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 18-Aug-2025 **Revision Number** 2

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

1.1. Product identifier

Product Code(s) 6610030000

Product Name ICP-OES Wavelength Calibration Solution: 50mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 500mg/L K in 5% HNO3

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 Do not use outside of recommended applications

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 Kindgom

+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 20 3807 3798

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

Denmark	
France	
Hungary	
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]

Corrosive to metals	Category 1 - (H290)
Skin irritation	Category 2 - (H315)
Serious eye damage	Category 1 - (H318)

2.2. Label elements

Contains Nitric Acid

Signal word
Danger

Hazard statements
H290 - May be corrosive to metals.

H315 - Causes skin irritation.
H318 - Causes serious eye damage.

Precautionary Statements - EU (§28, 1272/2008)
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves, eye protection and 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
P321 - Specific treatment (see supplemental first aid instructions on this label)
P390 - Absorb spillage to prevent material damage

2.3. Other hazards

No information available.

PBT & vPvB 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	-	-
Potassium nitrate	-	-
Zink (stabilized)	-	-
Strontium nitrate	-	-
Selenium	-	-
Nickel	-	-
Manganese	-	-
Lead	-	-
Diammonium molybdate	-	-
Copper	-	-
Cobalt	-	-
Chromium (III) nitrate nonahydrate	-	-
Cadmium	-	-
Barium nitrate	-	-
Arsenic	-	-
Aluminum nitrate nonahydrate	-	-

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. (Index No.)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)	Notes
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%	-	-	B
Potassium nitrate 7757-79-1	<0.1	-	231-818-8	Ox. Sol. 3 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335) STOT SE 3 (H336)	-	-	-	-
Zink (stabilized) 7440-66-6	<0.1	-	231-175-3	Acute. Tox. 4 (H302) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	-	-	-	T
Strontium nitrate 10042-76-9	<0.1	-	233-131-9	Ox. Sol. 1 (H271) Eye Dam. 1 (H318)	-	-	-	-
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)	-	-	-	S,7
Manganese 7439-96-5	<0.1	-	231-105-1	Aquatic Chronic 2 (H411)	-	-	-	-
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	-
Diammonium molybdate 13106-76-8	<0.1	-	236-031-3	Acute Tox. 4 (H302) Aquatic Chronic 4 (H413)	-	-	-	-
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 (027-001-00-9)	Acute Tox. 4 (H302) Eye Irrit. 2 (H319) 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)	-	-	-	-

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)	-	-	-	-
Barium nitrate 10022-31-8	<0.1	-	233-020-5 (056-002-00-7)	Ox. Sol. 2 (H272) Acute Tox. 3 (H301) Acute Tox. 4 (H332) Eye Irrit. 2 (H319)	-	-	-	A,1
Arsenic 7440-38-2	<0.1	-	231-148-6 (033-001-00-X)	Acute Tox. 3 (H301) Acute Tox. 3 (H331) Carc. 1A (H350) Repr. 1A (H360) STOT RE 1 (H372) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	-	-	-	-
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)	-	-	-	-

- Substances contained in this mixture with No registration number are under the REACH threshold in Article 6(1) and not subject to the registration requirements according to REACH Title II

CLP Notes:

Note A - Without prejudice to Article 17(2) of Regulation (EC) No 1272/2008, the name of the substance must appear on the label in the form of one of the designations given in Part 3 of Annex VI to that Regulation. In that Part, use is sometimes made of a general description such as "... compounds" or "... salts". In this case, the supplier who places such a substance on the market is required to state on the label the correct name, due account being taken of Section 1.1.1.4 of Annex VI to Regulation (EC) No 1272/2008.

Note B - Some substances (acids, bases, etc.) are placed on the market in aqueous solutions at various concentrations and, therefore, these solutions require different classification and labelling since the hazards vary at different concentrations. In Part 3 entries with Note B have a general designation of the following type: 'nitric acid … %'. In this case the supplier must state the percentage concentration of the solution on the label. Unless otherwise stated, it is assumed that the percentage concentration is calculated on a weight/weight basis.

Note S - This substance may not require a label according to Article 17 of Regulation (EC) No 1272/2008 (see section 1.3 of Annex I to that Regulation).

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.
Note 1 - The concentration stated or, in the absence of such concentrations, the generic concentrations set out in this Regulation are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture.
Note 7 - Alloys containing nickel are classified for skin sensitisation when the release rate of 0.5 µg Ni/cm2/week, as measured by the European Standard reference test method EN 1811, is exceededAlloys containing nickel are classified for skin sensitisation when the release rate of 0.5 µg Ni/cm2/week, as measured by the European Standard reference test method EN 1811, is exceeded.

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
Potassium nitrate 7757-79-1	3015	5005	0.5275	No data available	No data available
Zink (stabilized) 7440-66-6	630	No data available	No data available	No data available	No data available
Strontium nitrate 10042-76-9	2750	No data available	No data available	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
Manganese 7439-96-5	9000	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
Cadmium 7440-43-9	1140	No data available	No data available	No data available	No data available
Barium nitrate 10022-31-8	300	No data available	1.1149	No data available	No data available
Arsenic 7440-38-2	15	No data available	No data available	No data available	No data available

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
Aluminum nitrate nonahydrate 7784-27-2	542.5	No data available	No data available	No data available	No data available

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

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.

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.

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.

Effects of Exposure No information available.

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

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. Do not breathe dust/fume/gas/mist/vapours/spray. 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.

Storage class (TRGS 510) LGK 10.

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	STEL: 1 ppm	STEL 1 ppm	STEL: 1 ppm	STEL: 1 ppm	STEL: 1 ppm

7697-37-2	STEL: 2.6 mg/m³	STEL 2.6 mg/m³	STEL: 2.6 mg/m³	STEL: 2.6 mg/m³	STEL: 2.6 mg/m³
Potassium nitrate 7757-79-1	-		-	TWA: 5.0 mg/m³	-
Strontium nitrate 10042-76-9	-		-	TWA: 1.0 mg/m³	-
Selenium 7782-49-2	-	TWA: 0.1 mg/m³ STEL 0.3 mg/m³	TWA: 0.2 mg/m³	TWA: 0.2 mg/m³	TWA: 0.1 mg/m³
Nickel 7440-02-0	-	Sa+ Sh+	TWA: 0.1 mg/m³ TWA: 0.01 mg/m³	-	TWA: 0.5 mg/m³ Skin Sensitisation
Manganese 7439-96-5	TWA: 0.2 mg/m³ inhalable fraction	TWA: 0.2 mg/m³ STEL 1.6 mg/m³	TWA: 0.05 mg/m³	TWA: 0.2 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead 7439-92-1	TWA: 0.03 mg/m³	TWA: 0.1 mg/m³ STEL 0.4 mg/m³	-	TWA: 0.05 mg/m³	TWA: 0.15 mg/m³
Diammonium molybdate 13106-76-8	-	TWA: 5 mg/m³ STEL 10 mg/m³	TWA: 0.5 mg/m³	TWA: 5.0 mg/m³ TWA: 10.0 mg/m³	TWA: 5 mg/m³ STEL: 10 mg/m³
Copper 7440-50-8	-	TWA: 1 mg/m³ TWA: 0.1 mg/m³ STEL 4 mg/m³ STEL 0.4 mg/m³	TWA: 0.2 mg/m³ TWA: 1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.2 mg/m³ TWA: 1 mg/m³ STEL: 2 mg/m³
Cobalt 7440-48-4	-	Sk* Sa+ Sh+	TWA: 0.02 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ Skin Sensitisation Respiratory Sensitisation
Chromium (III) nitrate nonahydrate 7789-02-8	-		TWA: 0.5 mg/m³	-	-
Cadmium 7440-43-9	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³		TWA: 0.01 mg/m³ TWA: 0.004 mg/m³	TWA: 0.004 mg/m³	TWA: 0.004 mg/m³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ STEL 2 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³
Arsenic 7440-38-2	-		TWA: 0.01 mg/m³	-	TWA: 0.1 mg/m³
Aluminum nitrate nonahydrate 7784-27-2	-		TWA: 2 mg/m³	-	TWA: 2 mg/m³
Chemical name	Cyprus	Czech Republic	Denmark	Estonia	Finland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m³	TWA: 1 mg/m³ Ceiling: 2.5 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	TWA: 0.5 ppm TWA: 1.3 mg/m³ STEL: 1 ppm STEL: 2.6 mg/m³
Selenium 7782-49-2	-	TWA: 0.1 mg/m³ Ceiling: 0.2 mg/m³	TWA: 0.1 mg/m³ STEL: 0.2 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³
Nickel 7440-02-0	-	TWA: 0.05 mg/m³ S+	TWA: 0.05 mg/m³ STEL: 0.1 mg/m³	TWA: 0.5 mg/m³ S+	TWA: 0.01 mg/m³

		Ceiling: 1 mg/m³			
Manganese 7439-96-5	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ Ceiling: 0.4 mg/m³ Ceiling: 0.1 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ STEL: 0.4 mg/m³ STEL: 0.1 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.02 mg/m³
Lead 7439-92-1	TWA: 0.15 mg/m³	TWA: 0.05 mg/m³ Ceiling: 0.2 mg/m³	TWA: 0.05 mg/m³ STEL: 0.1 mg/m³	TWA: 0.1 mg/m³ TWA: 0.05 mg/m³	TWA: 0.1 mg/m³
Diammonium molybdate 13106-76-8	-	TWA: 5 mg/m³ Ceiling: 25 mg/m³	TWA: 5 mg/m³ STEL: 10 mg/m³	TWA: 5 mg/m³	TWA: 0.5 mg/m³
Copper 7440-50-8	-	TWA: 1 mg/m³ TWA: 0.1 mg/m³ Ceiling: 2 mg/m³ Ceiling: 0.2 mg/m³	TWA: 1.0 mg/m³ TWA: 0.1 mg/m³ STEL: 2 mg/m³ STEL: 0.2 mg/m³	TWA: 1 mg/m³ TWA: 0.2 mg/m³	TWA: 0.02 mg/m³
Cobalt 7440-48-4	-	TWA: 0.05 mg/m³ S+ Ceiling: 0.1 mg/m³	TWA: 0.01 mg/m³ STEL: 0.02 mg/m³	TWA: 0.05 mg/m³ S+	TWA: 0.02 mg/m³
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA: 0.5 mg/m³ Ceiling: 1.5 mg/m³	-	TWA: 2 mg/m³	TWA: 0.5 mg/m³
Cadmium 7440-43-9	TWA: 0.001 mg/m³	TWA: 0.004 mg/m³ Sk* Ceiling: 0.008 mg/m³	TWA: 0.001 mg/m³ STEL: 0.002 mg/m³	TWA: 0.004 mg/m³	TWA: 0.004 mg/m³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ Ceiling: 2.5 mg/m³	TWA: 0.5 mg/m³ STEL: 1 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³
Arsenic 7440-38-2	-	TWA: 0.1 mg/m³ Ceiling: 0.4 mg/m³	TWA: 0.0028 mg/m³ STEL: 0.0056 mg/m³	TWA: 0.03 mg/m³ TWA: 0.01 mg/m³	TWA: 0.01 mg/m³
Aluminum nitrate nonahydrate 7784-27-2	-	-	TWA: 1 mg/m³ STEL: 2 mg/m³	TWA: 2 mg/m³	TWA: 2 mg/m³
Chemical name	France	Germany TRGS	Germany DFG	Greece	Hungary
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m³	TWA-AGW; 1 ppm (); TWA-AGW; 2.6 mg/m³ ();	-	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 2.6 mg/m³ STEL: 1 ppm
Zink (stabilized) 7440-66-6	-	-	TWA-MAK: 0.1 mg/m³; I(4);respirable fraction TWA-MAK: 2 mg/m³; I(2);inhalable fraction Peak: 0.4 mg/m³; respirable fraction Peak: 4 mg/m³; inhalable fraction	-	-

Selenium 7782-49-2	-	TWA-AGW; 0.05 mg/m³ (exposure factor 1); inhalable fraction	TWA-MAK: 0.02 mg/m³; II(8);inhalable fraction Peak: 0.16 mg/m³; inhalable fraction Sk	TWA: 0.2 mg/m³	-
Nickel 7440-02-0	TWA: 1 mg/m³	TWA-AGW; 0.03 mg/m³ (exposure factor 8); respirable fraction TWA-AGW; 0.006 mg/m³ (exposure factor 8); inhalable fraction DS	DS RS	TWA: 1 mg/m³	TWA: 0.01 mg/m³ sz+
Manganese 7439-96-5	-	TWA-AGW; 0.2 mg/m³ (exposure factor 8); inhalable fraction TWA-AGW; 0.02 mg/m³ (exposure factor 8); respirable fraction	TWA-MAK: 0.2 mg/m³; II(8);inhalable fraction TWA-MAK: 0.02 mg/m³; II(8);respirable fraction Peak: 1.6 mg/m³; inhalable fraction Peak: 0.16 mg/m³; respirable fraction	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead 7439-92-1	TWA: 0.1 mg/m³	-	TWA-MAK: 0.004 mg/m³; II(8);inhalable fraction Peak: 0.032 mg/m³; inhalable fraction	TWA: 0.15 mg/m³	TWA: 0.1 mg/m³ TWA: 0.05 mg/m³
Diammonium molybdate 13106-76-8	TWA: 5 mg/m³ STEL: 10 mg/m³	-	-	TWA: 5 mg/m³	TWA: 5 mg/m³
Copper 7440-50-8	TWA: 0.2 mg/m³ TWA: 1 mg/m³ STEL: 2 mg/m³	-	TWA-MAK: 0.01 mg/m³; II(2);respirable fraction Peak: 0.02 mg/m³; respirable fraction	TWA: 0.2 mg/m³ TWA: 1 mg/m³ STEL: 2 mg/m³	TWA: 0.1 mg/m³ TWA: 0.01 mg/m³ STEL: 0.2 mg/m³
Cobalt 7440-48-4	-	-	Sk DS RS	TWA: 0.1 mg/m³	TWA: 0.02 mg/m³ sz+
Chromium (III) nitrate nonahydrate 7789-02-8	-	TWA-AGW; 2 mg/m³ (exposure factor 1); inhalable fraction	-	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ TWA: 2 mg/m³ STEL: 2 mg/m³ sz+
Cadmium	TWA: 0.004 mg/m³	TWA-AGW;	Sk	TWA: 0.001 mg/m³	TWA: 0.004 mg/m³

7440-43-9		0.002 mg/m³ (exposure factor 8); inhalable fraction			
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	TWA-AGW; 0.5 mg/m³ (exposure factor 1); inhalable fraction	TWA-MAK: 0.5 mg/m³; II(8);inhalable fraction Peak: 4 mg/m³; inhalable fraction	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³
Arsenic 7440-38-2	-	-	-	TWA: 0.1 mg/m³	TWA: 0.01 mg/m³ Sk*
Aluminum nitrate nonahydrate 7784-27-2	TWA: 2 mg/m³	-	TWA-MAK: 0.0002 mg/m³; I(2);inhalable fraction TWA-MAK: 0.005 mg/m³; II(2);inhalable fraction Peak: 0.0004 mg/m³; inhalable fraction Peak: 0.01 mg/m³; inhalable fraction	TWA: 2 mg/m³	-
Chemical name	Ireland	Italy MDLPS	Italy AIDII	Latvia	Lithuania
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	TWA: 2 ppm TWA: 5.2 mg/m³ STEL: 4 ppm STEL: 10.3 mg/m³	TWA: 0.78 ppm TWA: 2 mg/m³ STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³
Potassium nitrate 7757-79-1	-	-	-	TWA: 5 mg/m³	TWA: 5 mg/m³
Strontium nitrate 10042-76-9	-	-	-	-	TWA: 1 mg/m³
Selenium 7782-49-2	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³	-	TWA: 0.2 mg/m³	-	TWA: 0.1 mg/m³
Nickel 7440-02-0	-	-	TWA: 1.5 mg/m³	-	TWA: 0.5 mg/m³ J+
Manganese 7439-96-5	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ TWA: 0.02 mg/m³ STEL: 0.15 mg/m³ STEL: 0.6 mg/m³ STEL: 3 mg/m³	TWA: 0.21 mg/m³	TWA: 0.02 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead 7439-92-1	TWA: 0.15 mg/m³ STEL: 0.45 mg/m³	TWA: 0.15 mg/m³	TWA: 0.05 mg/m³	-	TWA: 0.15 mg/m³ TWA: 0.07 mg/m³
Diammonium molybdate 13106-76-8	TWA: 10 mg/m³ TWA: 0.5 mg/m³	-	TWA: 0.5 mg/m³	-	TWA: 5 mg/m³ TWA: 10 mg/m³

	STEL: 30 mg/m³ STEL: 1.5 mg/m³				
Copper 7440-50-8	TWA: 0.2 mg/m³ TWA: 1 mg/m³ STEL: 2 mg/m³ STEL: 0.6 mg/m³	-	TWA: 0.2 mg/m³	TWA: 0.5 mg/m³ STEL: 1 mg/m³	TWA: 1 mg/m³ TWA: 0.2 mg/m³
Cobalt 7440-48-4	TWA: 0.02 mg/m³ STEL: 0.06 mg/m³ Sens+	-	TWA: 0.02 mg/m³ senR+ senD+	TWA: 0.5 mg/m³	TWA: 0.05 mg/m³ J+
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 2 mg/m³ STEL: 6 mg/m³	-	TWA: 0.003 mg/m³ senR+ senD+	TWA: 2 mg/m³	-
Cadmium 7440-43-9	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³ STEL: 0.003 mg/m³ STEL: 0.012 mg/m³	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³	TWA: 0.01 mg/m³	-	TWA: 0.004 mg/m³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ Sk*	TWA: 0.5 mg/m³
Arsenic 7440-38-2	TWA: 0.01 mg/m³ STEL: 0.03 mg/m³	-	TWA: 0.01 mg/m³	-	-
Aluminum nitrate nonahydrate 7784-27-2	TWA: 2 mg/m³ STEL: 6 mg/m³	-	-	-	TWA: 1 mg/m³
Chemical name	Luxembourg	Malta	Netherlands	Norway	Poland
Nitric Acid 7697-37-2	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 0.5 ppm STEL: 1.3 mg/m³	TWA: 2 ppm TWA: 5 mg/m³ STEL: 4 ppm STEL: 10 mg/m³	TWA: 1.4 mg/m³ STEL: 2.6 mg/m³
Selenium 7782-49-2	-	-	-	TWA: 0.05 mg/m³ STEL: 0.15 mg/m³ A+	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³
Nickel 7440-02-0	-	-	-	TWA: 0.05 mg/m³ STEL: 0.15 mg/m³ A+	TWA: 0.25 mg/m³
Manganese 7439-96-5	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.5 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ STEL: 0.6 mg/m³ STEL: 0.15 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead 7439-92-1	TWA: 0.15 mg/m³	-	TWA: 0.15 mg/m³	TWA: 0.05 mg/m³ STEL: 0.15 mg/m³	TWA: 0.05 mg/m³
Diammonium molybdate 13106-76-8	-	-	-	TWA: 5 mg/m³ STEL: 10 mg/m³	TWA: 4 mg/m³ STEL: 10 mg/m³
Copper 7440-50-8	-	-	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ TWA: 1 mg/m³	TWA: 0.2 mg/m³

				STEL: 3 mg/m³ STEL: 0.3 mg/m³	
Cobalt 7440-48-4	-	-	TWA: 0.02 mg/m³	TWA: 0.02 mg/m³ STEL: 0.06 mg/m³ A+	TWA: 0.02 mg/m³
Chromium (III) nitrate nonahydrate 7789-02-8	-	-	TWA: 0.06 mg/m³	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 0.5 mg/m³
Cadmium 7440-43-9	-	-	TWA: 0.004 mg/m³	TWA: 0.001 mg/m³ STEL: 0.003 mg/m³	TWA: 0.004 mg/m³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	-	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 0.5 mg/m³
Arsenic 7440-38-2	-	-	TWA: 0.28 µg/m³	TWA: 0.005 mg/m³ STEL: 0.015 mg/m³ Sk*	TWA: 0.01 mg/m³
Aluminum nitrate nonahydrate 7784-27-2	-	-	-	TWA: 2 mg/m³ STEL: 4 mg/m³	-
Chemical name	Portugal	Romania	Slovakia	Slovenia	Spain
Nitric Acid 7697-37-2	TWA: 2 ppm STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	Ceiling: 2.6 mg/m³	TWA: 1 ppm TWA: 2.6 mg/m³ STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³
Zink (stabilized) 7440-66-6	-	-	TWA: 0.1 mg/m³ TWA: 2 mg/m³	-	-
Selenium 7782-49-2	TWA: 0.2 mg/m³	TWA: 0.1 mg/m³ STEL: 0.2 mg/m³	TWA: 0.01 mg/m³	TWA: 0.05 mg/m³ STEL: 0.05 mg/m³	TWA: 0.1 mg/m³
Nickel 7440-02-0	TWA: 1.5 mg/m³	TWA: 0.1 mg/m³ STEL: 0.5 mg/m³	TWA: 0.1 mg/m³ STEL: 0.05 mg/m³ S+	TWA: 0.006 mg/m³ STEL: 0.048 mg/m³	TWA: 1 mg/m³ Sen+
Manganese 7439-96-5	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0,05 mg/m³	TWA: 0.2 mg/m³ STEL: 1.6 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead 7439-92-1	TWA: 0.05 mg/m³	TWA: 0.15 mg/m³	TWA: 0.15 mg/m³ TWA: 0.05 mg/m³	TWA: 0.1 mg/m³ STEL: 0.4 mg/m³	TWA: 0.15 mg/m³
Diammonium molybdate 13106-76-8	TWA: 0.5 mg/m³	TWA: 2 mg/m³ STEL: 5 mg/m³	-	-	TWA: 0.5 mg/m³
Copper 7440-50-8	TWA: 0.2 mg/m³ TWA: 1 mg/m³	TWA: 0.5 mg/m³ STEL: 0.2 mg/m³ STEL: 1.5 mg/m³	TWA: 1 mg/m³ TWA: 0.2 mg/m³	-	TWA: 0.01 mg/m³
Cobalt 7440-48-4	TWA: 0.02 mg/m³	TWA: 0.05 mg/m³ STEL: 0.1 mg/m³	TWA: 0.05 mg/m³ S+	-	TWA: 0.02 mg/m³ Sen+
Chromium (III) nitrate nonahydrate 7789-02-8	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	-	-	-

Cadmium 7440-43-9	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³ STEL: 0.15 mg/m³ STEL: 0.75 mg/m³	TWA: 0.004 mg/m³	TWA: 0.01 mg/m³ TWA: 0.002 mg/m³
Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ STEL: 0.5 mg/m³	TWA: 0.5 mg/m³
Arsenic 7440-38-2	TWA: 0.01 mg/m³	TWA: 0.01 mg/m³ STEL: 0.1 mg/m³	TWA: 0.01 mg/m³	-	TWA: 0.01 mg/m³
Aluminum nitrate nonahydrate 7784-27-2	-	-	TWA: 2 mg/m³	-	-

Chemical name	Sweden	Switzerland	United Kingdom
Nitric Acid 7697-37-2	NGV: 0.5 ppm NGV: 1.3 mg/m³ Bindande KGV: 1 ppm Bindande KGV: 2.6 mg/m³	TWA: 2 ppm TWA: 5 mg/m³ STEL: 2 ppm STEL: 5 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³
Selenium 7782-49-2	NGV: 0.1 mg/m³	TWA: 0.02 mg/m³ STEL: 0.16 mg/m³ Sk*	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³
Nickel 7440-02-0	NGV: 0.5 mg/m³ S+	TWA: 0.5 mg/m³ S+	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³ Sk*
Manganese 7439-96-5	NGV: 0.2 mg/m³ NGV: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.1 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ STEL: 0.6 mg/m³ STEL: 0.15 mg/m³
Lead 7439-92-1	NGV: 0.1 mg/m³ NGV: 0.05 mg/m³	TWA: 0.1 mg/m³ STEL: 0.8 mg/m³	TWA: 0.15 mg/m³ STEL: 0.45 mg/m³
Diammonium molybdate 13106-76-8	NGV: 5 mg/m³ NGV: 10 mg/m³	TWA: 5 mg/m³	TWA: 5 mg/m³ STEL: 10 mg/m³
Copper 7440-50-8	NGV: 0.01 mg/m³	TWA: 0.1 mg/m³ STEL: 0.2 mg/m³	TWA: 1 mg/m³ TWA: 0.2 mg/m³ STEL: 0.6 mg/m³ STEL: 2 mg/m³
Cobalt 7440-48-4	NGV: 0.02 mg/m³ Sk* S+	TWA: 0.05 mg/m³ Sk* S+	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³ Sen+
Chromium (III) nitrate nonahydrate 7789-02-8	NGV: 0.5 mg/m³	TWA: 0.5 mg/m³ S+	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³
Cadmium 7440-43-9	NGV: 0.001 mg/m³ NGV: 0.004 mg/m³	TWA: 0.001 mg/m³ Sk*	TWA: 0.025 mg/m³ STEL: 0.075 mg/m³
Barium nitrate 10022-31-8	NGV: 0.5 mg/m³	TWA: 0.5 mg/m³ STEL: 4 mg/m³	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³
Arsenic	NGV: 0.01 mg/m³	TWA: 0.01 mg/m³	TWA: 0.1 mg/m³

7440-38-2		Sk*	STEL: 0.3 mg/m³
Aluminum nitrate nonahydrate 7784-27-2	NGV: 1 mg/m³	TWA: 2 mg/m³	TWA: 2 mg/m³ STEL: 6 mg/m³

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
Nickel 7440-02-0	-	7 µg/L - urine (spontaneous urine) - after end of work day, at the end of a work week/end of the shift (Note 1)	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 7439-96-5	-	20 µg/L - blood (whole blood) - not provided (Note 1)	-	-	-
Lead 7439-92-1	30 µg/100 mL - blood (Lead) - no restriction 0.015 mg/m³ - air (Lead) - 40 hours per week 15 µg/100 mL - blood (Lead) - no restriction	120 µg/100 mL RBC Erythrocyte protoporphyrin - blood (Ethylenediaminetetraacetic acid) - not provided 30 µg/100 mL blood Lead - blood (Ethylenediaminetetraacetic acid) - not provided 3.8 million/µL Erythrocytes - blood (Ethylenediaminetetraacetic acid) - not provided 12 g/dL Hemoglobin - blood (Ethylenediaminetetraacetic acid) - not provided 35 % Hematocrit - blood (Ethylenediaminetet	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) 70 µg Pb/100 mL - blood (Lead) - if the exposure to the concentration of Lead in the air is greater than 0.075 mg/m³, calculated as a time-weighted average during 40 hours per week, or if	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)

		raacetic acid) - not provided 10 mg/L - urine (.delta.-Aminolevulinic acid) - not provided 3.2 million/µL Erythrocytes - blood (Ethylenediaminetetraacetic acid) - not provided 10 g/dL Hemoglobin - blood (Ethylenediaminetetraacetic acid) - not provided 30 % Hematocrit - blood (Ethylenediaminetetraacetic acid) - not provided 6 mg/L - urine (.delta.-Aminolevulinic acid) - not provided (Note 1)		the level of Lead in the blood of individual workers is greater than 40 µg Pb/100 mL of blood	
Cobalt 7440-48-4	-	10 µg/L - urine (spontaneous urine) - after end of work day, at the end of a work week/end of the shift (Note 1)	-	-	-
Cadmium 7440-43-9	-	2.5 µg/g Creatinine - urine (N-Acetylglucosaminidase) - not provided (Note 1)	-	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	-	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 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	-	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)

		(Note 1)			
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
Selenium 7782-49-2	-	-	-	150 µg/L (serum - Selenium no restriction) 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	150 µg/L (serum - Selenium no restriction)
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 15 µg/L - (end of shift) - urine 30 µg/L - (end of shift) - urine 45 µg/L - (end of shift) - urine	-
Manganese 7439-96-5	-	-	-	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)
Diammonium molybdate 13106-76-8	-	-	-	150 µg/L - BAR (end of exposure or end of shift) urine	-
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 6 µg/L - (end of shift) - urine 15 µg/L - (end of shift) - urine 30 µg/L - (end of shift) - urine 60 µg/L - (end of shift) - urine 300 µg/L - (end of shift) - urine 3 µg/L - (end of shift) - 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 2 µg/g Creatinine - BLW (no restriction in steady state) urine	-
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	- 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	-

		working week or exposure period)		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	

Chemical name	Hungary	Ireland	Italy MDLPS	Italy AIDII
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 7440-38-2	0.05 mg/L (urine - Arsenic end of shift) 0.67 µmol/L (urine - Arsenic end of shift)	35 µg/L (urine - inorganic Arsenic plus methylated metabolites end of workweek)	-	35 µg As/L - urine (Inorganic arsenic plus methylated metabolites) - end of workweek
Chemical name	Latvia	Luxembourg	Romania	Slovakia
Nickel 7440-02-0	-	-	3 µg/L - urine (Nickel) - end of shift	0.03 mg/L (blood - Nickel end of exposure or work shift)
Manganese 7439-96-5	-	-	10 µg/L - urine (Manganese) - end of shift	-
Lead 7439-92-1	-	70 µg/100 mL - blood (Lead) - 0.075 mg/m^3 - air (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	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)

			shift	
Cobalt 7440-48-4	7 µg/L - blood (Cobalt) - at the end of exposure or shift 130 nmol/L - urine (Cobalt) - at the end of exposure or shift	-	15 µg/L - urine (Cobalt) - end of work week 1 µg/L - blood (Cobalt) - end of work week	30 µg/L (urine - Cobalt not critical)
Cadmium 7440-43-9	-	-	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	-
Chemical name	Slovenia	Spain	Switzerland	United Kingdom
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 long-term exposures))	-
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)	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	-	15 µg/L (urine - Cobalt	30 µg/L (urine - Cobalt	-

7440-48-4		end of workweek) 1 µg/L (blood - Cobalt end of workweek)	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)	15 µg/L (urine - total Arsen(III), Arsen(V), Monomethyl arsenic acid end of shift, and after several shifts (for long-term exposures)) 200 nmol/L (urine - total Arsen(III), Arsen(V), Monomethyl arsenic acid end of shift, and 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
Selenium 7782-49-2	-	7 mg/kg bw/day [4] [6]	0.05 mg/m³ [4] [6]
Strontium nitrate 10042-76-9	-	40.1 mg/kg bw/day [4] [6]	7.9 mg/m³ [4] [6]
Nickel 7440-02-0	-	0.035 mg/cm2 [5] [6]	0.05 mg/m³ [4] [6] 0.05 mg/m³ [5] [6] 11.9 mg/m³ [5] [7]
Arsenic 7440-38-2	-	85 µg/kg bw/day [4] [6]	4 µg/m³ [4] [6]
Cadmium 7440-43-9	-	-	4 µg/m³ [5] [6]
Cobalt 7440-48-4	-	-	40 µg/m³ [5] [6]
Copper 7440-50-8	-	137 mg/kg bw/day [4] [6] 273 mg/kg bw/day [4] [7]	-
Zink (stabilized)	-	83 mg/kg bw/day [4] [6]	5 mg/m³ [4] [6]

Chemical name	Oral	Dermal	Inhalation
7440-66-6			

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
Selenium 7782-49-2	4.3 µg/kg bw/day [4] [6]	-	0.015 mg/m³ [4] [6]
Strontium nitrate 10042-76-9	1.2 mg/kg bw/day [4] [6]	-	2.4 mg/m³ [4] [6]
Nickel 7440-02-0	0.011 mg/kg bw/day [4] [6] 0.37 mg/kg bw/day [4] [7]	0.035 mg/cm2 [5] [6]	60 ng/m³ [4] [6] 60 ng/m³ [5] [6] 0.8 mg/m³ [5] [7]
Arsenic 7440-38-2	1.7 µg/kg bw/day [4] [6]	-	2 µg/m³ [4] [6]
Cadmium 7440-43-9	1 µg/kg bw/day [4] [6]	-	-
Cobalt 7440-48-4	29.8 µg/kg bw/day [4] [6]	-	6.3 µg/m³ [5] [6]
Copper 7440-50-8	0.041 mg/kg bw/day [4] [6]	273 mg/kg bw/day [4] [6] 273 mg/kg bw/day [4] [7]	1 mg/m³ [5] [6] 1 mg/m³ [5] [7]
Zink (stabilized) 7440-66-6	0.83 mg/kg bw/day [4] [6]	-	2.5 mg/m³ [4] [6]

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
Barium nitrate	115 µg/L	-	11.5 µg/L	-	-

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
10022-31-8	0.115 mg/L				
Strontium nitrate 10042-76-9	2.1 mg/L	-	-	-	-
Lead 7439-92-1	2.4 µg/L	-	3.3 µg/L	-	-
Nickel 7440-02-0	7.1 µg/L	-	8.6 µg/L	-	-
Arsenic 7440-38-2	13 µg/L	13 µg/L	0.8 µg/L	0.9 µg/L	-
Cadmium 7440-43-9	0.19 µg/L	-	1.14 µg/L	-	-
Cobalt 7440-48-4	0.62 µg/L	-	2.36 µg/L	-	-
Copper 7440-50-8	7.8 µg/L	-	5.2 µg/L	-	-
Zink (stabilized) 7440-66-6	20.6 µg/L	-	6.1 µg/L	-	-

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
Potassium nitrate 7757-79-1	-	-	18 mg/L	-	-
Barium nitrate 10022-31-8	600 mg/kg sediment dw	-	62.2 mg/L	207.7 mg/kg soil dw	-
Strontium nitrate 10042-76-9	1811 mg/kg sediment dw	-	4.2 mg/L	332 mg/kg soil dw	-
Lead 7439-92-1	186 mg/kg sediment dw	168 mg/kg sediment dw	100 µg/L	212 mg/kg soil dw	10.9 mg/kg food
Nickel 7440-02-0	109 mg/kg sediment dw	109 mg/kg sediment dw	0.33 mg/L	29.9 mg/kg soil dw	0.12 mg/kg food
Arsenic 7440-38-2	130 mg/kg sediment dw	8 mg/kg sediment dw	61 µg/L	0.5 mg/kg soil dw	1 mg/kg food
Cadmium 7440-43-9	1.8 mg/kg sediment dw	0.64 mg/kg sediment dw	20 µg/L	0.9 mg/kg soil dw	0.16 mg/kg food
Cobalt 7440-48-4	53.8 mg/kg sediment dw	69.8 mg/kg sediment dw	0.37 mg/L	10.9 mg/kg soil dw	-
Copper 7440-50-8	87 mg/kg sediment dw	676 mg/kg sediment dw	230 µg/L	65 mg/kg soil dw	-
Zink (stabilized)	235.6 mg/kg	121 mg/kg sediment	100 µg/L	106.8 mg/kg soil dw	-

Chemical name	Freshwater sediment	Marine sediment	Sewage treatment	Soil	Food chain
7440-66-6	sediment dw	dw			

8.2. Exposure controls

Personal protective equipment

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

Hand protection Wear protective Neoprene™ gloves. The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374. 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

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

Property	Values	Remarks • Method
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
SADT (°C)	No data available	None known
pH	No data available	None known
pH (as aqueous solution)	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known
Water solubility	No data available	None known
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
No information available

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.

10.6. Hazardous decomposition products

Hazardous decomposition products None known based on information supplied.

SECTION 11: Toxicological information

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

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.

Delayed and immediate effects as well as chronic effects from short and long-term exposure
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 (oral) 99,999.00 mg/kg
ATEmix (dermal) 99,999.00 mg/kg
ATEmix (inhalation-gas) 99,999.00 ppm

ATEmix (inhalation-vapour) 58.90 mg/l
ATEmix (inhalation-dust/mist) 99,999.00 mg/l

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Nitric Acid	-	-	= 2500 ppm (Rat) 1 h ATE (vapours) = 2.65 mg/L
Potassium nitrate	= 3015 mg/kg (Rat)	> 5000 mg/kg (Rat)	> 0.527 mg/L (Rat) 4 h
Zink (stabilized)	= 630 mg/kg (Rat)	-	-
Strontium nitrate	= 2750 mg/kg (Rat)	-	> 4.5 mg/L (Rat) 4 h
Selenium	= 6700 mg/kg (Rat)	-	-
Nickel	> 9000 mg/kg (Rat)	-	> 10.2 mg/L (Rat) 1 h
Manganese	= 9 g/kg (Rat)	-	> 5.14 mg/L (Rat) 4 h
Diammonium molybdate	= 680 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)	-	-
Cadmium	= 1140 mg/kg (Rat)	-	= 25 mg/m³ (Rat) 30 min
Barium nitrate	= 300 mg/kg (Rat)	-	> 1.1 mg/L (Rat) 243 min
Arsenic	= 15 mg/kg (Rat)	-	-
Aluminum nitrate nonahydrate	= 542.5 mg/kg (Rat)	-	-

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

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

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

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

Carcinogenicity Contains a known or suspected carcinogen.

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

Chemical name	European Union
Nickel	Carc. 2
Cobalt	Carc. 1B
Cadmium	Carc. 1B

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

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

Chemical name	European Union
Lead	Repr. 1A Lact.
Cobalt	Repr. 1B
Cadmium	Repr. 2

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

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity The environmental impact of this product has not been fully investigated.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
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)
Strontium nitrate	-	LC50: >97.45mg/L (96h, Cyprinus carpio)	-	-
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)
Manganese	-	LC50: >3.6mg/L (96h, Oncorhynchus mykiss)	-	-

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) LC50: =21.1mg/L (96h, Lepomis macrochirus) LC50: =0.016mg/L (96h, Oryzias latipes) LC50: 0.0004 - 0.003mg/L (96h, Pimephales promelas)	-	EC50: =0.0244mg/L (48h, Daphnia magna)

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation

Chemical name	Partition coefficient
Nitric Acid	-2.3

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
Nitric Acid	The substance is not PBT / vPvB
Potassium nitrate	The substance is not PBT / vPvB
Zink (stabilized)	The substance is not PBT / vPvB
Strontium nitrate	PBT assessment does not apply
Selenium	PBT assessment does not apply
Nickel	The substance is not PBT / vPvB
Manganese	The substance is not PBT / vPvB
Lead	PBT assessment does not apply
Diammonium molybdate	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
Cadmium	PBT assessment does not apply
Barium nitrate	The substance is not PBT / vPvB
Arsenic	PBT assessment does not apply
Aluminum nitrate nonahydrate	PBT assessment does not apply

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.

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)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid), 8, III
14.5 Environmental hazards	No
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)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid), 8, III
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	223, 274
EmS-No.	F-A S-B
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)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid), 8, III
14.5 Environmental hazards	No
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)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid), 8, III, (E)
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1
Tunnel restriction code	(E)

ADN

14.1 UN number or ID number	UN3264
14.2 UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
Description	UN3264, Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid), 8, III
14.5 Environmental hazard	No
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1
Equipment Requirements	PP, EP

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
Zink (stabilized) 7440-66-6	RG 61	-
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	-

Germany

Water hazard class (WGK) slightly hazardous to water (WGK 1)

Chemical Prohibition Ordinance (ChemVerbotsV) This product is subject to requirements and restrictions regarding handling and delivery

Chemical name	ANNEX I
Potassium nitrate 7757-79-1	2.1
Lead 7439-92-1	1.2
Cadmium 7440-43-9	1.2
Barium nitrate 10022-31-8	2.1
Arsenic 7440-38-2	1.2

TA Luft (German Air Pollution Control Regulation)

Chemical name	Number	Class
Selenium	5.2.2	Class II
Nickel	5.2.2 5.2.7.1.1	Class II
Manganese	5.2.2	Class III
Lead	5.2.2	Class II
Copper	5.2.2	Class III
Cobalt	5.2.2 5.2.7.1.1	Class II Class I
Chromium (III) nitrate nonahydrate	5.2.2	Class III
Cadmium	5.2.7.1.1	Class I
Arsenic	5.2.7.1.1	Class I

TRGS 905

Chemical name	Carcinogenicity	Concentration limits (Classification thresholds)	Mutagenicity	Developmental effects	Fertility effects
Cobalt 7440-48-4	Category 1B				

Netherlands

Carcinogenic, mutagenic and reproductive toxic effects

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Mutagens	Netherlands - List of Reproductive Toxins
Selenium - 7782-49-2	-	-	Can be harmful via breastfeeding
Manganese - 7439-96-5	-	-	Fertility Category 2 Development Category 2
Lead - 7439-92-1	-	-	Development Category 1A;powder, particle diameter <1 mm Fertility Category 1A;powder, particle diameter <1 mm Can be harmful via breastfeeding powder, particle diameter <1 mm Development Category 1A;solid, particle diameter >=1 mm Fertility Category 1A;solid, particle diameter >=1 mm Can be harmful via breastfeeding solid, particle diameter >=1 mm
Diammonium molybdate - 13106-76-8	-	-	Fertility Category 2
Cobalt - 7440-48-4	Present	-	Fertility Category 1B
Cadmium - 7440-43-9	Present	-	Fertility Category 1B Development Category 1B Can be harmful via breastfeeding
Arsenic - 7440-38-2	Present	-	Can be harmful via breastfeeding Development Category 1B Fertility Category 1B
Aluminum nitrate nonahydrate - 7784-27-2	-	-	Can be harmful via breastfeeding Development Category 1B

Switzerland

Ordinance on the Incentive Tax on Volatile Organic Compounds (OVOC) SR 814.018 Not applicable

Storage of Hazardous Material SC 8
WPO (GSchV) SR 814.201; WPA (GSchG) SR 814.20 Class B
Major Accidents Ordinance SR 814.012 Not applicable

Chemical name	Threshold quantity
Nitric Acid - 7697-37-2	20000 kg

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
Nitric Acid - 7697-37-2	75	
Zink (stabilized) - 7440-66-6	75	
Strontium nitrate - 10042-76-9	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 28 75	
Cadmium - 7440-43-9	72 23 28 75	
Arsenic - 7440-38-2	75	

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	REPORTABLE EXPLOSIVES

	PRECURSORS - ANNEX I	PRECURSORS - ANNEX II
Nitric Acid - 7697-37-2	3 %w/w	-
Potassium nitrate - 7757-79-1	-	Present

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

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

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 U.S. INVENTORY (TSCA): Listed on inventory. For purposes of 40 CFR 720.36, this product is for Research and Development (R&D) Use Only

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 Chemicals Inventory
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

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
EUH071 - Corrosive to the respiratory tract
EUH201 - Contains lead. Should not be used on surfaces liable to be chewed or sucked by children
H271 - May cause fire or explosion; strong oxidiser
H272 - May intensify fire; oxidiser
H290 - May be corrosive to metals
H301 - Toxic if swallowed
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H319 - Causes serious eye irritation
H330 - Fatal if inhaled
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
H336 - May cause drowsiness or dizziness

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
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves
P302 + P352 - IF ON SKIN: Wash with plenty of water and soap
P321 - Specific treatment (see supplemental first aid instructions on this label)
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P362 + P364 - Take off contaminated clothing and wash it before reuse
P280 - Wear protective gloves, protective clothing, eye protection and 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
P234 - Keep only in original packaging
P390 - Absorb spillage to prevent material damage
P406 - Store in corrosion resistant container with a resistant inner liner

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	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)
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
Sen+	Sensitiser
Sk*	Skin designation
**	Hazard Designation

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	On basis of test data
Serious eye damage/eye irritation	On basis of test data
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
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)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
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)
National Institute of Technology and Evaluation (NITE)
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)
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

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End of Safety Data Sheet