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 17-Jun-2024 **Revision Number** 1.01

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

1.1. Product identifier

Product Code(s)	VHG-ICV1-100
Product Name	CLP Initial Calibration Verification Standard 1 (Second Source): Ag @ 20; Be @ 40; Cd @ 50; Ba, Co, Cu, Fe, Mn, Ni, Pb, Tl, Zn @ 100 µg/mL in 5% HNO3
Form	Not applicable
Unique Formula Identifier (UFI)	6DDR-H0G6-0003-RUF4
Pure substance/mixture	Mixture

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

Recommended use	Laboratory use
Uses advised against	No information available

1.3. Details of the supplier of the safety data sheet

Supplier

LGC Limited
Queens Road
Teddington
Middlesex TW11 0LY
UNITED KINGDOM
:+44 (0) 20 8943 7000
Fax :+44 (0) 20 8943 2767
eMail : gb@lgcstandards.com

Web : www.lgcstandards.com

For further information, please contact

E-mail address	sds-request@lgcgroup.com

1.4. Emergency telephone number

Emergency Telephone	For Hazardous Materials or Dangerous Goods Incident Spill, Leak, Fire Exposure, or Accident Call CHEMTREC: USA & Canada 1-800-424-9300

Rest of the world +1 703-741-5970

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]

Skin corrosion/irritation	Category 2 - (H315)
Serious eye damage/eye irritation	Category 1 - (H318)
Chronic aquatic toxicity	Category 2 - (H411)
Corrosive to metals	Category 1 - (H290)

2.2. Label elements

Signal word
Danger

Hazard statements
H315 - Causes skin irritation
H318 - Causes serious eye damage
H411 - Toxic to aquatic life with long lasting effects
H290 - May be corrosive to metals
EUH071 - Corrosive to the respiratory tract

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
P391 - Collect spillage
P201 - Obtain special instructions before use
P234 - Keep only in original container
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	-	-
Zink (stabilized)	-	-
Thallium	-	-
Nickel	-	-

Manganese(II) nitrate hexahydrate	-	-
Lead	-	-
Ferric nitrate nonahydrate	-	-
Copper	-	-
Cobalt	-	-
Barium nitrate	-	-
Cadmium	-	-
Beryllium Oxyacetate	-	-
Silver	-	-

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%		
Zink (stabilized) 7440-66-6	<0.1	-	231-175-3	Acute. Tox. 4 (H302) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			
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)			
Nickel	<0.1	-	231-111-4	Skin Sens. 1 (H317)			

7440-02-0			(028-002-00-7)	Carc. 2 (H351) STOT RE 1 (H372) Aquatic Chronic 3 (H412)			
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 (027-001-00-9)	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			
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)			
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)			
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)			
Silver 7440-22-4	<0.1	-	231-131-3	Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)			

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
Zink (stabilized) 7440-66-6	630	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
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
Barium nitrate 10022-31-8	355	No data available	1.1138	No data available	No data available
Cadmium 7440-43-9	1140	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
Silver 7440-22-4	5000	2000	5.16	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)

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.

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. 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 Regular cleaning of equipment, work area and clothing is recommended. 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.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions 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. 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.

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/m³	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³	STEL: 1 ppm STEL: 2.6 mg/m³
Thallium 7440-28-0	-	STEL 1 mg/m³	TWA: 0.02 mg/m³ Sk*	TWA: 0.05 mg/m³	-
Nickel 7440-02-0	-	Sa+ Sh+	TWA: 1 mg/m³	TWA: 0.05 mg/m³	TWA: 0.5 mg/m³ Skin Sensitisation
Manganese(II) nitrate hexahydrate 17141-63-8	-	TWA: 0.2 mg/m³ STEL 1.6 mg/m³	TWA: 0.05 mg/m³	TWA: 0.05 mg/m³	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³
Lead	TWA: 0.15 mg/m³	TWA: 0.1 mg/m³	-	TWA: 0.05 mg/m³	TWA: 0.15 mg/m³

7439-92-1		STEL 0.4 mg/m³			
Ferric nitrate nonahydrate 7782-61-8	-	-	TWA: 1 mg/m³	TWA: 1.0 mg/m³	TWA: 1 mg/m³ STEL: 2 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
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
Cadmium 7440-43-9	TWA: 0.001 mg/m³	-	TWA: 0.01 mg/m³ TWA: 0.004 mg/m³	TWA: 0.004 mg/m³	TWA: 0.004 mg/m³
Beryllium Oxyacetate 19049-40-2	-	-	TWA: 0,00005 mg/m³ STEL: 0.01 mg/m³	-	TWA: 0.0006 mg/m³ Sk* Skin Sensitisation
Silver 7440-22-4	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ STEL 0.1 mg/m³ Ceiling: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 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
Thallium 7440-28-0	-	TWA: 0.1 mg/m³ Sk* Ceiling: 0.5 mg/m³	Sk*	-	TWA: 0.1 mg/m³ Sk*
Nickel 7440-02-0	-	TWA: 0.5 mg/m³ S+ Ceiling: 1 mg/m³	TWA: 0.05 mg/m³ STEL: 0.1 mg/m³	TWA: 0.5 mg/m³ S+	TWA: 0.01 mg/m³
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³	TWA: 1 mg/m³ Ceiling: 2 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
Ferric nitrate nonahydrate 7782-61-8	-	-	TWA: 1 mg/m³ STEL: 2 mg/m³	-	TWA: 1 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
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
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
Beryllium Oxyacetate 19049-40-2	-	TWA: 0.001 mg/m³ Ceiling: 0.002 mg/m³	TWA: 0.00002 mg/m³ STEL: 0.00004 mg/m³	-	-
Silver 7440-22-4	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ Ceiling: 0.3 mg/m³	TWA: 0.01 mg/m³ STEL: 0.02 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 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: 1 ppm TWA: 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: 0.1 mg/m³ TWA: 2 mg/m³ Peak: 0.4 mg/m³ Peak: 4 mg/m³	-	-
Thallium 7440-28-0	TWA: 0.1 mg/m³	-	-	TWA: 0.1 mg/m³ Sk*	-
Nickel 7440-02-0	TWA: 1 mg/m³	TWA: 0.03 mg/m³ TWA: 0.006 mg/m³ Sh+	respiratory and skin sensitizer inhalable fraction, respiratory sensitization confirmed for water soluble Nickel compounds only	TWA: 1 mg/m³	TWA: 0.01 mg/m³ sz+
Manganese(II) nitrate hexahydrate 17141-63-8	-	TWA: 0.2 mg/m³ TWA: 0.02 mg/m³	TWA: 0.2 mg/m³ TWA: 0.02 mg/m³ Peak: 1.6 mg/m³ Peak: 0.16 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: 0.1 mg/m³	-	TWA: 0.004 mg/m³ Peak: 0.032 mg/m³	TWA: 0.15 mg/m³	TWA: 0.1 mg/m³ TWA: 0.05 mg/m³
Ferric nitrate nonahydrate 7782-61-8	-	-	-	TWA: 1 mg/m³ STEL: 2 mg/m³	-
Copper 7440-50-8	TWA: 0.2 mg/m³ TWA: 1 mg/m³ STEL: 2 mg/m³	-	TWA: 0.01 mg/m³ Peak: 0.02 mg/m³	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* respiratory and skin sensitizer	TWA: 0.1 mg/m³	TWA: 0.02 mg/m³ sz+

Barium nitrate 10022-31-8	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³ Peak: 4 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³
Cadmium 7440-43-9	TWA: 0.004 mg/m³	TWA: 0.002 mg/m³	Sk*	TWA: 0.001 mg/m³	TWA: 0.004 mg/m³
Beryllium Oxyacetate 19049-40-2	TWA: 0.0006 mg/m³	-	-	TWA: 0.005 mg/m³	TWA: 0.0006 mg/m³ Sk*
Silver 7440-22-4	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ Peak: 0.8 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 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
Thallium 7440-28-0	TWA: 0.02 mg/m³ STEL: 0.06 mg/m³ Sk*	-	TWA: 0.02 mg/m³ Sk*	-	-
Nickel 7440-02-0	TWA: 0.5 mg/m³ STEL: 1.5 mg/m³ Sens+	-	TWA: 1.5 mg/m³	TWA: 0.05 mg/m³	TWA: 0.5 mg/m³ J+
Manganese(II) nitrate hexahydrate 17141-63-8	TWA: 0.2 mg/m³ TWA: 0.05 mg/m³ STEL: 0.6 mg/m³ STEL: 0.15 mg/m³	TWA: 0.05 mg/m³	TWA: 0.1 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: 0.05 mg/m³ STEL: 0.1 mg/m³	TWA: 0.15 mg/m³ TWA: 0.07 mg/m³
Ferric nitrate nonahydrate 7782-61-8	TWA: 1 mg/m³ STEL: 2 mg/m³	-	TWA: 1 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: 0.3 mg/m³ Sens+	-	TWA: 0.02 mg/m³ senR+ senD+	TWA: 0.5 mg/m³	TWA: 0.05 mg/m³ J+
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
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: 0.001 mg/m³	TWA: 0.004 mg/m³
Beryllium Oxyacetate 19049-40-2	TWA: 0.0002 mg/m³ STEL: 0.0006 mg/m³ Sk* Sens+	-	TWA: 0.00005 mg/m³	TWA: 0.001 mg/m³	-

Silver 7440-22-4	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 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
Thallium 7440-28-0	-	-	-	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³ Sk*	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(II) nitrate hexahydrate 17141-63-8	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 STEL: 0.6 ppm 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
Ferric nitrate nonahydrate 7782-61-8	-	-	-	TWA: 1 mg/m³ STEL: 3 mg/m³	-
Copper 7440-50-8	-	-	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ TWA: 1 mg/m³ STEL: 3 mg/m³ STEL: 0.3 mg/m³	TWA: 0.2 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
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
Cadmium 7440-43-9	-	-	TWA: 0.004 mg/m³	TWA: 0.001 mg/m³ STEL: 0.003 mg/m³	TWA: 0.004 mg/m³
Beryllium Oxyacetate 19049-40-2	-	-	Sk*	-	-
Silver 7440-22-4	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³	TWA: 0.05 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	-	-
Thallium	TWA: 0.02 mg/m³	-	TWA: 0.1 mg/m³	-	TWA: 0.1 mg/m³

7440-28-0	Sk*				Sk*
Nickel 7440-02-0	TWA: 1.5 mg/m³	TWA: 0.1 mg/m³ STEL: 0.5 mg/m³	TWA: 0.5 mg/m³ STEL: 0.05 mg/m³ S+	TWA: 0.006 mg/m³ STEL: 0.048 mg/m³	TWA: 1 mg/m³ Sen+
Manganese(II) nitrate hexahydrate 17141-63-8	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 STEL: 0.4 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: 0.5 mg/m³	TWA: 0.1 mg/m³ STEL: 0.4 mg/m³	TWA: 0.15 mg/m³
Ferric nitrate nonahydrate 7782-61-8	TWA: 1 mg/m³	-	-	-	TWA: 1 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+
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
Cadmium 7440-43-9	TWA: 0.001 mg/m³ TWA: 0.004 mg/m³	TWA: 0.001 mg/m³	TWA: 0.03 mg/m³ TWA: 0.15 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
Beryllium Oxyacetate 19049-40-2	STEL: 0.01 mg/m³	TWA: 0.0002 mg/m³	TWA: 0.005 mg/m³ TWA: 0.002 mg/m³ STEL: 0.025 mg/m³ STEL: 0.01 mg/m³	-	TWA: 0.0002 mg/m³
Silver 7440-22-4	TWA: 0.01 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.01 mg/m³ STEL: 0.02 mg/m³	TWA: 0.1 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
Thallium 7440-28-0	-	TWA: 0.1 mg/m³ Sk*	-
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(II) nitrate hexahydrate 17141-63-8	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

Ferric nitrate nonahydrate 7782-61-8	-	TWA: 1 mg/m³	TWA: 1 mg/m³ STEL: 2 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+
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
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
Beryllium Oxyacetate 19049-40-2	NGV: 0.0002 mg/m³ NGV: 0.0006 mg/m³ S+	TWA: 0.0006 mg/m³ S+	TWA: 0.002 mg/m³ STEL: 0.006 mg/m³
Silver 7440-22-4	NGV: 0.1 mg/m³	TWA: 0.1 mg/m³ STEL: 0.8 mg/m³	TWA: 0.1 mg/m³ STEL: 0.3 mg/m³

Biological occupational exposure limits

Chemical name	European Union	Austria	Bulgaria	Croatia	Czech Republic
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 provided) (-)	-	-	-
Lead 7439-92-1	70 µg/100 mL - blood (Lead) - no restriction 0.075 mg/m³ - air (Lead) - 40 hours per week 40 µg/100 mL -	Check 120 µg/100 mL RBC Erythrocyte protoporphyrin (blood - Ethylenediaminetetraacetic acid not	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)	13 µmol/mmol Creatinine (urine - 5-Aminolevulinic acid discretionary) 0.035 µmol/mmol Creatinine (urine - Coproporphyrin

	blood (Lead) - no restriction	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 - Ethylenediaminetetraacetic 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)		- not critical 1.50 mg/LE - blood (Protoporphyrin in erythrocytes) - after exposure during 2-3 months (sample protected from light)	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)
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)
Chemical name	Denmark	Finland	France	Germany DFG	Germany TRGS
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	-
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)	400 µg/L - blood (Lead) - 180 µg/L - blood (Lead) - indifferent sampling time	150 µg/L (whole blood - Lead no restriction) 150 µg/L - BAT (no restriction in steady	150 µg/L (whole blood - Lead no restriction)

		40 µg/dL (blood - Lead)	300 µg/L - blood (Lead) - 200 µg/L - blood (Lead) - 100 µg/L - blood (Lead) -	state) blood 30 µg/L - BAR (no restriction in steady state) blood 40 µg/L - BAR (no restriction in steady state) blood	
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	-
Barium nitrate 10022-31-8	-	-	-	10 µg/L - BAR (for long-term exposures: at the	-

				end of the shift after several shifts) 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	-

Chemical name	Hungary	Ireland	Italy MDLPS	Italy AIDII
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

Chemical name	Latvia	Luxembourg	Romania	Slovakia
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/m³ - 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	400 µg/L (blood - Lead not critical) 100 µg/L (blood - Lead not critical) 15 mg/L (urine - .delta.-Aminolevulinic acid

			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	not critical) 6 mg/L (urine - .delta.-Aminolevulinic acid not critical) 0.30 mg/L (urine - Coproporphyrins not critical)
Cobalt 7440-48-4	-	-	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/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)
Chemical name	Slovenia	Spain	Switzerland	United Kingdom
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 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	2 µg/g creatinine (urine - Cadmium no restrictions) 2.01 nmol/mmol	-

		not critical)	creatinine (urine - Cadmium no restrictions)	

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

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

Skin and body protection Long sleeved clothing. Wear suitable protective 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 Regular cleaning of equipment, work area and clothing is recommended. 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.

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

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	No data available	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
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.

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)	99,999.00 mg/kg
ATEmix (dermal)	99,999.00 mg/kg
ATEmix (inhalation-gas)	99,999.00 ppm
ATEmix (inhalation-dust/mist)	99,999.00 mg/l
ATEmix (inhalation-vapour)	58.90 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
Zink (stabilized)	= 630 mg/kg (Rat)		
Nickel	> 9000 mg/kg (Rat)		> 10.2 mg/L (Rat) 1 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
Barium nitrate	= 355 mg/kg (Rat)		> 1.1 mg/L (Rat) 243 min
Cadmium	= 1140 mg/kg (Rat)		= 25 mg/m³ (Rat) 30 min
Silver	> 5000 mg/kg (Rat)	> 2000 mg/kg (rat)	> 5.16 mg/L (Rat) 4 h

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.

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

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
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
Lead	Repr. 1A Lact.
Cobalt	Repr. 1B
Cadmium	Repr. 2

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 No information available.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity 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
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)
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	LC50: 0.0068 -	-	EC50: =0.03mg/L (48h,

	(96h, Pseudokirchneriella subcapitata) EC50: 0.0426 - 0.0535mg/L (72h, Pseudokirchneriella subcapitata)	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)		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)
Silver	-	LC50: 0.00155 - 0.00293mg/L (96h, Pimephales promelas) LC50: =0.0062mg/L (96h, Oncorhynchus mykiss) LC50: =0.064mg/L (96h, Lepomis macrochirus)	-	EC50: =0.00024mg/L (48h, Daphnia magna)

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

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
Zink (stabilized)	The substance is not PBT / vPvB
Nickel	The substance is not PBT / vPvB
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
Barium nitrate	The substance is not PBT / vPvB
Cadmium	PBT assessment does not apply
Silver	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)
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	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)
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, 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)
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, 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)
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), Environmentally Hazardous
14.5 Environmental hazards	Yes
14.6 Special precautions for user	
Special Provisions	274
Classification code	C1
Tunnel restriction code	(E)

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	-
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	-

Water hazard class (WGK) strongly hazardous to water (WGK 3)

Netherlands

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
Manganese(II) nitrate hexahydrate	-	-	Fertility Category 2 Development Category 2
Lead	-	-	Fertility Category 1A Development Category 1A

Chemical name	Netherlands - List of Carcinogens	Netherlands - List of Carcinogens	Netherlands - List of Reproductive Toxins
			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
Beryllium Oxyacetate	Present	-	-

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 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: 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.	
Zink (stabilized) - 7440-66-6	75.	
Thallium - 7440-28-0	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.	
Silver - 7440-22-4	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)
E2 - Hazardous to the Aquatic Environment in Category Chronic 2

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

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
KECI	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

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
H272 - May intensify fire; oxidiser
H290 - May be corrosive to metals
H300 - Fatal if swallowed
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
H341 - Suspected of causing genetic defects
H350 - May cause cancer
H351 - Suspected of causing cancer

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

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
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

Revision date 17-Jun-2024

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006
Disclaimer
The information in this safety data sheet (SDS) has been prepared with due care and is true and accurate to the best of our knowledge. The user must determine the suitability of the information for its particular purpose, ensure compliance with existing laws and regulations, and be aware that other or additional safety or performance considerations may arise when using, handling and/ or storing the material. The information in this SDS does not purport to be all inclusive or a guarantee as to the properties of the material supplied, and should be used only as a guide. LGC makes no warranties or representations as to the accuracy and completeness of the information contained herein, shall not be held responsible for the suitability of this information for the user's intended purposes or the consequences of such use, and shall not be liable for any damage or loss, howsoever arising, direct or otherwise.

End of Safety Data Sheet