	KE-31261	X	-
Silicon	7440-21-3	231-130-8	-	-	X	X	KE-31029	X	-
Phosphorus	7723-14-0	231-768-7	-	-	X	X	KE-28713	X	-
Nickel	7440-02-0	231-111-4	-	-	X	X	KE-25818	X	-
Molybdenum	7439-98-7	231-107-2	-	-	X	X	KE-25427	X	-
Manganese	7439-96-5	231-105-1	-	-	X	X	KE-22999	X	-
Magnesium	7439-95-4	231-104-6	-	-	X	X	KE-22673	X	-
Lead	7439-92-1	231-100-4	-	-	X	X	KE-21887	X	-
Iron	7439-89-6	231-096-4	-	-	X	X	KE-21059	X	-
Copper	7440-50-8	231-159-6	-	-	X	X	KE-08896	X	-
Chromium	7440-47-3	231-157-5	-	-	X	X	KE-05970	X	-
Calcium	7440-70-2	231-179-5	-	-	X	X	KE-04462	X	-
Cadmium	7440-43-9	231-152-8	-	-	X	X	KE-04397	X	-
Boron	7440-42-8	231-151-2	-	-	X	X	KE-03518	X	-
Barium	7440-39-3	231-149-1	-	-	X	X	KE-02022	X	-
Aluminum	7429-90-5	231-072-3	-	-	X	X	KE-00881	X	-

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Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
White mineral oil	8042-47-5	X	ACTIVE	X	-	X	X	X
Zinc	7440-66-6	X	ACTIVE	X	-	X	X	X
Vanadium	7440-62-2	X	ACTIVE	X	-	X	X	X
Titanium	7440-32-6	X	ACTIVE	X	-	X	X	X
Tin	7440-31-5	X	ACTIVE	X	-	X	X	X
Sodium	7440-23-5	X	ACTIVE	X	-	X	X	X
Silver	7440-22-4	X	ACTIVE	X	-	X	X	X
Silicon	7440-21-3	X	ACTIVE	X	-	X	X	X
Phosphorus	7723-14-0	X	ACTIVE	X	-	X	X	X
Nickel	7440-02-0	X	ACTIVE	X	-	X	X	X
Molybdenum	7439-98-7	X	ACTIVE	X	-	X	X	X
Manganese	7439-96-5	X	ACTIVE	X	-	X	X	X
Magnesium	7439-95-4	X	ACTIVE	X	-	X	X	X
Lead	7439-92-1	X	ACTIVE	X	-	X	X	X
Iron	7439-89-6	X	ACTIVE	X	-	X	X	X
Copper	7440-50-8	X	ACTIVE	X	-	X	X	X
Chromium	7440-47-3	X	ACTIVE	X	-	X	X	X
Calcium	7440-70-2	X	ACTIVE	X	-	X	X	X
Cadmium	7440-43-9	X	ACTIVE	X	-	X	X	X
Boron	7440-42-8	X	ACTIVE	X	-	X	X	X
Barium	7440-39-3	X	ACTIVE	X	-	X	X	X
Aluminum	7429-90-5	X	ACTIVE	X	-	X	X	X

Legend: X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
White mineral oil	8042-47-5	-	-	-
Zinc	7440-66-6	-	Use restricted. See item 75. (see link for restriction details)	-
Vanadium	7440-62-2	-	-	-
Titanium	7440-32-6	-	-	-
Tin	7440-31-5	-	Use restricted. See item 75. (see link for restriction details)	-
Sodium	7440-23-5	-	Use restricted. See item 75. (see link for restriction details)	-
Silver	7440-22-4	-	Use restricted. See item 75. (see link for restriction details)	-
Silicon	7440-21-3	-	-	-
Phosphorus	7723-14-0	-	Use restricted. See item 75. (see link for restriction details)	-
Nickel	7440-02-0	-	Use restricted. See item 27. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	-
Molybdenum	7439-98-7	-	-	-

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Manganese	7439-96-5	-	-	-
Magnesium	7439-95-4	-	-	-
Lead	7439-92-1	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 30. (see link for restriction details) Use restricted. See item 63. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	SVHC Candidate list - 231-100-4 - Toxic for reproduction (Article 57c)
Iron	7439-89-6	-	-	-
Copper	7440-50-8	-	Use restricted. See item 75. (see link for restriction details)	-
Chromium	7440-47-3	-	Use restricted. See item 75. (see link for restriction details)	-
Calcium	7440-70-2	-	-	-
Cadmium	7440-43-9	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 23. (see link for restriction details) Use restricted. See item 28. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	SVHC Candidate list - 231-152-8 - Carcinogenic, Article 57a; Specific target organ toxicity after repeated exposure, Article 57(f) - human health
Boron	7440-42-8	-	-	-
Barium	7440-39-3	-	Use restricted. See item 75. (see link for restriction details)	-
Aluminum	7429-90-5	-	Use restricted. See item 75. (see link for restriction details)	-

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

REACH links

<https://echa.europa.eu/authorisation-list>

<https://echa.europa.eu/substances-restricted-under-reach>

<https://echa.europa.eu/candidate-list-table>

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
White mineral oil	8042-47-5	Not applicable	Not applicable
Zinc	7440-66-6	Not applicable	Not applicable
Vanadium	7440-62-2	Not applicable	Not applicable

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Titanium	7440-32-6	Not applicable	Not applicable
Tin	7440-31-5	Not applicable	Not applicable
Sodium	7440-23-5	Not applicable	Not applicable
Silver	7440-22-4	Not applicable	Not applicable
Silicon	7440-21-3	Not applicable	Not applicable
Phosphorus	7723-14-0	Not applicable	Not applicable
Nickel	7440-02-0	Not applicable	Not applicable
Molybdenum	7439-98-7	Not applicable	Not applicable
Manganese	7439-96-5	Not applicable	Not applicable
Magnesium	7439-95-4	Not applicable	Not applicable
Lead	7439-92-1	Not applicable	Not applicable
Iron	7439-89-6	Not applicable	Not applicable
Copper	7440-50-8	Not applicable	Not applicable
Chromium	7440-47-3	Not applicable	Not applicable
Calcium	7440-70-2	Not applicable	Not applicable
Cadmium	7440-43-9	Not applicable	Not applicable
Boron	7440-42-8	Not applicable	Not applicable
Barium	7440-39-3	Not applicable	Not applicable
Aluminum	7429-90-5	Not applicable	Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Component	ANNEX I - PART 1 List of chemicals subject to export notification procedure (referred to in Article 8)	ANNEX I - PART 2 List of chemicals qualifying for PIC notification (referred to in Article 11)	ANNEX I - PART 3 List of chemicals subject to the PIC procedure (referred to in Articles 13 and 14)
Lead 7439-92-1 (0.09)	sr — severe restriction i(2) — industrial chemical for public	-	-
Cadmium 7440-43-9 (0.09)	i(1) — industrial chemical for professional use sr — severe restriction i(2) — industrial chemical for public sr — severe restriction	i — industrial chemical sr — severe restriction	-

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012R0649&qid=1604065742303>.

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

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 .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

Water endangering class = 1 (self classification)

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
White mineral oil	WGK1	
Zinc	WGK2	
Vanadium	WGK3	Class III : 1 mg/m ³ (Massenkonzentration)
Titanium	nwg	
Tin	nwg	Class III : 1 mg/m ³ (Massenkonzentration)
Sodium	WGK1	
Silver	nwg	
Silicon	nwg	

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Phosphorus	WGK1	
Nickel	WGK 2	Class II : 0.5 mg/m ³ (Massenkonzentration) Krebserzeugende Stoffe - Class II : 0.5 mg/m ³ (Massenkonzentration)
Molybdenum	nwg	
Manganese	WGK2	Class III : 1 mg/m ³ (Massenkonzentration)
Magnesium	nwg	
Lead	nwg	Class II : 0.5 mg/m ³ (Massenkonzentration)
Iron	nwg	
Copper	WGK2	Class III : 1 mg/m ³ (Massenkonzentration)
Chromium	nwg	Class III : 1 mg/m ³ (Massenkonzentration)
Calcium	WGK1	
Cadmium	WGK3	Krebserzeugende Stoffe - Class I : 0.05 mg/m ³ (Massenkonzentration)
Boron	nwg	
Barium	WGK1	
Aluminum	nwg	

Component	France - INRS (Tables of occupational diseases)
White mineral oil	Tableaux des maladies professionnelles (TMP) - RG 36bis
Zinc	Tableaux des maladies professionnelles (TMP) - RG 61
Vanadium	Tableaux des maladies professionnelles (TMP) - RG 66
Phosphorus	Tableaux des maladies professionnelles (TMP) - RG 5
Lead	Tableaux des maladies professionnelles (TMP) - RG 1
Iron	Tableaux des maladies professionnelles (TMP) - RG 44,RG 44bis,RG 94
Chromium	Tableaux des maladies professionnelles (TMP) - RG 10
Cadmium	Tableaux des maladies professionnelles (TMP) - RG 61,RG 61bis
Aluminum	Tableaux des maladies professionnelles (TMP) - RG 32 Tableaux des maladies professionnelles (TMP) - RG 16,RG 16bis

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
Zinc 7440-66-6 (0.09)	Prohibited and Restricted Substances		
Vanadium 7440-62-2 (0.09)	Prohibited and Restricted Substances		
Phosphorus 7723-14-0 (0.09)	Prohibited and Restricted Substances		
Nickel 7440-02-0 (0.09)	Prohibited and Restricted Substances		
Lead 7439-92-1 (0.09)	Prohibited and Restricted Substances		
Copper 7440-50-8 (0.09)	Prohibited and Restricted Substances		
Chromium 7440-47-3 (0.09)	Prohibited and Restricted Substances		
Cadmium 7440-43-9 (0.09)	Prohibited and Restricted Substances		Annex I - industrial chemical

15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

SECTION 16: OTHER INFORMATION

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

H228 - Flammable solid

H250 - Catches fire spontaneously if exposed to air

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H252 - Self-heating in large quantities; may catch fire
H260 - In contact with water releases flammable gases which may ignite spontaneously
H261 - In contact with water releases flammable gases
H302 - Harmful if swallowed
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
H330 - Fatal if inhaled
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H350 - May cause cancer
H351 - Suspected of causing cancer
H360Df - May damage the unborn child. Suspected of damaging fertility
H361fd - Suspected of damaging fertility. 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
EUH014 - Reacts violently with water

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration

PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadviser - LOLI, Merck index, RTECS

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (Volatile Organic Compound)

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards On basis of test data

Health Hazards Calculation method

Environmental hazards Calculation method

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Prepared By

Health, Safety and Environmental Department

Revision Date

17-Mar-2024

Revision Summary

New emergency telephone response service provider.

This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as

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amended.

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