



SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008

Revision date 29-Apr-2024

Revision Number 1

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

1.1. Product identifier

Product Code(s) 5190-9418
Product Name Quality Control Standard 27 in 5% HNO₃, tr. HF
Form Not applicable
Pure substance/mixture Mixture

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

Recommended use Reagents and Standards for Analytical Chemical Laboratory Use
Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Supplier

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom

+44 (0) 345 712 5292

For further information, please contact

E-mail address pdl-msds_author@agilent.com

1.4. Emergency telephone number

Emergency Telephone CHEMTREC®: +(44)-870-8200418

Emergency Telephone - §45 - (EC)1272/2008	
Europe	112
Austria	No information available
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
France	
Hungary	

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Ireland	
Italy	
Lithuania	
Luxembourg	
Netherlands	
Norway	
Portugal	
Romania	
Slovakia	
Slovenia	
Spain	
Sweden	
Switzerland	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Skin corrosion/irritation	Category 2 - (H315)
Serious eye damage/eye irritation	Category 1 - (H318)
Chronic aquatic toxicity	Category 1 - (H410)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements

Contains Nitric Acid



Signal word
Danger

Hazard statements

H315 - Causes skin irritation
H318 - Causes serious eye damage
H410 - Very toxic to aquatic life with long lasting effects
H290 - May be corrosive to metals
EUH071 - Corrosive to the respiratory tract

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

P264 - Wash face, hands and any exposed skin thoroughly after handling

P273 - Avoid release to the environment

P280 - Wear protective gloves and eye/face protection

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor

P406 - Store in corrosive resistant stainless steel container with a resistant inner liner

2.3. Other hazards

Toxic to aquatic life.

This mixture contains no substance considered to be persistent, bioaccumulating or toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

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

Chemical name	EU - REACH (1907/2006) - Article 59(1) - Candidate List of Substances of Very High Concern (SVHC) for Authorisation	EU - REACH (1907/2006) - Endocrine Disruptor Assessment List of Substances
Nitric Acid	-	-
hydrofluoric acid	-	-
Zink (stabilized)	-	-
vanadium pentoxide	-	-
Titanium	-	-
Thallium	-	-
Silver	-	-
Selenium	-	-
Nickel	-	-
Molybdenum	-	-
Manganese(II) nitrate hexahydrate	-	-
Lead	-	-
Ferric nitrate nonahydrate	-	-
Copper	-	-
Cobalt	-	-
Chromium (III) nitrate nonahydrate	-	-
Calcium carbonate	-	-
Cadmium	-	-
Boric acid	-	-
Beryllium Oxyacetate	-	-
Barium nitrate	-	-
Arsenic	-	-
Antimony	-	-
Ammonium silicofluoride	-	-

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Aluminum nitrate nonahydrate	-	-
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SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical nature aqueous solution.

Chemical name	Weight-%	REACH registration number	EC No (EU Index No)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
Nitric Acid 7697-37-2	3 - <5	-	231-714-2	Met. Corr. 1 (H290) Ox. Liq. 2 (H272) Acute Tox. 3 (H331) Skin Corr. 1A (H314) (EUH071)	Ox. Liq. 2 :: C>=99% Ox. Liq. 3 :: C>=65% Skin Corr. 1A :: C>=20% Skin Corr. 1B :: 5%<=C<20%		
hydrofluoric acid 7664-39-3	0.1 - 1	-	231-634-8 (009-002-00-6)	Acute Tox. 2 (H300) Acute Tox. 1 (H310) Acute Tox. 2 (H330) Skin Corr. 1A (H314)	Eye Irrit. 2 :: 0.1%<=C<1% Skin Corr. 1A :: C>=7% Skin Corr. 1B :: 1%<=C<7%		
Zink (stabilized) 7440-66-6	<0.1	-	231-175-3	Acute. Tox. 4 (H302) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
vanadium pentoxide 1314-62-1	<0.1	-	215-239-8 (023-001-00-8)	Acute Tox. 2 (H300) Acute Tox. 2 (H330) Carc. 1B (H350) Muta. 2 (H341) Repr. 2 (H361fd) Lact. (H362) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Chronic 2 (H411)			

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Titanium 7440-32-6	<0.1	-	231-142-3	Flam. Sol. 1 (H228)			
Thallium 7440-28-0	<0.1	-	231-138-1 (081-001-00-3)	Acute Tox. 2 (H300) Acute Tox. 2 (H330) STOT RE 2 (H373) Aquatic Chronic 4 (H413)			
Silver 7440-22-4	<0.1	-	231-131-3	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Selenium 7782-49-2	<0.1	-	231-957-4	Acute Tox. 3 (H301) Acute Tox. 3 (H331) STOT RE 2 (H373) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Nickel 7440-02-0	<0.1	-	231-111-4 (028-002-00-7)	Skin Sens. 1 (H317) Carc. 2 (H351) STOT RE 1 (H372) Aquatic Chronic 3 (H412)			
Molybdenum 7439-98-7	<0.1	-	231-107-2	-			
Manganese(II) nitrate hexahydrate 17141-63-8	<0.1	-	627-048-0	Ox. Sol. 3 (H272) Skin Corr. 1B (H314) Eye Dam. 1 (H318) STOT RE 2 (H373)			
Lead 7439-92-1	<0.1	-	231-100-4 (082-014-00-7)	Carc. 2 (H351) Repr. 1A (H360FD) Lact. (H362) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	Repr. 1A :: C>=0.03%	1	10
Ferric nitrate nonahydrate 7782-61-8	<0.1	-	616-509-1	Ox. Sol. 2 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319)			
Copper 7440-50-8	<0.1	-	231-159-6	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Cobalt 7440-48-4	<0.1	-	231-158-0 (027-001-00)	Acute Tox. 4 (H302) Eye Irrit. 2 (H319)			

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			-9)	Resp. Sens. 1 (H334) Skin Sens. 1 (H317) Muta. 2 (H341) Carc. 1B (H350) Repr. 1B (H360F) Aquatic Chronic 2 (H411) EUH071 EUH201			
Chromium (III) nitrate nonahydrate 7789-02-8	<0.1	-	616-540-0	Ox. Sol. 3 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Aquatic Chronic 3 (H412)			
Calcium carbonate 471-34-1	<0.1	-	207-439-9	-			
Cadmium 7440-43-9	<0.1	-	231-152-8 (048-002-00-0)	Acute Tox. 4 (H302) 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)			
Boric acid 10043-35-3	<0.1	-	233-139-2	Repr. 1B (H360FD)			
Beryllium Oxyacetate 19049-40-2	<0.1	-	242-785-4 (004-002-00-2)	Acute Tox. 2 (H330) Acute Tox. 3 (H301) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Skin Sens. 1 (H317) Carc. 1B (H350) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Chronic 2 (H411)			
Barium nitrate 10022-31-8	<0.1	-	233-020-5 (056-002-00-7)	Ox. Sol. 2 (H272) Acute Tox. 4 (H302) Acute Tox. 4 (H332) Eye Irrit. 2 (H319)			
Arsenic 7440-38-2	<0.1	-	231-148-6 (033-001-00)	Acute Tox. 3 (H301) Acute Tox. 3 (H331)			

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			-X)	Carc. 1A (H350) Repr. 1A (H360) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
Antimony 7440-36-0	<0.1	-	231-146-5	Carc. 2 (H351) STOT RE 2 (H373)			
Ammonium silicofluoride 16919-19-0	<0.1	-	240-968-3 (009-012-00 -0)	Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) Eye Irrit. 2 (H319) Aquatic Chronic 3 (H412)			
Aluminum nitrate nonahydrate 7784-27-2	<0.1	-	616-523-8	Ox. Sol. 3 (H272) Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Dam. 1 (H318)			

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
Nitric Acid 7697-37-2	No data available	No data available	No data available	2.65	No data available
hydrofluoric acid 7664-39-3	No data available	No data available	No data available	No data available	482.8875
Zink (stabilized) 7440-66-6	630	No data available	No data available	No data available	No data available
vanadium pentoxide 1314-62-1	220 + 10	2500	2.21	No data available	No data available
Silver 7440-22-4	5000	2000	5.16	No data available	No data available
Selenium 7782-49-2	6700	No data available	No data available	No data available	No data available
Nickel 7440-02-0	9000	No data available	No data available	No data available	No data available

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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
Molybdenum 7439-98-7	No data available	2000	No data available	No data available	No data available
Ferric nitrate nonahydrate 7782-61-8	3250	No data available	No data available	No data available	No data available
Cobalt 7440-48-4	6171	No data available	No data available	No data available	No data available
Chromium (III) nitrate nonahydrate 7789-02-8	3250	No data available	No data available	No data available	No data available
Calcium carbonate 471-34-1	6450	2000	3	No data available	No data available
Cadmium 7440-43-9	1140	No data available	No data available	No data available	No data available
Boric acid 10043-35-3	2660	2001	2.12	No data available	No data available
Barium nitrate 10022-31-8	355	No data available	1.1138	No data available	No data available
Arsenic 7440-38-2	15	No data available	No data available	No data available	No data available
Antimony 7440-36-0	100	No data available	No data available	No data available	No data available
Aluminum nitrate nonahydrate 7784-27-2	542.5	No data available	No data available	No data available	No data available

+ This value is the harmonised acute toxicity estimate (ATE) listed in CLP Annex VI, Part 3. This harmonised ATE value must be used when calculating the acute toxicity estimate (ATE_{mix}) for classifying a mixture containing the listed substance

Additional information

The concentration of the acid stated in this SDS is calculated as an absolute mass concentration (%w/v). This is less than the acid concentration stated on the product label and COA, which reflects a percent value of the commercially available concentrated aqueous form of the acid.

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

General advice

Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

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Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a doctor.
Self-protection of the first aider	Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8).

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

Symptoms Burning sensation.

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

Note to doctors Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical No information available.

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

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6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.

Other information Refer to protective measures listed in Sections 7 and 8.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

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 Take up mechanically, placing in appropriate containers for disposal.

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. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash it before reuse.

General hygiene considerations Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Wear suitable gloves and eye/face protection. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Please refer to the manufacturer's certificate for specific storage and transport temperature conditions. Store only in the original receptacle unless other advice is given on the CoA. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

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7.3. Specific end use(s)

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union	Austria	Belgium	Bulgaria	Croatia
Nitric Acid 7697-37-2	-	STEL 1 ppm STEL 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL 3 ppm STEL 2.5 mg/m ³ H*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
vanadium pentoxide 1314-62-1	-	TWA: 0.05 mg/m ³ STEL 0.25 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³
Titanium 7440-32-6	-	-	-	TWA: 1.0 mg/m ³	-
Thallium 7440-28-0	-	STEL 1 mg/m ³	TWA: 0.02 mg/m ³ Sk*	TWA: 0.05 mg/m ³	-
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL 0.1 mg/m ³ Ceiling: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Selenium 7782-49-2	-	TWA: 0.1 mg/m ³ STEL 0.3 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.1 mg/m ³
Nickel 7440-02-0	-	Sa+ Sh+	TWA: 1 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.5 mg/m ³ Skin Sensitisation
Molybdenum 7439-98-7	-	TWA: 10 mg/m ³ STEL 20 mg/m ³	TWA: 10 mg/m ³	TWA: 10.0 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	-	TWA: 0.2 mg/m ³ STEL 1.6 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.15 mg/m ³	TWA: 0.1 mg/m ³ STEL 0.4 mg/m ³	-	TWA: 0.05 mg/m ³	TWA: 0.15 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	-	-	TWA: 1 mg/m ³	TWA: 1.0 mg/m ³	TWA: 1 mg/m ³ STEL: 2 mg/m ³
Copper 7440-50-8	-	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³ STEL 4 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³

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Cobalt 7440-48-4	-	STEL 0.4 mg/m ³ Sk* Sa+ Sh+	TWA: 0.02 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Skin Sensitisation Respiratory Sensitisation
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	TWA: 0.5 mg/m ³	-	-
Calcium carbonate 471-34-1	-	-	TWA: 10 mg/m ³	TWA: 1.0 fiber/cm ³ TWA: 10 mg/m ³	TWA: 10 mg/m ³ TWA: 4 mg/m ³
Cadmium 7440-43-9	TWA: 0.001 mg/m ³	-	TWA: 0.01 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³
Boric acid 10043-35-3	-	-	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 5.0 mg/m ³	-
Beryllium Oxyacetate 19049-40-2	-	-	TWA: 0,00005 mg/m ³ STEL: 0.01 mg/m ³	-	TWA: 0.0006 mg/m ³ Sk* Skin Sensitisation
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL 2 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	-	-	TWA: 0.01 mg/m ³	-	TWA: 0.1 mg/m ³
Antimony 7440-36-0	-	TWA: 0.5 mg/m ³ STEL 5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	-	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³
Aluminum nitrate nonahydrate 7784-27-2	-	-	TWA: 2 mg/m ³	-	TWA: 2 mg/m ³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 mg/m ³ Ceiling: 2.5 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 0.5 ppm TWA: 1.3 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	STEL: 3.0 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	TWA: 1.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 2.5 mg/m ³ STEL: 3 ppm	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ iho*
vanadium pentoxide 1314-62-1	-	TWA: 0.05 mg/m ³ Ceiling: 0.1 mg/m ³	TWA: 0.03 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.02 mg/m ³
Thallium 7440-28-0	-	TWA: 0.1 mg/m ³ Sk* Ceiling: 0.5 mg/m ³	Sk*	-	TWA: 0.1 mg/m ³ Sk*
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Ceiling: 0.3 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.02 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³

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Selenium 7782-49-2	-	TWA: 0.1 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Nickel 7440-02-0	-	TWA: 0.5 mg/m ³ S+ Ceiling: 1 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.5 mg/m ³ S+	TWA: 0.01 mg/m ³
Molybdenum 7439-98-7	-	TWA: 5 mg/m ³ Ceiling: 25 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 0.5 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 1 mg/m ³ Ceiling: 2 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³ STEL: 0.4 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.02 mg/m ³
Lead 7439-92-1	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	-	-	TWA: 1 mg/m ³ STEL: 2 mg/m ³	-	TWA: 1 mg/m ³
Copper 7440-50-8	-	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³ Ceiling: 2 mg/m ³ Ceiling: 0.2 mg/m ³	TWA: 1.0 mg/m ³ TWA: 0.1 mg/m ³ STEL: 2 mg/m ³ STEL: 0.2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³	TWA: 0.02 mg/m ³
Cobalt 7440-48-4	-	TWA: 0.05 mg/m ³ S+ Ceiling: 0.1 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.02 mg/m ³	TWA: 0.05 mg/m ³ S+	TWA: 0.02 mg/m ³
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA: 0.5 mg/m ³ Ceiling: 1.5 mg/m ³	-	TWA: 2 mg/m ³	TWA: 0.5 mg/m ³
Calcium carbonate 471-34-1	-	TWA: 10.0 mg/m ³	-	TWA: 10 mg/m ³ TWA: 5 mg/m ³	-
Cadmium 7440-43-9	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³ Sk* Ceiling: 0.008 mg/m ³	TWA: 0.001 mg/m ³ STEL: 0.002 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.004 mg/m ³
Beryllium Oxyacetate 19049-40-2	-	TWA: 0.001 mg/m ³ Ceiling: 0.002 mg/m ³	TWA: 0.00002 mg/m ³ STEL: 0.00004 mg/m ³	-	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	-	TWA: 0.1 mg/m ³ Ceiling: 0.4 mg/m ³	TWA: 0.0028 mg/m ³ STEL: 0.0056 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.01 mg/m ³	TWA: 0.01 mg/m ³
Antimony 7440-36-0	-	TWA: 0.5 mg/m ³ Ceiling: 1.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ Ceiling: 5 mg/m ³	TWA: 2.5 mg/m ³ STEL: 5 mg/m ³ except those mentioned elsewhere in the list	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³

SAFETY DATA SHEET

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Revision date 29-Apr-2024

Revision Number 1

5190-9418 - Quality Control Standard 27 in 5% HNO₃, tr. HF

Aluminum nitrate nonahydrate 7784-27-2	-	-	TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³	-	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 2.6 mg/m ³ STEL: 1 ppm
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1 ppm TWA: 0.83 mg/m ³ H*	TWA: 1 ppm TWA: 0.83 mg/m ³ Peak: 2 ppm Peak: 1.66 mg/m ³ *	TWA: 3 ppm TWA: 2.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 2.5 mg/m ³ STEL: 3 ppm b*
Zink (stabilized) 7440-66-6	-	-	TWA: 0.1 mg/m ³ TWA: 2 mg/m ³ Peak: 0.4 mg/m ³ Peak: 4 mg/m ³	-	-
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³	TWA: 0.005 mg/m ³ TWA: 0.03 mg/m ³	TWA: 0.005 mg/m ³ Peak: 0.01 mg/m ³	TWA: 0.5 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.2 mg/m ³ sz+
Thallium 7440-28-0	TWA: 0.1 mg/m ³	-	-	TWA: 0.1 mg/m ³ Sk*	-
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ Peak: 0.8 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³
Selenium 7782-49-2	-	TWA: 0.05 mg/m ³	TWA: 0.02 mg/m ³ Peak: 0.16 mg/m ³ Sk*	TWA: 0.2 mg/m ³	-
Nickel 7440-02-0	TWA: 1 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.006 mg/m ³ Sh+	respiratory and skin sensitizer inhalable fraction, respiratory sensitization confirmed for water soluble Nickel compounds only	TWA: 1 mg/m ³	TWA: 0.01 mg/m ³ sz+
Molybdenum 7439-98-7	-	-	-	TWA: 15 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	-	TWA: 0.2 mg/m ³ TWA: 0.02 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.02 mg/m ³ Peak: 1.6 mg/m ³ Peak: 0.16 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.1 mg/m ³	-	TWA: 0.004 mg/m ³ Peak: 0.032 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.05 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	-	-	-	TWA: 1 mg/m ³ STEL: 2 mg/m ³	-
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	-	TWA: 0.01 mg/m ³ Peak: 0.02 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 0.1 mg/m ³ TWA: 0.01 mg/m ³ STEL: 0.2 mg/m ³

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Cobalt 7440-48-4	-	-	Sk* respiratory and skin sensitizer	TWA: 0.1 mg/m ³	TWA: 0.02 mg/m ³ SZ+
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA: 2 mg/m ³	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ TWA: 2 mg/m ³ STEL: 2 mg/m ³ SZ+
Calcium carbonate 471-34-1	TWA: 10 mg/m ³	-	-	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 10 mg/m ³
Cadmium 7440-43-9	TWA: 0.004 mg/m ³	TWA: 0.002 mg/m ³	Sk*	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³
Boric acid 10043-35-3	-	TWA: 0.5 mg/m ³	TWA: 10 mg/m ³ Peak: 10 mg/m ³	-	-
Beryllium Oxyacetate 19049-40-2	TWA: 0.0006 mg/m ³	-	-	TWA: 0.005 mg/m ³	TWA: 0.0006 mg/m ³ Sk*
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ Peak: 4 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	-	-	-	TWA: 0.1 mg/m ³	TWA: 0.01 mg/m ³ Sk*
Antimony 7440-36-0	TWA: 0.5 mg/m ³	-	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³ Sk*	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ Sk*
Aluminum nitrate nonahydrate 7784-27-2	TWA: 2 mg/m ³	-	-	TWA: 2 mg/m ³	-
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	TWA: 2 ppm TWA: 5.2 mg/m ³ STEL: 4 ppm STEL: 10.3 mg/m ³	TWA: 0.78 ppm TWA: 2 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.5 mg/m ³ TWA: 1.8 ppm STEL: 2.5 mg/m ³ STEL: 3 ppm Sk*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 0.5 ppm TWA: 0.4 mg/m ³ cute* Ceiling: 2 ppm Ceiling: 1.6 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	-	TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ Ceiling: 0.05 mg/m ³
Titanium 7440-32-6	-	-	-	TWA: 10 mg/m ³	-
Thallium 7440-28-0	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³ Sk*	-	TWA: 0.02 mg/m ³ Sk*	-	-
Silver 7440-22-4	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³

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Selenium 7782-49-2	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	-	TWA: 0.2 mg/m ³	-	TWA: 0.1 mg/m ³
Nickel 7440-02-0	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ Sens+	-	TWA: 1.5 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.5 mg/m ³ J+
Molybdenum 7439-98-7	TWA: 3 mg/m ³ STEL: 9 mg/m ³	-	TWA: 10 mg/m ³ TWA: 3 mg/m ³	-	TWA: 5 mg/m ³ TWA: 10 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³ STEL: 0.6 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.15 mg/m ³ STEL: 0.45 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.15 mg/m ³ TWA: 0.07 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	TWA: 1 mg/m ³ STEL: 2 mg/m ³	-	TWA: 1 mg/m ³	-	-
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³ STEL: 0.6 mg/m ³	-	TWA: 0.2 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³
Cobalt 7440-48-4	TWA: 0.02 mg/m ³ STEL: 0.3 mg/m ³ Sens+	-	TWA: 0.02 mg/m ³ senR+ senD+	TWA: 0.5 mg/m ³	TWA: 0.05 mg/m ³ J+
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	TWA: 0.003 mg/m ³ senR+ senD+	TWA: 2 mg/m ³	-
Calcium carbonate 471-34-1	TWA: 10 mg/m ³ TWA: 4 mg/m ³ STEL: 30 mg/m ³ STEL: 12 mg/m ³	-	-	TWA: 6 mg/m ³	-
Cadmium 7440-43-9	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³ STEL: 0.003 mg/m ³ STEL: 0.012 mg/m ³	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.01 mg/m ³	TWA: 0.001 mg/m ³	TWA: 0.004 mg/m ³
Boric acid 10043-35-3	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³
Beryllium Oxyacetate 19049-40-2	TWA: 0.0002 mg/m ³ STEL: 0.0006 mg/m ³ Sk* Sens+	-	TWA: 0.00005 mg/m ³	TWA: 0.001 mg/m ³	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ Sk*	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³	-	TWA: 0.01 mg/m ³	-	-
Antimony 7440-36-0	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	-	TWA: 0.5 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³

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Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³ STEL: 7.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 0.2 mg/m ³	TWA: 2.5 mg/m ³
Aluminum nitrate nonahydrate 7784-27-2	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	-	-	TWA: 1 mg/m ³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 0.5 ppm STEL: 1.3 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 4 ppm STEL: 10 mg/m ³	TWA: 1.4 mg/m ³ STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	STEL: 3 ppm STEL: 2.5 mg/m ³ TWA: 1.8 ppm TWA: 1.5 mg/m ³	STEL: 1.27 ppm STEL: 1 mg/m ³	TWA: 0.6 ppm TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ STEL: 1.8 ppm H*	STEL: 2 mg/m ³ TWA: 0.5 mg/m ³
vanadium pentoxide 1314-62-1	-	-	TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³	-	TWA: 0.05 mg/m ³
Titanium 7440-32-6	-	-	-	-	TWA: 10 mg/m ³ STEL: 30 mg/m ³
Thallium 7440-28-0	-	-	-	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³ Sk*	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Silver 7440-22-4	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.05 mg/m ³
Selenium 7782-49-2	-	-	-	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³ A+	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Nickel 7440-02-0	-	-	-	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³ A+	TWA: 0.25 mg/m ³
Molybdenum 7439-98-7	-	-	-	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 4 mg/m ³ STEL: 10 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	-	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³ STEL: 0.6 ppm STEL: 0.15 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.15 mg/m ³	-	TWA: 0.15 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.05 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	-	-	-	TWA: 1 mg/m ³ STEL: 3 mg/m ³	-
Copper 7440-50-8	-	-	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³ TWA: 1 mg/m ³ STEL: 3 mg/m ³ STEL: 0.3 mg/m ³	TWA: 0.2 mg/m ³
Cobalt	-	-	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³

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7440-48-4				STEL: 0.06 mg/m ³ A+	
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	TWA: 0.06 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³
Calcium carbonate 471-34-1	-	-	-	-	TWA: 10 mg/m ³
Cadmium 7440-43-9	-	-	TWA: 0.004 mg/m ³	TWA: 0.001 mg/m ³ STEL: 0.003 mg/m ³	TWA: 0.004 mg/m ³
Beryllium Oxyacetate 19049-40-2	-	-	Sk*	-	-
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	-	-	TWA: 0.28 µg/m ³	TWA: 0.005 mg/m ³ STEL: 0.015 mg/m ³ Sk*	TWA: 0.01 mg/m ³
Antimony 7440-36-0	-	-	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 0.5 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	-	-	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³	TWA: 2 mg/m ³
Aluminum nitrate nonahydrate 7784-27-2	-	-	-	TWA: 2 mg/m ³ STEL: 4 mg/m ³	-
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Nitric Acid 7697-37-2	TWA: 2 ppm STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³	Ceiling: 2.6 mg/m ³	TWA: 1 ppm TWA: 2.6 mg/m ³ STEL: 1 ppm STEL: 2.6 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ Ceiling: 2 ppm Cutânea*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ Ceiling: 2.5 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³ K*	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
Zink (stabilized) 7440-66-6	-	-	TWA: 0.1 mg/m ³ TWA: 2 mg/m ³	-	-
vanadium pentoxide 1314-62-1	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ TWA: 0.1 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.005 mg/m ³ TWA: 0.030 mg/m ³ STEL: 0.005 mg/m ³ STEL: 0.030 mg/m ³	TWA: 0.05 mg/m ³ Sk*
Titanium 7440-32-6	-	TWA: 10 mg/m ³ STEL: 15 mg/m ³	-	-	-
Thallium 7440-28-0	TWA: 0.02 mg/m ³ Sk*	-	TWA: 0.1 mg/m ³	-	TWA: 0.1 mg/m ³ Sk*
Silver	TWA: 0.01 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.1 mg/m ³	TWA: 0.01 mg/m ³	TWA: 0.1 mg/m ³

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7440-22-4				STEL: 0.02 mg/m ³	
Selenium 7782-49-2	TWA: 0.2 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.1 mg/m ³
Nickel 7440-02-0	TWA: 1.5 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.05 mg/m ³ S+	TWA: 0.006 mg/m ³ STEL: 0.048 mg/m ³	TWA: 1 mg/m ³ Sen+
Molybdenum 7439-98-7	TWA: 10 mg/m ³ TWA: 3 mg/m ³	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³ TWA: 10 mg/m ³	-	TWA: 10 mg/m ³ TWA: 3 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.4 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³
Lead 7439-92-1	TWA: 0.05 mg/m ³	TWA: 0.15 mg/m ³	TWA: 0.15 mg/m ³ TWA: 0.5 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.4 mg/m ³	TWA: 0.15 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	TWA: 1 mg/m ³	-	-	-	TWA: 1 mg/m ³
Copper 7440-50-8	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.2 mg/m ³ STEL: 1.5 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³	-	TWA: 0.01 mg/m ³
Cobalt 7440-48-4	TWA: 0.02 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	TWA: 0.05 mg/m ³ S+	-	TWA: 0.02 mg/m ³ Sen+
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	-	-	-
Calcium carbonate 471-34-1	-	TWA: 10 mg/m ³	-	-	-
Cadmium 7440-43-9	TWA: 0.001 mg/m ³ TWA: 0.004 mg/m ³	TWA: 0.001 mg/m ³	TWA: 0.03 mg/m ³ TWA: 0.15 mg/m ³ STEL: 0.15 mg/m ³ STEL: 0.75 mg/m ³	TWA: 0.004 mg/m ³	TWA: 0.01 mg/m ³ TWA: 0.002 mg/m ³
Boric acid 10043-35-3	TWA: 2 mg/m ³ STEL: 6 mg/m ³	-	-	TWA: 0.5 mg/m ³ STEL: 1.0 mg/m ³	TWA: 2 mg/m ³ STEL: 6 mg/m ³
Beryllium Oxyacetate 19049-40-2	STEL: 0.01 mg/m ³	TWA: 0.0002 mg/m ³	TWA: 0.005 mg/m ³ TWA: 0.002 mg/m ³ STEL: 0.025 mg/m ³ STEL: 0.01 mg/m ³	-	TWA: 0.0002 mg/m ³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³
Arsenic 7440-38-2	TWA: 0.01 mg/m ³	TWA: 0.01 mg/m ³ STEL: 0.1 mg/m ³	-	-	TWA: 0.01 mg/m ³
Antimony 7440-36-0	TWA: 0.5 mg/m ³	TWA: 0.2 mg/m ³ STEL: 0.5 mg/m ³	TWA: 0.5 mg/m ³	-	TWA: 0.5 mg/m ³
Ammonium silicofluoride 16919-19-0	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³	TWA: 2.5 mg/m ³ STEL: 10 mg/m ³ Sk*	TWA: 2.5 mg/m ³
Aluminum nitrate	-	-	TWA: 2 mg/m ³	-	-

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nonahydrate 7784-27-2			
Chemical name	Sweden	Switzerland	United Kingdom
Nitric Acid 7697-37-2	NGV: 0.5 ppm NGV: 1.3 mg/m ³ Bindande KGV: 1 ppm Bindande KGV: 2.6 mg/m ³	TWA: 2 ppm TWA: 5 mg/m ³ STEL: 2 ppm STEL: 5 mg/m ³	STEL: 1 ppm STEL: 2.6 mg/m ³
hydrofluoric acid 7664-39-3	NGV: 1.8 ppm NGV: 1.5 mg/m ³ Bindande KGV: 2 ppm Bindande KGV: 1.7 mg/m ³	TWA: 1 ppm TWA: 0.83 mg/m ³ STEL: 2 ppm STEL: 1.66 mg/m ³	TWA: 1.8 ppm TWA: 1.5 mg/m ³ STEL: 3 ppm STEL: 2.5 mg/m ³
vanadium pentoxide 1314-62-1	NGV: 0.2 mg/m ³ Bindande KGV: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.05 mg/m ³	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³
Thallium 7440-28-0	-	TWA: 0.1 mg/m ³ Sk*	-
Silver 7440-22-4	NGV: 0.1 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.8 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Selenium 7782-49-2	NGV: 0.1 mg/m ³	TWA: 0.02 mg/m ³ STEL: 0.16 mg/m ³ Sk*	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Nickel 7440-02-0	NGV: 0.5 mg/m ³ S+	TWA: 0.5 mg/m ³ S+	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³ Sk*
Molybdenum 7439-98-7	NGV: 10 mg/m ³ NGV: 5 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³
Manganese(II) nitrate hexahydrate 17141-63-8	NGV: 0.2 mg/m ³ NGV: 0.05 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.05 mg/m ³ STEL: 0.6 mg/m ³ STEL: 0.15 mg/m ³
Lead 7439-92-1	NGV: 0.1 mg/m ³ NGV: 0.05 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.8 mg/m ³	TWA: 0.15 mg/m ³ STEL: 0.45 mg/m ³
Ferric nitrate nonahydrate 7782-61-8	-	TWA: 1 mg/m ³	TWA: 1 mg/m ³ STEL: 2 mg/m ³
Copper 7440-50-8	NGV: 0.01 mg/m ³	TWA: 0.1 mg/m ³ STEL: 0.2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³ STEL: 2 mg/m ³
Cobalt 7440-48-4	NGV: 0.02 mg/m ³ Sk* S+	TWA: 0.05 mg/m ³ Sk* S+	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³ Sen+
Chromium (III) nitrate nonahydrate 7789-02-8	NGV: 0.5 mg/m ³	TWA: 0.5 mg/m ³ S+	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³
Calcium carbonate 471-34-1	-	TWA: 3 mg/m ³ TWA: 10 mg/m ³	TWA: 10 mg/m ³ TWA: 4 mg/m ³

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			STEL: 30 mg/m ³ STEL: 12 mg/m ³
Cadmium 7440-43-9	NGV: 0.001 mg/m ³ NGV: 0.004 mg/m ³	TWA: 0.001 mg/m ³ Sk*	TWA: 0.025 mg/m ³ STEL: 0.075 mg/m ³
Boric acid 10043-35-3	-	TWA: 1.8 mg/m ³ STEL: 1.8 mg/m ³	-
Beryllium Oxyacetate 19049-40-2	NGV: 0.0002 mg/m ³ NGV: 0.0006 mg/m ³ S+	TWA: 0.0006 mg/m ³ S+	TWA: 0.002 mg/m ³ STEL: 0.006 mg/m ³
Barium nitrate 10022-31-8	NGV: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 4 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³
Arsenic 7440-38-2	NGV: 0.01 mg/m ³	TWA: 0.01 mg/m ³ Sk*	TWA: 0.1 mg/m ³ STEL: 0.3 mg/m ³
Antimony 7440-36-0	NGV: 0.25 mg/m ³	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³ STEL: 1.5 mg/m ³
Ammonium silicofluoride 16919-19-0	NGV: 2 mg/m ³	-	TWA: 2.5 mg/m ³ STEL: 7.5 mg/m ³
Aluminum nitrate nonahydrate 7784-27-2	NGV: 1 mg/m ³	TWA: 2 mg/m ³	TWA: 2 mg/m ³ STEL: 6 mg/m ³

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
hydrofluoric acid 7664-39-3	-	-	-	8 mg/g Creatinine - urine (Fluorides) - at the end of the work shift 4.0 mg/g Creatinine - urine (Fluorides) - before the start of the work shift in the middle of the week	-
Nickel 7440-02-0	-	Check 7 µg/L (urine - spontaneous urine after end of work day, at the end of a work week/end of the shift) (-)	45 µg/L - urine (Nickel) - after several work shifts	10 µg/L - plasma (Nickel) - at the end of the work shift 8 µg/g Creatinine - urine (Nickel) - at the end of the work shift	0.077 µmol/mmol Creatinine (urine - Nickel discretionary) 0.04 mg/g Creatinine (urine - Nickel discretionary)
Manganese(II) nitrate hexahydrate 17141-63-8	-	Check 20 µg/L (blood - whole blood not	-	-	-



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		provided) (-)			
Lead 7439-92-1	70 µg/100 mL - blood (Lead) - no restriction 0.075 mg/m ³ - air (Lead) - 40 hours per week 40 µg/100 mL - blood (Lead) - no restriction	Check 120 µg/100 mL RBC Erythrocyte protoporphyrin (blood - Ethylenediaminetetracetic acid not provided) 30 µg/100 mL blood Lead (blood - Ethylenediaminetetracetic acid not provided) 3.8 million/µL Erythrocytes (blood - Ethylenediaminetetracetic acid not provided) 12 g/dL Hemoglobin (blood - Ethylenediaminetetracetic acid not provided) 35 % Hematocrit (blood - Ethylenediaminetetracetic acid not provided) 10 mg/L (urine - .delta.-Aminolevulinic acid not provided) 3.2 million/µL Erythrocytes (blood - Ethylenediaminetetracetic acid not provided) 10 g/dL Hemoglobin (blood - Ethylenediaminetetracetic acid not provided) 30 % Hematocrit (blood - Ethylenediaminetetracetic acid not provided)	300 µg/L - blood (Lead) - not fixed 400 µg/L - blood (Lead) - not fixed	400 µg Pb/L - blood (Lead) - not critical 300 µg Pb/L - blood (Lead) - not critical 15 U/LE - blood (.delta.-Aminolevulinic acid dehydratase) - not critical 1.50 mg/LE - blood (Protoporphyrin in erythrocytes) - after exposure during 2-3 months (sample protected from light)	13 µmol/mmol Creatinine (urine - 5-Aminolevulinic acid discretionary) 0.035 µmol/mmol Creatinine (urine - Coproporphyrin discretionary) 15 mg/g Creatinine (urine - 5-Aminolevulinic acid discretionary) 0.2 mg/g Creatinine (urine - Coproporphyrin discretionary) 0.4 mg/L (blood - Lead discretionary)



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		acetic acid not provided) 6 mg/L (urine - .delta.-Aminolevulinic acid not provided)			
Cobalt 7440-48-4	-	Check 10 µg/L (urine - spontaneous urine after end of work day, at the end of a work week/end of the shift) (-)	-	-	-
Cadmium 7440-43-9	-	Check 2.5 µg/g Creatinine (urine - N-Acetylglucosaminidase not provided) (-)	-	5 µg/L - blood (Cadmium) - not critical 5 µg/g Creatinine - urine (Cadmium) - single sample or urine collected over 24 hours	0.005 µmol/mmol Creatinine (urine - Cadmium discretionary) 0.005 mg/g Creatinine (urine - Cadmium discretionary) 0.045 µmol/L (blood - Cadmium discretionary) 0.005 mg/L (blood - Cadmium discretionary)
Arsenic 7440-38-2	-	Check 3.2 million/µL Erythrocytes (red and white blood count - not provided) 3.8 million/µL Erythrocytes (red and white blood count - not provided) 4000 Leukocytes/µL (red and white blood count - not provided) 13000 Leukocytes/µL (red and white blood count - not	-	70 µg/L - urine (Arsenic) - at the end of the work shift or urine collected over 24 hours	0.05 mg/g Creatinine (urine - Arsenic end of workweek) 0.075 µmol/mmol Creatinine (urine - Arsenic end of workweek)



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		<p>provided) 10 g/dL Hemoglobin (red and white blood count - not provided) 12 g/dL Hemoglobin (red and white blood count - not provided) 30 % Hematocrit (red and white blood count - not provided) 35 % Hematocrit (red and white blood count - not provided) 50 µg/L (urine - after end of work day, at the end of a work week/end of the shift)</p>			
Ammonium silicofluoride 16919-19-0	-	<p>Check 4 mg/g Creatinine (urine - before following shift) 7 mg/g Creatinine (urine - immediately after exposure or end of the shift)</p>	-	<p>8 mg/g Creatinine - urine (Fluorides) - at the end of the work shift 4.0 mg/g Creatinine - urine (Fluorides) - before the start of the work shift in the middle of the week</p>	-
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
hydrofluoric acid 7664-39-3	-	-	<p>3 mg/g creatinine - urine (Fluorides) - beginning of shift 10 mg/g creatinine - urine (Fluorides) - end of shift</p>	<p>4.0 mg/g Creatinine (urine - Fluoride end of shift) 4 mg/L - BAT (end of exposure or end of shift) urine</p>	<p>4.0 mg/g Creatinine (urine - Fluoride end of shift)</p>
vanadium pentoxide 1314-62-1	-	-	<p>- urine (Vanadium) - end of shift at end of workweek</p>	<p>0.15 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine</p>	-
Selenium 7782-49-2	-	-	-	<p>150 µg/L (serum - Selenium no restriction)</p>	<p>150 µg/L (serum - Selenium no restriction)</p>



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				150 µg/L - BAT (no restriction in steady state) serum 100 µg/L - BAR (no restriction in steady state) plasma/serum 30 µg/g Creatinine - BAR (for long-term exposures: at the end of the shift after several shifts) urine	
Nickel 7440-02-0	-	0.1 µmol/L (urine - Nickel after the shift after a working week or exposure period)	-	3 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine 15 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 30 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 45 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine	-
Molybdenum 7439-98-7	-	-	-	150 µg/L - BAR (end of exposure or end of shift) urine	-
Manganese(II) nitrate hexahydrate 17141-63-8	-	-	-	15 µg/L - BAR (no restriction in steady state) blood	-
Lead 7439-92-1	20 µg/100 mL (blood - Lead)	1.4 µmol/L (blood - Lead time of day does not matter) 50 µg/dL (blood - Lead) 40 µg/dL (blood - Lead)	400 µg/L - blood (Lead) - 180 µg/L - blood (Lead) - indifferent sampling time 300 µg/L - blood (Lead) - 200 µg/L - blood (Lead) - 100 µg/L - blood (Lead) -	150 µg/L (whole blood - Lead no restriction) 150 µg/L - BAT (no restriction in steady state) blood 30 µg/L - BAR (no restriction in steady state) blood 40 µg/L - BAR (no restriction in steady state) blood	150 µg/L (whole blood - Lead no restriction)



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Cobalt 7440-48-4	-	130 nmol/L (urine - Cobalt after the work phase or shift after a working week or exposure period)	- blood (Cobalt) - end of shift at end of workweek 0,005 mg/g creatinine - urine (Cobalt) - end of shift at end of workweek	35 µg/L - BLW (for long-term exposures: at the end of the shift after several shifts) urine 1.5 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine 6 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 15 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 30 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 60 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 300 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine 3 µg/L - (long-term exposure: at the end of the shift after several shifts) - urine	-
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	2.5 µg/L - urine (Total Chromium) - end of shift at end of workweek	0.6 µg/L - BAR (end of exposure or end of shift) urine	-
Cadmium 7440-43-9	-	20 nmol/L (urine - Cadmium at the end of a working week; time of day does not matter)	0.005 mg/g creatinine - urine (Cadmium) - not critical 0.004 mg/L - blood (Cadmium) - not critical	1 µg/L - BAR (no restriction in steady state) blood 0.8 µg/L - BAR (no restriction in steady state) urine	-



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Barium nitrate 10022-31-8	-	-	-	10 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine	-
Arsenic 7440-38-2	-	70 nmol/L (urine - Arsenic, inorganic after the work phase or shift after a working week or exposure period)	- urine (Metabolites of inorganic Arsenic) - end of workweek	10 µg/L - BLW (end of exposure or end of shift) urine 0.5 µg/L - BAR (end of exposure or end of shift) urine 2 µg/L - BAR (end of exposure or end of shift) urine 10 µg/L - BAR (end of exposure or end of shift) urine 2 µg/L - (end of exposure or end of shift) - urine 2.5 µg/L - (end of exposure or end of shift) - urine 3 µg/L - (end of exposure or end of shift) - urine 8 µg/L - (end of exposure or end of shift) - urine 11 µg/L - (end of exposure or end of shift) - urine 13 µg/L - (end of exposure or end of shift) - urine 36 µg/L - (end of exposure or end of shift) - urine 57 µg/L - (end of exposure or end of shift) - urine	-
Antimony 7440-36-0	-	-	-	0.2 µg/L - BAR (for long-term exposures: at the end of the shift after several shifts) urine	-

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Ammonium silicofluoride 16919-19-0	-	-	- urine (Fluorides) - beginning of shift - urine (Fluorides) - end of shift	4.0 mg/g Creatinine (urine - Fluoride end of shift)	4.0 mg/g Creatinine (urine - Fluoride end of shift)
Chemical name	Hungary	Ireland	Italy MDLPS	Italy AIDII	
hydrofluoric acid 7664-39-3	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	
Selenium 7782-49-2	0.075 mg/g Creatinine (urine - Selenium not critical) 0.110 µmol/mmol Creatinine (urine - Selenium not critical)	-	-	-	
Nickel 7440-02-0	0.003 mg/L (urine - Nickel at end of workweek, end of shift) 0.051 µmol/L (urine - Nickel at end of workweek, end of shift)	3 µg/L (urine - Nickel after several consecutive working shifts)	-	-	
Lead 7439-92-1	-	70 µg/100 mL (blood - Lead not critical) 40 µg/100 mL (blood - Lead not critical) 30 µg/100 mL (blood - Lead not critical)	60 Pb µg/100 mL (blood - end of workweek)	30 µg/100 mL - blood (Lead) - not critical	
Cobalt 7440-48-4	0.01 mg/g Creatinine (urine - Cobalt end of shift) 0.019 µmol/mmol Creatinine (urine - Cobalt end of shift)	15 µg/L (urine - Cobalt end of shift at end of workweek) 1 µg/L (blood - Cobalt end of shift at end of workweek)	-	15 µg/L - urine (Cobalt) - end of shift at end of workweek	
Cadmium 7440-43-9	0.02 mg/g Creatinine (urine - Cadmium not critical) 0.02 µmol/mmol Creatinine (urine - Cadmium not critical)	2 µg/g Creatinine (urine - not critical)	-	5 µg/g Creatinine - urine (Cadmium) - not critical 5 µg/L - blood (Cadmium) - not critical	
Arsenic	0.05 mg/L (urine - Arsenic)	35 µg/L (urine - inorganic)	-	35 µg As/L - urine	

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7440-38-2	end of shift) 0.67 µmol/L (urine - Arsenic end of shift)	Arsenic plus methylated metabolites end of workweek)		(Inorganic arsenic plus methylated metabolites) - end of workweek
Ammonium silicofluoride 16919-19-0	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/L (urine - Fluoride prior to shift) 3 mg/L (urine - Fluoride end of 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
hydrofluoric acid 7664-39-3	-	-	5 mg/g Creatinine - urine (Fluorine) - end of shift	7 mg/g creatinine (urine - Fluoride end of exposure or work shift) 4 mg/g creatinine (urine - Fluoride prior to shift)
vanadium pentoxide 1314-62-1	-	-	-	50 µg/g creatinine (urine - Vanadium after all work shifts) 50 µg/g creatinine (urine - Vanadium end of exposure or work shift)
Nickel 7440-02-0	3 µg/L - urine (Nickel) -	-	3 µg/L - urine (Nickel) - end of shift	0.03 mg/L (blood - Nickel end of exposure or work shift)
Lead 7439-92-1	30 µg/100 mL - blood (Lead) - 100 µg/g Creatinine - urine (Coproporphyrin) - 5 mg/g Creatinine - urine (Aminolevulinic acid) -	70 µg/100 mL - blood (Lead) - 0.072 mg/m ³ - blood (Lead) - 40 µg/100 mL - blood (Lead) -	150 µg/L - urine (Lead) - end of shift 70 µg/100 mL - blood (Lead) - end of shift 3 mg/cm - hair (Lead) - end of shift 10 mg/L - urine (.delta.-Aminolevulinic acid) - end of shift 300 µg/L - urine (Coproporphyrin) - end of shift 100 µg/100 mL Erythrocyte - blood (free Erythrocytes protoporphyrin) - end of shift	400 µg/L (blood - Lead not critical) 100 µg/L (blood - Lead not critical) 15 mg/L (urine - .delta.-Aminolevulinic acid not critical) 6 mg/L (urine - .delta.-Aminolevulinic acid not critical) 0.30 mg/L (urine - Coproporphyrins not critical)
Cobalt	-	-	15 µg/L - urine (Cobalt) -	30 µg/L (urine - Cobalt not

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7440-48-4			end of work week 1 µg/L - blood (Cobalt) - end of work week	critical)
Cadmium 7440-43-9	2 µg/L - urine (Cadmium) -	-	2 µg/g Creatinine - urine (Cadmium) - end of shift 5 µg/L - blood (Cadmium) - end of shift 2 mg/L - urine (Protein) - end of shift	3.1 µg/L (urine - Cadmium not critical)
Arsenic 7440-38-2	-	-	50 µg/g Creatinine - urine (Arsenic) - end of work week 0.5 mg/100 g - hair (Arsenic) - end of work week	-
Antimony 7440-36-0	-	-	1 mg/L - urine (Antimony) - end of shift	-
Ammonium silicofluoride 16919-19-0	-	-	5 mg/g Creatinine - urine (Fluorine) - end of shift	-
Chemical name	Slovenia	Spain	Switzerland	United Kingdom
hydrofluoric acid 7664-39-3	7.0 mg/g Creatinine - urine (Fluoride) - at the end of the work shift 4.0 mg/g Creatinine - urine () - before the next working day	2 mg/L (urine - Fluorides pre-shift) 3 mg/L (urine - Fluorides end of shift)	4 mg/L (urine - Fluoride end of shift) 211 µmol/L (urine - Fluoride end of shift)	-
vanadium pentoxide 1314-62-1	-	50 µg/g Creatinine (urine - Vanadium end of workweek)	70 µg/g creatinine (urine - Vanadium end of shift, and after several shifts (for long-term exposures)) 155 nmol/mmol creatinine (urine - Vanadium end of shift, and after several shifts (for long-term exposures))	-
Selenium 7782-49-2	-	-	150 µg/L (serum - Selenium no restrictions) 2 µmol/L (serum - Selenium no restrictions)	-
Nickel 7440-02-0	-	-	45 µg/L (urine - Nickel end of shift, and after several shifts (for long-term exposures)) 766.6 nmol/L (urine - Nickel end of shift, and after several shifts (for	-

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Lead 7439-92-1	400 µg/L - blood (Lead) - not relevant 300 µg/L - blood (Lead) - not relevant	70 µg/dL (blood - Lead not critical)	long-term exposures)) 400 µg/L (whole blood - Lead no restrictions) 1.93 µmol/L (whole blood - Lead no restrictions) 100 µg/L (whole blood - Lead no restrictions) 0.48 µmol/L (whole blood - Lead no restrictions)	-
Cobalt 7440-48-4	-	15 µg/L (urine - Cobalt end of workweek) 1 µg/L (blood - Cobalt end of workweek)	30 µg/L (urine - Cobalt end of shift) 509 nmol/L (urine - Cobalt end of shift)	-
Cadmium 7440-43-9	-	2 µg/g Creatinine (urine - Cadmium not critical) 5 µg/L (blood - Cadmium not critical)	2 µg/g creatinine (urine - Cadmium no restrictions) 2.01 nmol/mmol creatinine (urine - Cadmium no restrictions)	-
Arsenic 7440-38-2	-	35 µg As/L (urine - Inorganic arsenic plus Methylated metabolites end of workweek)	50 µg/L (urine - inorganic Arsenic and Methylated metabolite end of shift, and after several shifts (for long-term exposures)) 667 nmol/L (urine - inorganic Arsenic and Methylated metabolite end of shift, and after several shifts (for long-term exposures))	-
Ammonium silicofluoride 16919-19-0	7.0 mg/g Creatinine - urine (Fluoride) - at the end of the work shift 4.0 mg/g Creatinine - urine () - before the next working day	-	-	-

Derived No Effect Level (DNEL) No information available.

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Personal protective equipment

Eye/face protection Avoid contact with eyes. Wear safety glasses with side shields (or goggles). Tight sealing

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	safety goggles.
Hand protection	The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374. Wear protective Neoprene™ gloves. Polyvinyl chloride (PVC). Wear suitable gloves. Impervious gloves.
Skin and body protection	Wear suitable protective clothing. Long sleeved clothing.
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.
General hygiene considerations	Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Wear suitable gloves and eye/face protection. Regular cleaning of equipment, work area and clothing is recommended.
Environmental exposure controls	Do not allow into any sewer, on the ground or into any body of water.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Liquid
Colour	colourless
Odour	Odourless.
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	No data available	None known
Initial boiling point and boiling range	No data available	None known
Flammability	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Flash point	No data available	None known
Autoignition temperature	460 °C	None known
Decomposition temperature		None known
pH	No data available	None known
pH (as aqueous solution)	No data available	No information available
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known
Water solubility	No data available	None known

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Solubility(ies)	No data available	None known
Partition coefficient	No data available	None known
Vapour pressure	No data available	None known
Relative density	No data available	None known
Bulk density	No data available	
Liquid Density	No data available	
Relative vapour density	No data available	None known
Particle characteristics		
Particle Size	No information available	
Particle Size Distribution	No information available	

9.2. Other information

9.2.1. Information with regards to physical hazard classes
Not applicable

9.2.2. Other safety characteristics
No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity No information available.

10.2. Chemical stability

Stability Stable under normal conditions.

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.

10.4. Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

10.5. Incompatible materials

Incompatible materials Oxidising agent. Strong acids. Strong bases.

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

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. Causes serious eye damage. May cause irreversible damage to eyes.
Skin contact	Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).
Ingestion	Specific test data for the substance or mixture is not available. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. May cause redness and tearing of the eyes.

Numerical measures of toxicity

Acute toxicity

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

ATEmix (oral)	5,010.00 mg/kg
ATEmix (dermal)	5,000.00 mg/kg
ATEmix (inhalation-gas)	99,999.00 ppm
ATEmix (inhalation-dust/mist)	50.10 mg/l
ATEmix (inhalation-vapour)	66.70 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Nitric Acid			= 2500 ppm (Rat) 1 h ATE (vapours) = 2.65 mg/L
hydrofluoric acid			= 0.79 mg/L (Rat) 1 h
Zink (stabilized)	= 630 mg/kg (Rat)		

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vanadium pentoxide	= 466.93 mg/kg (Rat) = 10 mg/kg (Rat)	> 2500 mg/kg (Rat)	= 4.4 mg/L (Rat) 4 h = 2.21 mg/L (Rat) 4 h
Silver	> 5000 mg/kg (Rat)	> 2000 mg/kg (rat)	> 5.16 mg/L (Rat) 4 h
Selenium	= 6700 mg/kg (Rat)		
Nickel	> 9000 mg/kg (Rat)		> 10.2 mg/L (Rat) 1 h
Molybdenum		> 2000 mg/kg (Rat)	> 5.84 mg/L (Rat) 4 h
Ferric nitrate nonahydrate	= 3250 mg/kg (Rat)		
Copper			> 5.11 mg/L (Rat) 4 h
Cobalt	= 6171 mg/kg (Rat)		< 0.05 mg/L (Rat) 4 h
Chromium (III) nitrate nonahydrate	= 3250 mg/kg (Rat)		
Calcium carbonate	= 6450 mg/kg (Rat)	> 2000 mg/kg (Rat)	> 3 mg/L (Rat) 4 h
Cadmium	= 1140 mg/kg (Rat)		= 25 mg/m ³ (Rat) 30 min
Boric acid	= 2660 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 2.12 mg/L (Rat) 4 h
Barium nitrate	= 355 mg/kg (Rat)		> 1.1 mg/L (Rat) 243 min
Arsenic	= 15 mg/kg (Rat)		
Antimony	= 7000 mg/kg (Rat)		
Aluminum nitrate nonahydrate	= 542.5 mg/kg (Rat)		

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

Skin corrosion/irritation	Classification based on data available for ingredients. Causes skin irritation.
Serious eye damage/eye irritation	Classification based on data available for ingredients. Causes burns. Causes serious eye damage.
Respiratory or skin sensitisation	No information available.
Germ cell mutagenicity	No information available.

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The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as mutagenic.

Chemical name	European Union
vanadium pentoxide	Muta. 2
Cobalt	Muta. 2
Cadmium	Muta. 2

Carcinogenicity No information available.

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

Chemical name	European Union
vanadium pentoxide	Carc. 1B
Nickel	Carc. 2
Cobalt	Carc. 1B
Cadmium	Carc. 1B
Beryllium Oxyacetate	Carc. 1B

Reproductive toxicity No information available.

The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Chemical name	European Union
vanadium pentoxide	Repr. 2 Lact.
Lead	Repr. 1A Lact.
Cobalt	Repr. 1B
Cadmium	Repr. 2
Boric acid	Repr. 1B

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

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

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11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Unknown aquatic toxicity Contains 0 % of components with unknown hazards to the aquatic environment.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
hydrofluoric acid	-	-	-	EC50: =270mg/L (48h, Daphnia species)
Zink (stabilized)	EC50: 0.11 - 0.271mg/L (96h, Pseudokirchneriella subcapitata) EC50: 0.09 - 0.125mg/L (72h, Pseudokirchneriella subcapitata)	LC50: 2.16 - 3.05mg/L (96h, Pimephales promelas) LC50: 0.211 - 0.269mg/L (96h, Pimephales promelas) LC50: =2.66mg/L (96h, Pimephales promelas) LC50: =30mg/L (96h, Cyprinus carpio) LC50: =0.45mg/L (96h, Cyprinus carpio) LC50: =7.8mg/L (96h, Cyprinus carpio) LC50: =3.5mg/L (96h, Lepomis macrochirus) LC50: =0.24mg/L (96h, Oncorhynchus mykiss) LC50: =0.59mg/L (96h, Oncorhynchus mykiss) LC50: =0.41mg/L (96h, Oncorhynchus mykiss)	-	EC50: 0.139 - 0.908mg/L (48h, Daphnia magna)
vanadium pentoxide	-	LC50: 5.2 mg/L (96h, Oncorhynchus mykiss)	-	LC50: 1.52 mg/L (48h, Daphnia magna)
Silver	-	LC50: 0.00155 - 0.00293mg/L (96h, Pimephales promelas) LC50: =0.0062mg/L (96h,	-	EC50: =0.00024mg/L (48h, Daphnia magna)

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		Oncorhynchus mykiss) LC50: =0.064mg/L (96h, Lepomis macrochirus)		
Selenium	-	LC50: >100mg/L (96h, Oncorhynchus mykiss)	-	-
Nickel	EC50: =0.18mg/L (72h, Pseudokirchneriella subcapitata) EC50: 0.174 - 0.311mg/L (96h, Pseudokirchneriella subcapitata)	LC50: >100mg/L (96h, Brachydanio rerio) LC50: =1.3mg/L (96h, Cyprinus carpio) LC50: =10.4mg/L (96h, Cyprinus carpio)	-	EC50: >100mg/L (48h, Daphnia magna) EC50: =1mg/L (48h, Daphnia magna)
Lead	-	LC50: =0.44mg/L (96h, Cyprinus carpio) LC50: =1.17mg/L (96h, Oncorhynchus mykiss) LC50: =1.32mg/L (96h, Oncorhynchus mykiss)	-	EC50: =600µg/L (48h, water flea)
Copper	EC50: 0.031 - 0.054mg/L (96h, Pseudokirchneriella subcapitata) EC50: 0.0426 - 0.0535mg/L (72h, 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)
Cobalt	-	LC50: >100mg/L (96h, Brachydanio rerio)	-	-
Cadmium	-	LC50: =0.003mg/L (96h, Oncorhynchus mykiss) LC50: =0.006mg/L (96h, Oncorhynchus mykiss) LC50: =0.002mg/L (96h, Cyprinus carpio) LC50: =4.26mg/L (96h, Cyprinus carpio) LC50: =0.24mg/L (96h, Cyprinus carpio)	-	EC50: =0.0244mg/L (48h, Daphnia magna)

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		LC50: =21.1mg/L (96h, Lepomis macrochirus) LC50: =0.016mg/L (96h, Oryzias latipes) LC50: 0.0004 - 0.003mg/L (96h, Pimephales promelas)		
Boric acid	-	-	-	EC50: 115 - 153mg/L (48h, Daphnia magna)
Antimony	-	LC50: >6.2 - 8.3mg/L (96h, Cyprinodon variegatus)	-	-
Ammonium silicofluoride	-	LC50: =25.8mg/L (96h, Pimephales promelas)	-	-

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient
Nitric Acid	-2.3
hydrofluoric acid	-1.4
Boric acid	-1.09
Ammonium silicofluoride	-6.01 @ 20 °C

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment No information available.

Chemical name	PBT and vPvB assessment
Nitric Acid	The substance is not PBT / vPvB
hydrofluoric acid	The substance is not PBT / vPvB
Zink (stabilized)	The substance is not PBT / vPvB
vanadium pentoxide	PBT assessment does not apply
Titanium	The substance is not PBT / vPvB



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Silver	PBT assessment does not apply
Selenium	PBT assessment does not apply
Nickel	The substance is not PBT / vPvB
Molybdenum	PBT assessment does not apply
Manganese(II) nitrate hexahydrate	The substance is not PBT / vPvB
Lead	PBT assessment does not apply
Ferric nitrate nonahydrate	PBT assessment does not apply
Copper	The substance is not PBT / vPvB
Cobalt	The substance is not PBT / vPvB
Chromium (III) nitrate nonahydrate	The substance is not PBT / vPvB
Calcium carbonate	The substance is not PBT / vPvB
Cadmium	PBT assessment does not apply
Boric acid	The substance is not PBT / vPvB
Barium nitrate	The substance is not PBT / vPvB
Arsenic	PBT assessment does not apply
Antimony	The substance is not PBT / vPvB
Ammonium silicofluoride	PBT assessment does not apply
Aluminum nitrate nonahydrate	PBT assessment does not apply

12.6. Endocrine disrupting properties

Endocrine disrupting properties No information available.

12.7. Other adverse effects

No information available.

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.

SECTION 14: Transport information

IATA

14.1 UN number or ID number UN3264
14.2 UN proper shipping name Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es) 8

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14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	A3, A803
ERG Code	8L

IMDG

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, Marine pollutant
14.5 Marine pollutant	P
Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	223, 274
EmS-No.	F-A, S-B No information available
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1

ADR

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid, hydrofluoric acid), 8, III, (E), Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1
Tunnel restriction code	(E)

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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	Title
hydrofluoric acid 7664-39-3	RG 32	-
Zink (stabilized) 7440-66-6	RG 61	-
vanadium pentoxide 1314-62-1	RG 66	-
Selenium 7782-49-2	RG 75	-
Lead 7439-92-1	RG 1	-
Cobalt 7440-48-4	RG 65, RG 70, RG 70bis, RG 70ter	-
Cadmium 7440-43-9	RG 61, RG 61bis	-
Arsenic 7440-38-2	RG 20, RG 20bis	-
Antimony 7440-36-0	RG 73	-

Germany

Water hazard class (WGK) strongly hazardous to water (WGK 3)
TA Luft (German Air Pollution Control Regulation)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
vanadium pentoxide	Present	-	Development Category 2 Fertility Category 2
Selenium	-	-	Can be harmful via breastfeeding
Manganese(II) nitrate hexahydrate	-	-	Fertility Category 2 Development Category 2

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Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Lead	-	-	Fertility Category 1A Development Category 1A Can be harmful via breastfeeding
Cobalt	Present	-	Fertility Category 1B
Cadmium	Present	-	Fertility Category 1B; including stabilized, pyrophoric Development Category 1B; including stabilized, pyrophoric Can be harmful via breastfeeding including stabilized, pyrophoric
Boric acid	-	-	Fertility Category 1B Development Category 1B
Beryllium Oxyacetate	Present	-	-
Arsenic	Present	-	Can be harmful via breastfeeding Development Category 1B Fertility Category 1B
Aluminum nitrate nonahydrate	-	-	Can be harmful via breastfeeding Development Category 1B

Poland

SDS created according to the following Polish regulation: Act of February 25, 2011 on chemical substances and their mixtures (Journal of Laws of 2018, item 143, as amended). Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing the European Chemicals Agency (EC) as amended. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, as amended. Regulation of the Minister of Health of 10 August 2012 on the criteria and method of classifying chemical substances and their mixtures (Journal of Laws of 2012, item 1018). Regulation of the Minister of Health of 20 April 2012 on labeling packaging of hazardous substances and mixtures and some mixtures (Journal of Laws of 2012, item 445). Regulation of the Minister of Family, Labor and Social Policy of 12 June 2018 on the maximum allowable concentrations and intensities of factors harmful to health in the work environment (Journal of Laws of 2018, item 1286). Announcement of the Minister of Economy, Labor and Social Policy of August 28, 2003 on the publication of the unified text of the Ordinance of the Minister of Labor and Social Policy on general health and safety at work regulations (Journal of Laws of 2003, No. 169, item 1650) . Regulation of the Minister of Health of 30 December

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2004 on occupational safety and health related to the presence of chemical agents in the workplace (Journal of Laws of 2005, No. 11, item 86). Act of December 14, 2012 on waste (Journal of Laws of 2013, item 21) Regulation of the Minister of Health of December 30, 2004 on occupational health and safety related to the presence of chemical agents in the workplace (Journal U. of 2005, No. 11, item 86). Waste Act of December 14, 2012 (Journal of Laws of 2013, item 21). Act of 13 June 2013 on the management of packaging and packaging waste, Journal of Laws 2013, item 888). Government statement of September 24, 2002 - European Agreement on the International Carriage of Dangerous Goods by Road (ADR) (Journal of Laws No. 194, item 1629 and Journal of Laws of 2003, No. 207, item 2013 and 2014).

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)

DIRECTIVE (EU) 2021/1187 on the marketing and use of explosives precursors

Product contains: Reportable explosives precursors. Making available, introduction, possession and use according to Regulation (EU) 2019/1148, Article 9

Product contains: Restricted explosives precursors. Making available, introduction, possession and use according to Regulation (EU) 2019/1148, Article 5 (1) and (3)

Chemical name	RESTRICTED EXPLOSIVES PRECURSORS - ANNEX I	REPORTABLE EXPLOSIVES PRECURSORS - ANNEX II
Nitric Acid - 7697-37-2	3 %w/w	-

Chemical name	Restricted substance per REACH Annex XVII	Substance subject to authorisation per REACH Annex XIV
Nitric Acid - 7697-37-2	75.	
hydrofluoric acid - 7664-39-3	75.	
Zink (stabilized) - 7440-66-6	75.	
vanadium pentoxide - 1314-62-1	75. 28.	
Thallium - 7440-28-0	75.	
Silver - 7440-22-4	75.	
Selenium - 7782-49-2	75.	
Nickel - 7440-02-0	27. 75.	
Lead - 7439-92-1	72. 30. 63. 75.	
Copper - 7440-50-8	75.	
Cobalt - 7440-48-4	30.	

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	28. 75.	
Calcium carbonate - 471-34-1	75.	
Cadmium - 7440-43-9	72. 23. 28. 75.	
Boric acid - 10043-35-3	30. 75.	
Arsenic - 7440-38-2	75.	
Antimony - 7440-36-0	75.	

Persistent Organic Pollutants

Not applicable

Export Notification requirements

This product contains substances which are regulated pursuant to Regulation (EC) No. 649/2012 of the European parliament and of the council concerning the export and import of dangerous chemicals

Chemical name	European Export/Import Restrictions per (EC) 649/2012 - Annex Number
Lead - 7439-92-1	I.1
Cadmium - 7440-43-9	I.1 I.2

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

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

Ozone-depleting substances (ODS) regulation (EC) 1005/2009

Not applicable

EU - Plant Protection Products (1107/2009/EC)

Chemical name	EU - Plant Protection Products (1107/2009/EC)
Calcium carbonate - 471-34-1	Plant protection agent

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

Chemical name	Biocidal Products Regulation (EU) No 528/2012 (BPR)
Silver - 7440-22-4	Product-type 2: Disinfectants and algaecides not intended for direct application to humans or animals Product-type 4: Food and feed area Product-type 5: Drinking water Product-type 9: Fibre, leather, rubber and polymerised materials preservatives Product-type 11: Preservatives for liquid-cooling and processing systems
Copper - 7440-50-8	Product-type 8: Wood preservatives Product-type 21: Antifouling products
Boric acid - 10043-35-3	Product-type 8: Wood preservatives



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EU - Water Framework Directive (2000/60/EC)

Chemical name	EU - Water Framework Directive (2000/60/EC)
Nickel - 7440-02-0	Priority substance
Lead - 7439-92-1	Priority substance
Cadmium - 7440-43-9	Priority hazardous substance

EU - Environmental Quality Standards (2008/105/EC)

Chemical name	EU - Environmental Quality Standards (2008/105/EC)
Nickel - 7440-02-0	Priority substance
Lead - 7439-92-1	Priority substance
Cadmium - 7440-43-9	Priority hazardous substance

International Inventories

TSCA

LGC has not confirmed that the chemical substances in this product are on the TSCA Inventory, and LGC is distributing this product solely for use either in applications statutorily exempt from TSCA and regulated under other laws (e.g., FFDCA, FIFRA) or in research and development activities in accordance with the TSCA Inventory R&D exemption provided at 40 CFR 720.36. It is the end-user's responsibility to understand and follow the requirements that apply to its use of this product.

DSL/NDSL

Contact supplier for inventory compliance status

EINECS/ELINCS

Contact supplier for inventory compliance status

ENCS

Contact supplier for inventory compliance status

IECSC

Contact supplier for inventory compliance status

KECL

Contact supplier for inventory compliance status

PICCS

Contact supplier for inventory compliance status

AIIC

Contact supplier for inventory compliance status

Legend:

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

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

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

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

15.2. Chemical safety assessment

Chemical Safety Report

A Chemical Safety Assessment is not required for this substance

SECTION 16: Other information



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

Full text of H-Statements referred to under section 3

EUH071 - Corrosive to the respiratory tract
EUH201 - Contains lead. Should not be used on surfaces liable to be chewed or sucked by children
H228 - Flammable solid
H272 - May intensify fire; oxidiser
H290 - May be corrosive to metals
H300 - Fatal if swallowed
H301 - Toxic if swallowed
H302 - Harmful if swallowed
H310 - Fatal in contact with skin
H311 - Toxic in contact with skin
H314 - Causes severe skin burns and eye damage
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H319 - Causes serious eye irritation
H330 - Fatal if inhaled
H331 - Toxic if inhaled
H332 - Harmful if inhaled
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H341 - Suspected of causing genetic defects
H350 - May cause cancer
H351 - Suspected of causing cancer
H360 - May damage fertility or the unborn child
H360F - May damage fertility
H360FD - May damage fertility. May damage the unborn child
H361fd - Suspected of damaging fertility. Suspected of damaging the unborn child
H362 - May cause harm to breast-fed children
H372 - Causes damage to organs through prolonged or repeated exposure
H373 - May cause damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H411 - Toxic to aquatic life with long lasting effects
H412 - Harmful to aquatic life with long lasting effects
H413 - May cause long lasting harmful effects to aquatic life

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	Sk*	Skin designation



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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
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method
Corrosive to metals	On basis of test data

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

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGL(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)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization



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

Disclaimer

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End of Safety Data Sheet