



SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
Regulation (EC) No. 1907/2006 as amended by Regulation (EU) No. 2020/878, and
Regulation (EC) No. 1272/2008

Revision date 15-Aug-2025

Revision Number 1

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

1.1. Product identifier

Product Code(s) Lithium Batteries
Product Name Vertiv Liebert PSI5 Lithium-Ion Series, Vertiv Edge Lithium-Ion Series
Synonyms Li Batteries
Pure substance/mixture Mixture

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

Recommended use Uninterruptible Power Supply (UPS)
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Importer	Manufacturer
Vertiv S.r.l. Via Leonardo da Vinci, 16-18 Piove di Sacco, Padova, 35028 Italia	Vertiv Group Corporation 505 N Cleveland Ave Westerville, OH 43082

For further information, please contact

1.4. Emergency telephone number

Emergency telephone 0800 1155 4499 / 0800 296 837

Emergency telephone - §45 - (EC)1272/2008

Europe	112
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

As supplied, this product is an article. This product contains a battery. No exposure to hazardous chemicals is expected to occur during intended product use. Misuse of the product may result in exposure to hazardous chemicals. The information below relates to the mixture of components contained within the battery.

Hazardous to the aquatic environment - acute	Category 1 - (H400)
Hazardous to the aquatic environment - chronic	Category 2 - (H411)

2.2. Label elements



Signal word
Warning

Hazard statements

H400 - Very toxic to aquatic life.

H411 - Toxic to aquatic life with long lasting effects.

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

P273 - Avoid release to the environment.

P391 - Collect spillage.

P501 - Dispose of contents and container in accordance with local, regional, national, and international regulations as applicable.

Unknown aquatic toxicity Contains 64.14 % of components with unknown hazards to the aquatic environment.

2.3. Other hazards

Other hazards No information available.

PBT & vPvB None known.

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical name	Weight-%	REACH registration number	EC No. (Index No.)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)	Notes
Graphite 7782-42-5	10-15	No data available	231-955-3	[C]	-	-	-	-
Copper 7440-50-8	7-13	No data available	231-159-6 (029-026-00-0)	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	-	10	1	-
Aluminum 7429-90-5	5-10	No data available	231-072-3 (013-002-00-1)	Flam. Sol. 1 (H228) Water-react. 2 (H261)	-	-	-	T
Polypropylene 9003-07-0	3-7	No data available	-	[C]	-	-	-	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	1-5	No data available	244-334-7	[C]	-	-	-	-
Poly(oxy-1,2-ethaned	1-3	No data	-	[C]	-	-	-	-

iyloxy carbonyl-1,4-ph enylene carbonyl) 25038-59-9		available						
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Classification according to Regulation (EC) No. 1272/2008 [CLP] - Notes

[C] - Components with occupational exposure limits and/or biological occupational exposure limits requiring monitoring

Note T - This substance may be marketed in a form which does not have the physical hazards as indicated by the classification in the entry in Part 3. If the results of the relevant method or methods in accordance with Part 2 of Annex I of this Regulation show that the specific form of substance marketed does not exhibit this physical property or these physical hazards, the substance shall be classified in accordance with the result or results of this test or these tests. Relevant information, including reference to the relevant test method(s) shall be included in the safety data sheet.

Full text of H- and EUH-phrases: see section 16

Acute Toxicity Estimate

If LD50/LC50 data is not available or does not correspond to the classification category, then the appropriate conversion value from CLP Annex I, Table 3.1.2, is used to calculate the acute toxicity estimate (ATEmix) for classifying a mixture based on its components

Chemical name	Oral LD50 mg/kg	Dermal LD50 mg/kg	Inhalation LC50 - 4 hour - dust/mist - mg/L	Inhalation LC50 - 4 hour - vapour - mg/L	Inhalation LC50 - 4 hour - gas - ppm
Graphite 7782-42-5	No data available	No data available	2.002	No data available	No data available
Copper 7440-50-8	No data available	No data available	5.1151	No data available	No data available
Aluminum 7429-90-5	No data available	No data available	0.8889	No data available	No data available

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	If contents are released: Remove to fresh air.
Eye contact	If contents are released: Rinse thoroughly with plenty of water, also under the eyelids.
Skin contact	If contents are released: Wash with plenty of water.
Ingestion	If contents are released: Rinse mouth. Get medical attention.

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

Symptoms	None known.
Effects of Exposure	None known.

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

Note to doctors	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.

Unsuitable extinguishing media No information available.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical No information available.

Hazardous combustion products Carbon monoxide. Carbon dioxide (CO₂). Lithium oxides.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Dispose of wastes in an approved waste disposal facility.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

General hygiene considerations Wash hands before breaks and after work. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep in a dry, cool and well-ventilated place.

Storage class (TRGS 510) LGK 11.

7.3. Specific end use(s)

Specific use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union	Austria	Belgium	Bulgaria	Croatia
Graphite 7782-42-5	-	TWA-TMW: 5 mg/m ³ ; alveolar dust, respirable fraction STEL-KZGW: 10 mg/m ³ (2 X 60 min); alveolar dust with <1% Quartz, respirable fraction	TWA: 2 mg/m ³ ; alveolar fraction	TWA: 5.0 mg/m ³ ; inhalable fraction	TWA-GVI: 4 mg/m ³ ; respirable dust TWA-GVI: 10 mg/m ³ ; total dust, inhalable particles
Copper 7440-50-8	-	TWA-TMW: 1 mg/m ³ ; inhalable fraction TWA-TMW: 0.1 mg/m ³ ; respirable fraction, smoke STEL-KZGW: 4 mg/m ³ (4 X 15 min); inhalable fraction STEL-KZGW: 0.4 mg/m ³ (4 X 15 min); respirable fraction, smoke	TWA: 0.2 mg/m ³ ; fume TWA: 1 mg/m ³ ; dust and mist	TWA: 0.1 mg/m ³ ; metal vapor	TWA-GVI: 0.2 mg/m ³ ; fume TWA-GVI: 1 mg/m ³ ; dust STEL-KGVI: 2 mg/m ³ ; dust
Aluminum 7429-90-5	-	TWA-TMW: 10 mg/m ³ ; inhalable fraction STEL-KZGW: 20 mg/m ³ (2 X 60 min); inhalable fraction	TWA: 1 mg/m ³ ;	TWA: 10.0 mg/m ³ ; inhalable fraction TWA: 1.5 mg/m ³ ; respirable fraction	TWA-GVI: 10 mg/m ³ ; total dust, inhalable particles TWA-GVI: 4 mg/m ³ ; respirable dust
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Graphite 7782-42-5	-	TWA: 2.0 mg/m ³ ; dust, respirable fraction	TWA: 2.5 mg/m ³ ; respirable STEL: 5 mg/m ³ ; respirable	TWA: 5 mg/m ³ ; total dust	TWA: 2 mg/m ³ ;
Copper 7440-50-8	-	TWA: 1 mg/m ³ ; dust TWA: 0.1 mg/m ³ ; fume Ceiling: 2 mg/m ³ ; dust Ceiling: 0.2 mg/m ³ ; fume	TWA: 1.0 mg/m ³ ; dust and powder TWA: 0.1 mg/m ³ ; fume STEL: 2 mg/m ³ ; dust and powder STEL: 0.2 mg/m ³ ; fume	TWA: 1 mg/m ³ ; total dust TWA: 0.2 mg/m ³ ; respirable dust	TWA: 0.02 mg/m ³ ; respirable dust
Aluminum 7429-90-5	-	TWA: 10.0 mg/m ³ ; dust	TWA: 5 mg/m ³ ; total, dust and powder TWA: 2 mg/m ³ ; respirable, dust and	TWA: 10 mg/m ³ ; total dust TWA: 4 mg/m ³ ; respirable dust	TWA: 1.5 mg/m ³ ;

			powder STEL: 10 mg/m ³ ; total, dust and powder STEL: 4 mg/m ³ ; respirable, dust and powder		
Polypropylene 9003-07-0	-	TWA: 5 mg/m ³ ; dust	-	-	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	-	TWA: 2.5 mg/m ³ ; STEL: 5 mg/m ³ ;	TWA: 2.5 mg/m ³ ;	-
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Graphite 7782-42-5	TWA-VME: 2 mg/m ³ ; alveolar fraction	TWA-AGW; 1.25 mg/m ³ (exposure factor 2); respirable fraction TWA-AGW; 10 mg/m ³ (exposure factor 2); inhalable fraction	TWA-MAK: 0.3 mg/m ³ ; II(8);respirab le fraction TWA-MAK: 4 mg/m ³ ; ;inhalable fraction Peak: 2.4 mg/m ³ ;	TWA: 10 mg/m ³ ; inhalable fraction TWA: 5 mg/m ³ ; respirable fraction	TWA-AK: 5 mg/m ³ ; inhalable concentration TWA-AK: 2 mg/m ³ ; respirable concentration
Copper 7440-50-8	TWA-VME: 0.2 mg/m ³ ; fume TWA-VME: 1 mg/m ³ ; dust STEL-VLCT: 2 mg/m ³ ; dust	-	TWA-MAK: 0.01 mg/m ³ ; II(2);respirab le fraction Peak: 0.02 mg/m ³ ; respirable fraction	TWA: 0.2 mg/m ³ ; fume TWA: 1 mg/m ³ ; dust STEL: 2 mg/m ³ ; dust	TWA-AK: 0.1 mg/m ³ ; TWA-AK: 0.01 mg/m ³ ; fume; respirable fraction STEL-CK: 0.2 mg/m ³ ;
Aluminum 7429-90-5	TWA-VME: 10 mg/m ³ ; TWA-VME: 5 mg/m ³ ; dust	TWA-AGW; 1.25 mg/m ³ (exposure factor 2); respirable fraction TWA-AGW; 10 mg/m ³ (exposure factor 2); inhalable fraction	TWA-MAK: 0.5 mg/m ³ ; II(8);dust, inhalable fraction TWA-MAK: 0.05 mg/m ³ ; II(8);dust, respirable fraction Peak: 0.4 mg/m ³ ; respirable fraction Peak: 4 mg/m ³ ; inhalable fraction	TWA: 10 mg/m ³ ; inhalable fraction TWA: 5 mg/m ³ ; respirable fraction	TWA-AK: 1 mg/m ³ ; respirable fraction
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	TWA-AGW; 1 mg/m ³ (exposure factor 4); inhalable fraction	TWA-MAK: 1 mg/m ³ ; II(4);inhalabl e fraction Sk	TWA: 2.5 mg/m ³ ;	TWA-AK: 2.5 mg/m ³ ; pSk
Poly(oxy-1,2-ethanediyl- oxycarbonyl-1,4-phenylene carbonyl) 25038-59-9	-	TWA-AGW; 1.25 mg/m ³ (exposure factor 2); respirable fraction TWA-AGW; 10 mg/m ³ (exposure factor 2); inhalable fraction	-	-	-
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Graphite 7782-42-5	TWA: 2 mg/m ³ ; all forms except fibres; respirable fraction STEL: 6 mg/m ³ (calculated); all forms except fibres; respirable fraction	-	TWA: 2 mg/m ³ ; respirable fraction	TWA: 2 mg/m ³ ;	TWA-IPRD: 5 mg/m ³ ; dust

Copper 7440-50-8	TWA: 0.2 mg/m ³ ; fume TWA: 1 mg/m ³ ; dusts and mists STEL: 2 mg/m ³ ; dusts and mists STEL: 0.6 mg/m ³ (calculated); fume	-	TWA: 0.2 mg/m ³ ; fume	TWA: 0.5 mg/m ³ ; STEL: 1 mg/m ³ ;	TWA-IPRD: 1 mg/m ³ ; inhalable fraction TWA-IPRD: 0.2 mg/m ³ ; respirable fraction
Aluminum 7429-90-5	TWA: 1 mg/m ³ ; respirable fraction STEL: 3 mg/m ³ (calculated); respirable dust	-	TWA: 1 mg/m ³ ; respirable fraction	TWA: 2 mg/m ³ ;	TWA-IPRD: 5 mg/m ³ ; inhalable fraction TWA-IPRD: 2 mg/m ³ ; respirable fraction TWA-IPRD: 1 mg/m ³ ;
Polypropylene 9003-07-0	-	-	-	TWA: 5 mg/m ³ ; dust	TWA-IPRD: 10 mg/m ³ ;
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA: 2.5 mg/m ³ ; STEL: 7.5 mg/m ³ (calculated);	-	TWA: 2.5 mg/m ³ ;	-	TWA-IPRD: 2.5 mg/m ³ ;
Poly(oxy-1,2-ethanediyl oxycarbonyl-1,4-phenylene carbonyl) 25038-59-9	-	-	-	TWA: 5 mg/m ³ ;	TWA-IPRD: 5 mg/m ³ ;
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Graphite 7782-42-5	-	-	-	TWA: 5 mg/m ³ ; total dust TWA: 2 mg/m ³ ; respirable dust TWA: 10 mg/m ³ ; total dust TWA: 4 mg/m ³ ; respirable dust STEL: 10 mg/m ³ (natural; value calculated); total dust STEL: 4 mg/m ³ (natural; value calculated); respirable dust STEL: 20 mg/m ³ (synthetic; value calculated); total dust STEL: 8 mg/m ³ (synthetic; value calculated); respirable dust	TWA-NDS: 4.0 mg/m ³ ; inhalable fraction TWA-NDS: 1.0 mg/m ³ ; respirable fraction TWA-NDS: 6 mg/m ³ ; inhalable fraction
Copper 7440-50-8	-	-	TWA: 0.1 mg/m ³ ; inhalable	TWA: 0.1 mg/m ³ ; fume TWA: 1 mg/m ³ ; dust STEL: 3 mg/m ³ (value calculated); dust STEL: 0.3 mg/m ³ (value	TWA-NDS: 0.2 mg/m ³ ;

				calculated); fume	
Aluminum 7429-90-5	-	-	-	TWA: 5 mg/m ³ ; powder STEL: 10 mg/m ³ (pyrotechnical; value calculated); powder	TWA-NDS: 2.5 mg/m ³ ; inhalable fraction TWA-NDS: 1.2 mg/m ³ ; respirable fraction
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	-	-	-	TWA-NDS: 2 mg/m ³ ;
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Graphite 7782-42-5	TWA (VLE-MP): 2 mg/m ³ ; respirable fraction	TWA: 2 mg/m ³ ; dust, respirable fraction	TWA: 10 mg/m ³ ; total aerosol TWA: 2 mg/m ³ ; respirable fraction Ceiling: 10 mg/m ³ ; solid aerosol	-	TWA-(VLA-ED): 2 mg/m ³ ; dust; respirable fraction
Copper 7440-50-8	TWA (VLE-MP): 0.2 mg/m ³ ; fume TWA (VLE-MP): 1 mg/m ³ ; dust; mist	TWA: 0.5 mg/m ³ ; dust STEL: 0.2 mg/m ³ ; fume STEL: 1.5 mg/m ³ ; dust	TWA: 1 mg/m ³ ; inhalable fraction TWA: 0.2 mg/m ³ ; respirable fraction	-	TWA-(VLA-ED): 0.01 mg/m ³ ; respirable fraction
Aluminum 7429-90-5	TWA (VLE-MP): 1 mg/m ³ ; respirable fraction	TWA: 3 mg/m ³ ; dust TWA: 1 mg/m ³ ; fume STEL: 10 mg/m ³ ; dust STEL: 3 mg/m ³ ; fume	TWA: 4 mg/m ³ ; inhalable dust TWA: 1.5 mg/m ³ ; respirable dust	-	TWA-(VLA-ED): 1 mg/m ³ ; respirable fraction
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TWA (VLE-MP): 2.5 mg/m ³ ;	-	TWA: 2.5 mg/m ³ ;	-	-
Chemical name	Sweden		Switzerland		United Kingdom
Graphite 7782-42-5	-		TWA-MAK: 3 mg/m ³ ; respirable dust TWA-MAK: 10 mg/m ³ ; inhalable dust		TWA: 10 mg/m ³ ; inhalable dust TWA: 4 mg/m ³ ; respirable dust STEL: 30 mg/m ³ ; inhalable dust STEL: 12 mg/m ³ ; respirable dust
Copper 7440-50-8	TLV-NGV: 0.01 mg/m ³ ; respirable fraction		TWA-MAK: 0.1 mg/m ³ ; inhalable dust STEL-KZGW: 0.2 mg/m ³ ; inhalable dust		TWA: 1 mg/m ³ ; dust and mist TWA: 0.2 mg/m ³ ; fume STEL: 0.6 mg/m ³ ; fume STEL: 2 mg/m ³ ; dust and mist
Aluminum 7429-90-5	TLV-NGV: 5 mg/m ³ ; total dust TLV-NGV: 2 mg/m ³ ; respirable fraction		TWA-MAK: 3 mg/m ³ ; respirable dust TWA-MAK: 10 mg/m ³ ; inhalable dust		TWA: 10 mg/m ³ ; inhalable dust TWA: 4 mg/m ³ ; respirable dust STEL: 30 mg/m ³ ; inhalable dust STEL: 12 mg/m ³ ; respirable dust
Phosphate(1-), hexafluoro-, lithium 21324-40-3	TLV-NGV: 2 mg/m ³ ;		-		-

Note See section 16 for terms and abbreviations

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
Aluminum 7429-90-5	-	60 µg/g Creatinine (urine - Aluminum after end of work day, at the end of a work week/end of	-	200 µg/L - urine (Aluminum) - at the end of the work shift	-

		the shift)			
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
Aluminum 7429-90-5	-	-	-	50 µg/g Creatinine (urine - Aluminum at the end of the shift, in case of long-term exposure after several previous shifts) 50 µg/g Creatinine - BAT (for long-term exposures: at the end of the shift after several shifts) urine 15 µg/g Creatinine - BAR (for long-term exposures: at the end of the shift after several shifts) urine	50 µg/g Creatinine (urine - Aluminum at the end of the shift, in case of long-term exposure after several previous shifts)
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	-	- urine (Fluorides) - beginning of shift - urine (Fluorides) - end of shift	-	-
Chemical name	Hungary	Ireland	Italy MDLPS	Italy AIDII	
Phosphate(1-), hexafluoro-, lithium 21324-40-3	7 mg/g Creatinine (urine - Fluoride end of shift) 4 mg/g Creatinine (urine - Fluoride prior to next shift) 42 µmol/mmol Creatinine (urine - Fluoride end of shift) 24 µmol/mmol Creatinine (urine - Fluoride prior to next shift)	-	-	2 mg/g Creatinine - urine (Fluorides) - prior to shift 3 mg/g Creatinine - urine (Fluorides) - end of shift	
Chemical name	Latvia	Luxembourg	Romania	Slovakia	
Aluminum 7429-90-5	50 µg/g Creatinine - urine (Aluminum) - end of shift	-	200 µg/L - urine (Aluminum) - end of shift	60 µg/g creatinine (urine - Aluminum not critical)	
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	-	5 mg/g Creatinine - urine (Fluorine) - end of shift	-	
Chemical name	Slovenia	Spain	Switzerland	United Kingdom	
Aluminum 7429-90-5	50 µg/L - urine (Aluminum) - for long-term exposure: at the end of the work shift after several consecutive workdays	-	50 µg/g creatinine (urine - Aluminum after several shifts (for long-term exposures)) 0.21 µmol/mmol creatinine (urine - Aluminum after several shifts (for long-term exposures))	-	

Note 1: Details about BEL values can be found in Annex 2 of the Austrian Ordinance on Health Monitoring in the Workplace.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
Graphite 7782-42-5	-	-	0.14 mg/m³ [5] [6] 0.26 mg/m³ [5] [7]

Chemical name	Oral	Dermal	Inhalation
Copper 7440-50-8	-	137 mg/kg bw/day [4] [6] 273 mg/kg bw/day [4] [7]	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	-	133 µg/kg bw/day [4] [6]	0.931 mg/m³ [4] [6]

Notes

[4]	Systemic health effects.
[5]	Local health effects.
[6]	Long term.
[7]	Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
Graphite 7782-42-5	-	-	0.025 mg/m³ [5] [6] 0.13 mg/m³ [5] [7]
Copper 7440-50-8	-	273 mg/kg bw/day [4] [6] 273 mg/kg bw/day [4] [7]	-

Notes

[4]	Systemic health effects.
[5]	Local health effects.
[6]	Long term.
[7]	Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
Graphite 7782-42-5	0.78 mg/L	1.9 mg/L	0.078 mg/L	1.9 mg/L	-
Copper 7440-50-8	6.3 µg/L	-	5.2 µg/L	-	-
Aluminum 7429-90-5	74.9 µg/L	-	-	-	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	0.31 mg/L	0.68 mg/L	0.031 mg/L	-	-

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
Graphite 7782-42-5	-	-	50 mg/L	-	-
Copper 7440-50-8	87 mg/kg sediment dw	676 mg/kg sediment dw	230 µg/L	65 mg/kg soil dw	-
Aluminum 7429-90-5	-	-	20 mg/L	-	-
Phosphate(1-), hexafluoro-, lithium 21324-40-3	7.73 mg/kg sediment dw	1.55 mg/kg sediment dw	48 mg/L	13.5 mg/kg soil dw	-

8.2. Exposure controls

Engineering controls	Showers Eyewash stations Ventilation systems.
Personal protective equipment	
Eye/face protection	No special protective equipment required.
Hand protection	No special protective equipment required.
Skin and body protection	No special protective equipment required.
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
Environmental exposure controls	No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Solid containing liquid
Physical state	Solid
Colour	Varies
Odour	No information available
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point		No data available
Boiling point or initial boiling point and boiling range		No data available
Flammability		No data available
Lower and upper explosion limit/flammability limit		
Lower explosion limit		No data available
Upper explosion limit		No data available
Flash point		No data available
Autoignition temperature		No data available
Decomposition temperature		No data available
SADT (°C)		No data available
pH		No data available
pH (as aqueous solution)		No data available
Kinematic viscosity		No data available
Dynamic viscosity		No data available
Water solubility		No data available
Solubility		No data available
Partition coefficient n-octanol/water (log value)		No data available
Vapour pressure		No data available
Density and/or relative density		No data available
Bulk density		No data available
Liquid Density		No data available
Relative vapour density		No data available
Particle characteristics		
Particle Size		No data available
Particle Size Distribution		No data available

9.2. Other information

Molecular weight	No information available
VOC content	0.0%
Softening point	No information available

9.2.1. Information with regards to physical hazard classes

Explosives

Explosive properties	No information available
Oxidising properties	No information available

9.2.2. Other safety characteristics

No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	None under normal use conditions.
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10.2. Chemical stability

Stability	Stable under normal conditions.
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Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	None under normal processing.
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10.4. Conditions to avoid

Conditions to avoid	None known based on information supplied.
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10.5. Incompatible materials

Incompatible materials	None known based on information supplied.
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10.6. Hazardous decomposition products

Hazardous decomposition products	None known based on information supplied.
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SECTION 11: Toxicological information

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

Information on likely routes of exposure

Product Information

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Inhalation Specific test data for the substance or mixture is not available.

Eye contact Specific test data for the substance or mixture is not available.

Skin contact When used as directed and under normal conditions, no exposure to hazardous components is expected. If contents are released:

Ingestion

Specific test data for the substance or mixture is not available.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms

None known.

Acute toxicity

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

Numerical measures of toxicity

The following ATE values have been calculated for the mixture:

ATEmix (dermal) 2,737.90 mg/kg
ATEmix (inhalation-dust/mist) 18.7261 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Graphite	-	-	> 2000 mg/m ³ (Rat) 4 h
Copper	-	-	> 5.11 mg/L (Rat) 4 h
Aluminum	-	-	> 0.888 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation

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

Serious eye damage/eye irritation

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

Respiratory or skin sensitisation

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

Germ cell mutagenicity

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

Carcinogenicity

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

Reproductive toxicity

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

STOT - single exposure

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

STOT - repeated exposure

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

Aspiration hazard

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

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disrupting properties

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

11.2.2. Other information

Other adverse effects

No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Unknown aquatic toxicity Contains 64.14 % of components with unknown hazards to the aquatic environment.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Graphite 7782-42-5	-	LC50: >100mg/L (96h, Danio rerio)	-	-
Copper 7440-50-8	EC50: 0.0426 - 0.0535mg/L (72h, Pseudokirchneriella subcapitata) EC50: 0.031 - 0.054mg/L (96h, Pseudokirchneriella subcapitata)	LC50: 0.0068 - 0.0156mg/L (96h, Pimephales promelas) LC50: <0.3mg/L (96h, Pimephales promelas) LC50: =0.2mg/L (96h, Pimephales promelas) LC50: =0.052mg/L (96h, Oncorhynchus mykiss) LC50: =1.25mg/L (96h, Lepomis macrochirus) LC50: =0.3mg/L (96h, Cyprinus carpio) LC50: =0.8mg/L (96h, Cyprinus carpio) LC50: =0.112mg/L (96h, Poecilia reticulata)	-	EC50: =0.03mg/L (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation No information available.

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment Based on available data, the classification criteria are not met.

Chemical name	PBT and vPvB assessment
Graphite 7782-42-5	Not PBT/vPvB
Copper 7440-50-8	Not PBT/vPvB
Aluminum 7429-90-5	Not PBT/vPvB
Phosphate(1-), hexafluoro-, lithium 21324-40-3	Not PBT/vPvB

12.6. Endocrine disrupting properties

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

12.7. Other adverse effects

Other adverse effects	No information available.
PMT or vPvM properties	Based on available data, the classification criteria are not met.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.
Waste codes / waste designations according to EWC / AVV	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

IATA	Forbidden for transport by Passenger Air.
Notes	Forbidden for transport by Passenger Air.
14.1 UN number or ID number	UN3480
14.2 UN proper shipping name	Lithium ion batteries
14.3 Transport hazard class(es)	9
14.4 Packing group	Not regulated
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	A88, A99, A154, A183, A201, A213, A331, A334, A802
ERG Code	12FZ
Description	UN3480, Lithium ion batteries, 9
IMDG	
14.1 UN number or ID number	UN3480
14.2 UN proper shipping name	Lithium ion batteries
14.3 Transport hazard class(es)	9
14.4 Packing group	Not regulated
14.5 Environmental hazards	Yes
Marine pollutant indicator	P
14.6 Special precautions for user	
Special Provisions	188, 230, 310, 348, 376, 377, 384, 387
EmS-No.	F-A, S-I
Description	UN3480, Lithium ion batteries, 9, Marine pollutant
14.7 Maritime transport in bulk according to IMO instruments	No information available
RID	
14.1 UN number or ID number	UN3480
14.2 UN proper shipping name	Lithium ion batteries
14.3 Transport hazard class(es)	9
14.4 Packing group	Not applicable
Description	UN3480, Lithium ion batteries, 9, Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	188, 230, 310, 348, 376, 377, 387, 636, 677
Classification code	M4

ADR

14.1 UN number or ID number	UN3480
14.2 UN proper shipping name	Lithium ion batteries
14.3 Transport hazard class(es)	9
14.4 Packing group	Not regulated
Description	UN3480, Lithium ion batteries, 9, (E), Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	188, 230, 310, 348, 376, 377, 387, 636, 677
Classification code	M4
Tunnel restriction code	(E)

ADN

14.1 UN number or ID number	UN3480
14.2 UN proper shipping name	Lithium ion batteries
14.3 Transport hazard class(es)	9
14.4 Packing group	Not applicable
Description	UN3480, Lithium ion batteries, 9, Environmentally Hazardous
14.5 Environmental hazard	Yes
14.6 Special precautions for user	
Special Provisions	188, 230, 310, 348, 376, 377, 387, 636, 677
Classification code	M4
Equipment Requirements	PP

SECTION 15: Regulatory information

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

National regulations

France

Occupational Illnesses (R-463-3, France)

Chemical name	French RG number
Graphite - 7782-42-5	RG 16 RG 25
Aluminum - 7429-90-5	RG 32 RG 16, RG 16bis
Polypropylene - 9003-07-0	RG 66

Germany

Water hazard class (WGK) obviously hazardous to water (WGK 2).

Chemical Prohibition Ordinance (ChemVerbotsV)

Not applicable.

TA Luft (German Air Pollution Control Regulation)

Chemical name	Number	Class
Copper	5.2.2	Class III
Phosphate(1-), hexafluoro-, lithium	5.2.4	Class II

TRGS 905 Not applicable.

Switzerland

Ordinance on the Incentive Tax on Volatile Organic Compounds (OVOC) SR 814.018 Not applicable.
Storage of Hazardous Material SC 11/13.
WPO (GSchV) SR 814.201; WPA (GSchG) SR 814.20 Not applicable.
Major Accidents Ordinance SR 814.012 Not applicable.

European Union

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

Authorisations and/or restrictions on use:

This product contains one or more substance(s) subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Copper - 7440-50-8	75	-
Aluminum - 7429-90-5	75	-

Persistent Organic Pollutants

Not applicable.

Dangerous substance category per Seveso Directive (2012/18/EU)

E1 - Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1. E2 - Hazardous to the Aquatic Environment in Category Chronic 2.

Ozone-depleting substances (ODS) regulation (EC) 2024/590

Not applicable.

Biocidal Products Regulation (EU) No 528/2012 (BPR)

Chemical name	Biocidal Products Regulation (EU) No 528/2012 (BPR)
Copper - 7440-50-8	Product-type 8: Wood preservatives Product-type 21: Antifouling products

Explosives Precursors Marketing and Use (2019/1148)

This product is regulated by Regulation (EU) 2019/1148: all suspicious transactions, and significant disappearances and thefts should be reported to the relevant national contact point. Please see https://home-affairs.ec.europa.eu/policies/internal-security/counter-terrorism-and-radicalisation/protection/legislation-chemicals-use-d-home-made-explosives_en.

Chemical name	Limit value	Upper limit value for the purpose of licensing under article 5(3)	Reportable explosives precursors
Aluminum 7429-90-5	-	-	Present

International Inventories

Contact supplier for inventory compliance status

15.2. Chemical safety assessment

Chemical Safety Report

No information available.

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of any hazard and/or precautionary statements referred to under Sections 2-15

H228 - Flammable solid

H261 - In contact with water releases flammable gases

H400 - Very toxic to aquatic life

H410 - Very toxic to aquatic life with long lasting effects

P273 - Avoid release to the environment

P391 - Collect spillage

P501 - Dispose of contents and container in accordance with local, regional, national, and international regulations as applicable

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
AIDII	Italian Association of Industrial Hygienists
ADN	Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Europe)
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road (Europe)
AIIC	Australian Inventory of Industrial Chemicals
ATE	Acute Toxicity Estimate
ASTM	American Society for the Testing of Materials
bar	Biological Reference Values for Chemical Compounds in the Work Area
BAT	Biological tolerance values for occupational exposure
BEL	Biological exposure limits
bw	Body weight
Ceiling	Maximum limit value
CLP	Classification, Labelling and Packaging Regulation; Regulation (EC) No 1272/2008
CMR	Carcinogen, Mutagen or Reproductive Toxicant
DFG	German Research Foundation
DOT	Department of Transportation (United States)
DSL	Domestic Substances List (Canada)
ECHA	European Chemicals Agency
EC Number	European Community number
EmS	Emergency Schedule
ENCS	Existing and New Chemical Substances (Japan)
EPA	U.S. Environmental Protection Agency
EWC	European Waste Codes
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
ICAO	International Civil Aviation Organisation
IECSC	Inventory of Existing Chemical Substances in China
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Organisation for Standardisation
KECI	Korean Existing Chemicals Inventory
LC50	Lethal Concentration to 50% of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
MAK	Maximum Concentration at the Workplace
MAL	Measuring Technical Hygienic Air Needs
MARPOL	International Convention for the Prevention of Pollution from Ships

MDLPS	Ministry of Labour and Social Policy
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOELR	No Observable Effect Loading Rate
NZIoC	New Zealand Inventory of Chemicals
OECD	Organization for Economic Cooperation and Development
OEL	Occupational exposure limits
PBT	Persistent, Bioaccumulative and Toxic substance
PICCS	Philippines Inventory of Chemicals and Chemical Substances
PMT	Persistent, Mobile and Toxic
PPE	Personal protective equipment
QSAR	Quantitative Structure Activity Relationship
REACH	Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) Regulation (EC 1907/2006)
RID	Agreement concerning the International Carriage of Dangerous Goods by Rail (Europe)
SADT	Self-Accelerating Decomposition Temperature
SAR	Structure-activity relationship
SDS	Safety Data Sheet
SL	Surface Limit
STEL	Short Term Exposure Limit
STOT RE	Specific target organ toxicity - Repeated exposure
STOT SE	Specific target organ toxicity - Single exposure
SVHC	Substance of very high concern
TCSI	Taiwan Chemical Substance Inventory
TDG	Transport of Dangerous Goods (Canada)
TRGS	Technical Rule for Hazardous Substances
TSCA	Toxic Substances Control Act (United States)
TWA	Time-Weighted Average
UN	United Nations
VOC	Volatile organic compounds
vPvB	Very Persistent and Very Bioaccumulative
vPvM	Very Persistent and Very Mobile
As	Allergenic substance
DS	Dermal Sensitizer
Ot	Ototoxicant
pOt	Ototoxicant - potential to cause hearing disorders
PS	Photosensitizer
RS	Respiratory Sensitizer
S	Sensitizer
poS	Sensitizer - capable of causing occupational asthma
Sa	Simple asphyxiant
Sd	Skin designation
pSd	Skin designation - potential for cutaneous absorption
Sdv	Skin designation - vacated
Sk	Skin notation
dSk	Skin notation - danger of cutaneous absorption
pSk	Skin notation - potential for cutaneous absorption

Classification procedure	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method

Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Chronic aquatic toxicity	Calculation method
Acute aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

U.S. Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
U.S. Environmental Protection Agency
Acute Exposure Guideline Level(s) (AELG(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
International Organization for Economic Co-operation and Development (OECD) Environment, Health, and Safety Publications
International Organization for Economic Co-operation and Development (OECD) High Production Volume Chemicals Program
International Organization for Economic Co-operation and Development (OECD) Screening Information Data Set
United Nations World Health Organization (WHO)

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Disclaimer

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End of Safety Data Sheet