



ICP Calibration Standard Solution ; Quality Control - 23 components; 1000ug/ml each of Ag ; Al ; B ; Ba ; Bi ; Ca ; Cd ; Co ; Cr ; Cu ; Fe ; Ga ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Sr ; Tl ; Zn in HNO₃ 10% Equivalent to Jobin Yvon Ref: JYICP-MIX23

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 09/10/2016

Revision date: 09/10/2016

Version: 1.1

SECTION 1: Identification

1.1. Identification

Product form : Mixture
Name : ICP Calibration Standard Solution ; Quality Control - 23 components; 1000ug/ml each of Ag ; Al ; B ; Ba ; Bi ; Ca ; Cd ; Co ; Cr ; Cu ; Fe ; Ga ; In ; K ; Li ; Mg ; Mn ; Na ; Ni ; Pb ; Sr ; Tl ; Zn in HNO₃ 10% Equivalent to Jobin Yvon Ref: JYICP-MIX23
Product code : EQ0051

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

Use of the substance/mixture : Certified reference material for laboratory use

1.3. Details of the supplier of the safety data sheet

Spectracer UK Ltd.

Second Floor,
27 Gloucester Place,
London,
W1U 8HU,
United Kingdom.

Tel: +44 (0) 207 193 9114

Fax: +44 (0) 203 432 4686

Email: contact@spectracer.co.uk

Web: www.spectracer.com

1.4. Emergency telephone number

Emergency number : Tel: +44(0)1933445260 Option 1. Language: English only.
For Chemical Emergencies Only
Llewellyn (Safety Advisors) Europe Ltd

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Corrosive to metals	H290
Category 1	
Skin corrosion/irritation	H314
Category 1A	
Respiratory sensitisation	H334
Category 1	
Skin sensitization	H317
Category 1	
Carcinogenicity	H350
Category 1A	
Reproductive toxicity	H360
Category 1A	
Hazardous to the aquatic environment - Acute Hazard Category 1	H400
Hazardous to the aquatic environment - Chronic Hazard Category 2	H411

Full text of H statements : see section 16

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2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H350 - May cause cancer
H360 - May damage fertility or the unborn child
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US)

: P202 - Do not handle until all safety precautions have been read and understood
P234 - Keep only in original container
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P272 - Contaminated work clothing must not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P284 - In case of inadequate ventilation wear respiratory protection
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
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/doctor/...
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P342+P311 - If experiencing respiratory symptoms: Call a poison center/doctor/...
P363 - Wash contaminated clothing before reuse
P390 - Absorb spillage to prevent material damage
P405 - Store locked up
P501 - Dispose of contents/container to ..

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

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Name	Product identifier	%	GHS-US classification
nitric acid	(CAS No) 7697-37-2	5 - 15	Ox. Liq. 3, H272 Met. Corr. 1, H290 Skin Corr. 1A, H314
aluminium nitrate	(CAS No) 13473-90-0	1 - 5	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Aquatic Acute 2, H401
boric acid	(CAS No) 10043-35-3	0.1 - 1	Repr. 1B, H360
chromium(III) nitrate	(CAS No) 13548-38-4	0.1 - 1	Skin Sens. 1, H317
iron(III) nitrate	(CAS No) 10421-48-4	0.1 - 1	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335
manganese(II)nitrate	(CAS No) 10377-66-9	0.1 - 1	Skin Irrit. 2, H315 Eye Irrit. 2A, H319
nickel nitrate	(CAS No) 13138-45-9	0.1 - 1	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1A, H350 Repr. 1B, H360 STOT RE 1, H372 Aquatic Acute 3, H402 Aquatic Chronic 3, H412
cobalt dinitrate	(CAS No) 10141-05-6	0.1 - 1	Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 2, H351 Repr. 1B, H360 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Indium(III) nitrate, pentahydrate	(CAS No) 13465-14-0	0.1 - 1	Skin Irrit. 2, H315 Eye Irrit. 2A, H319
cadmium nitrate	(CAS No) 10325-94-7	0.1 - 1	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Carc. 1A, H350 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
barium nitrate	(CAS No) 10022-31-8	0.1 - 1	Acute Tox. 4 (Oral), H302
lead nitrate	(CAS No) 10099-74-8	0.1 - 1	Carc. 1B, H350 Repr. 1A, H360 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
silver nitrate	(CAS No) 7761-88-8	0.1 - 1	Ox. Sol. 2, H272 Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
thallium(I)nitrate	(CAS No) 10102-45-1	0.1 - 1	Acute Tox. 2 (Oral), H300 STOT RE 2, H373 Aquatic Acute 2, H401 Aquatic Chronic 2, H411

Full text of hazard classes and H-statements : see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Call a physician immediately.
- First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or a doctor.

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|---------------------------------------|--|
| First-aid measures after skin contact | : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. Call a physician immediately. |
| First-aid measures after eye contact | : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately. |
| First-aid measures after ingestion | : Rinse mouth. Do not induce vomiting. Call a physician immediately. |

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

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|--------------------------------------|--|
| Symptoms/injuries after inhalation | : May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Symptoms/injuries after skin contact | : Burns. May cause an allergic skin reaction. |
| Symptoms/injuries after eye contact | : Serious damage to eyes. |
| Symptoms/injuries after ingestion | : Burns. |

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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| Suitable extinguishing media | : Water spray. Dry powder. Foam. Carbon dioxide. |
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5.2. Special hazards arising from the substance or mixture

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| Reactivity | : The product is non-reactive under normal conditions of use, storage and transport. |
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5.3. Advice for firefighters

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| Protection during firefighting | : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing. |
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

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|----------------------|---|
| Emergency procedures | : Only qualified personnel equipped with suitable protective equipment may intervene. Do not breathe dust/fume/gas/mist/vapors/spray. |
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6.1.2. For emergency responders

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|----------------------|---|
| Protective equipment | : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection". |
|----------------------|---|

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- | | |
|-------------------------|---|
| For containment | : Collect spillage. |
| Methods for cleaning up | : Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters. |
| Other information | : Dispose of materials or solid residues at an authorized site. |

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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|-------------------------------|---|
| Precautions for safe handling | : Ensure good ventilation of the work station. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Wear personal protective equipment. Floors, walls and other surfaces in the hazard area must be cleaned regularly. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes. |
|-------------------------------|---|

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Hygiene measures : Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in corrosive resistant container with a resistant inner liner. Keep only in original container. Store locked up. Store in a well-ventilated place. Keep cool.

Incompatible materials : Metals.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

nitric acid (7697-37-2)		
ACGIH	ACGIH TWA (ppm)	2 ppm
ACGIH	ACGIH STEL (ppm)	4 ppm
ACGIH	Remark (ACGIH)	URT & eye irr; dental erosion
OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	2 ppm
silver nitrate (7761-88-8)		
ACGIH	ACGIH TWA (mg/m ³)	0.01 mg/m ³ (Silver Soluble compounds, as Ag; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Not applicable		
aluminium nitrate (13473-90-0)		
Not applicable		
boric acid (10043-35-3)		
ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (Borate compounds, inorganic; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Inhalable fraction)
ACGIH	ACGIH STEL (mg/m ³)	6 mg/m ³ (Borate compounds, inorganic; USA; Short time value; TLV - Adopted Value; Inhalable fraction)
barium nitrate (10022-31-8)		
ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (Barium, soluble compounds, as Ba; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
OSHA	OSHA PEL (TWA) (mg/m ³)	0.5 mg/m ³
cadmium nitrate (10325-94-7)		
ACGIH	ACGIH TWA (mg/m ³)	0.01 mg/m ³ (Cadmium, compounds, as Cd; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Cadmium, compounds, as Cd; 0.002 mg/m ³ ; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Respirable fraction)
Not applicable		
cobalt dinitrate (10141-05-6)		
ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³ (Cobalt, inorganic compounds, as Co; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Not applicable		
chromium(III) nitrate (13548-38-4)		
ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (Chromium, inorganic Cr III compounds; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)

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chromium(III) nitrate (13548-38-4)		
Not applicable		
iron(III) nitrate (10421-48-4)		
ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (Iron salts, soluble, as Fe; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
Not applicable		
Indium(III) nitrate, pentahydrate (13465-14-0)		
ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³
ACGIH	Remark (ACGIH)	Pulm edema; pneumonitis
manganese(II)nitrate (10377-66-9)		
ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³
ACGIH	Remark (ACGIH)	CNS impair; A4
nickel nitrate (13138-45-9)		
ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³ (Nickel, Soluble inorganic compounds (NOS), as Ni; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Inhalable fraction)
Not applicable		
lead nitrate (10099-74-8)		
ACGIH	ACGIH TWA (mg/m ³)	0.05 mg/m ³ (Lead, inorganic compounds, as Pb; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
ACGIH	Remark (ACGIH)	CNS & PNS impair
thallium(I)nitrate (10102-45-1)		
ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³
ACGIH	Remark (ACGIH)	dam; peripheral neuropathy
OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Personal protective equipment : Avoid all unnecessary exposure. Gloves. Safety glasses. Protective clothing.



Hand protection : Protective gloves.
Eye protection : Safety glasses.
Skin and body protection : Wear suitable protective clothing.
Respiratory protection : Wear respiratory protection.
Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

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Color	: Mixture contains one or more component(s) which have the following colour(s): colorless to yellow On exposure to light: red-brown Colourless to grey On exposure to light: dark grey to black White Colourless or white Colourless to white Colorless Light red Light green Blue-green Light violet Colourless-white Colourless to light rose Green White or colourless
Odor	: There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure. Mixture contains one or more component(s) which have the following odour(s): irritating/pungent odor asphyxiating odor Odorless No data available on odour Mild odour
Odor threshold	: No data available
pH	: No data available
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: Not applicable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: 1.09
Solubility	: Miscible with water.
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

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silver nitrate (7761-88-8)	
LD50 oral rat	1173 mg/kg (Rat)
ATE US (oral)	1173.000 mg/kg body weight
aluminium nitrate (13473-90-0)	
ATE US (oral)	500.000 mg/kg body weight
boric acid (10043-35-3)	
LD50 oral rat	2660 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Literature study; >2600 mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rabbit	> 2000 mg/kg Rabbit; Experimental value; FIFRA (40 CFR)
ATE US (oral)	2660.000 mg/kg body weight
barium nitrate (10022-31-8)	
LD50 oral rat	355 mg/kg (Rat)
ATE US (oral)	355.000 mg/kg body weight
cadmium nitrate (10325-94-7)	
LD50 oral rat	300 mg/kg (Rat)
ATE US (oral)	300.000 mg/kg body weight
ATE US (dermal)	1100.000 mg/kg body weight
ATE US (gases)	4500.000 ppmV/4h
ATE US (vapors)	11.000 mg/l/4h
ATE US (dust, mist)	1.500 mg/l/4h
chromium(III) nitrate (13548-38-4)	
LD50 oral rat	3250 mg/kg (Rat)
ATE US (oral)	3250.000 mg/kg body weight
nickel nitrate (13138-45-9)	
ATE US (oral)	500.000 mg/kg body weight
ATE US (gases)	4500.000 ppmV/4h
ATE US (vapors)	11.000 mg/l/4h
ATE US (dust, mist)	1.500 mg/l/4h
lead nitrate (10099-74-8)	
LD50 oral rat	4665 mg/kg body weight (Rat; Equivalent or similar to OECD 401; Read-across; 5610 mg/kg bodyweight; Rat; Equivalent or similar to OECD 401; Read-across)
ATE US (oral)	4665.000 mg/kg body weight
thallium(I)nitrate (10102-45-1)	
ATE US (oral)	5.000 mg/kg body weight
Skin corrosion/irritation	: Causes severe skin burns and eye damage.
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified
Carcinogenicity	: May cause cancer.
cadmium nitrate (10325-94-7)	
IARC group	1 - Carcinogenic to humans
cobalt dinitrate (10141-05-6)	
IARC group	2B - Possibly carcinogenic to humans
chromium(III) nitrate (13548-38-4)	
IARC group	3 - Not classifiable

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lead nitrate (10099-74-8)	
IARC group	2A - Probably carcinogenic to humans

Reproductive toxicity : May damage fertility or the unborn child.

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Symptoms/injuries after skin contact : Burns. May cause an allergic skin reaction.

Symptoms/injuries after eye contact : Serious damage to eyes.

Symptoms/injuries after ingestion : Burns.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

nitric acid (7697-37-2)	
EC50 Daphnia 1	180 mg/l (EC50; 48 h)
LC50 fish 2	72 ppm (LC50; 96 h)
Threshold limit algae 1	> 19 mg/l (EC0)

silver nitrate (7761-88-8)	
EC50 Daphnia 1	0.0006 mg/l (EC50; 48 h)
LC50 fish 2	0.006 mg/l (LC50; 96 h; <i>Salmo gairdneri</i>)

aluminium nitrate (13473-90-0)	
LC50 fish 1	4.25 mg/l (LC50; 96 h)

barium nitrate (10022-31-8)	
LC50 fish 1	> 1000 mg/l (LC50; 96 h)

cadmium nitrate (10325-94-7)	
EC50 Daphnia 1	0.04 mg/l (EC50; 48 h)
LC50 fish 2	0.055 mg/l (LC50; 48 h)

cobalt dinitrate (10141-05-6)	
LC50 fish 1	0.490 mg/l (LC50; 672 h)
EC50 Daphnia 2	0.021 mg/l (EC50; 48 h)
Threshold limit algae 1	0.018 mg/l (EC50; 96 h)

nickel nitrate (13138-45-9)	
LC50 fish 1	17.1 mg/l (LC50; 672 h)
Threshold limit algae 1	0.18 mg/l (EC50; 72 h)

lead nitrate (10099-74-8)	
EC50 Daphnia 1	0.3 mg/l (LC50; 48 h)
LC50 fish 2	7.48 mg/l (TLm; 96 h)
Threshold limit algae 1	0.14 mg/l (EC50)

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thallium(I)nitrate (10102-45-1)	
LC50 fish 1	180 mg/l (LC50)
EC50 Daphnia 1	1.6 mg/l (EC50; 24 h)

12.2. Persistence and degradability

nitric acid (7697-37-2)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

silver nitrate (7761-88-8)	
Persistence and degradability	Biodegradability: Not applicable. May cause long-term adverse effects in the environment.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

aluminium nitrate (13473-90-0)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

boric acid (10043-35-3)	
Persistence and degradability	Biodegradability: Not applicable. Biodegradability in soil: Not applicable. No (test)data available on mobility of the substance.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

barium nitrate (10022-31-8)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

cadmium nitrate (10325-94-7)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

cobalt dinitrate (10141-05-6)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

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chromium(III) nitrate (13548-38-4)	
Persistence and degradability	Biodegradability: Not applicable. Adsorbs into the soil.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

iron(III) nitrate (10421-48-4)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

manganese(II)nitrate (10377-66-9)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

nickel nitrate (13138-45-9)	
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

lead nitrate (10099-74-8)	
Persistence and degradability	Biodegradability: Not applicable. Adsorbs into the soil.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

thallium(I)nitrate (10102-45-1)	
Persistence and degradability	Biodegradability: Not applicable. Adsorbs into the soil.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

12.3. Bioaccumulative potential

nitric acid (7697-37-2)	
BCF fish 1	<= 1 (BCF)
Log Pow	-2.3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Bioaccumulation: Not applicable.

silver nitrate (7761-88-8)	
BCF fish 1	11 - 19 (BCF)
BCF fish 2	15 - 150 (BCF)
Log Pow	0.19 (Estimated value)
Bioaccumulative potential	Low bioaccumulation potential (BCF < 500). Not established.

aluminium nitrate (13473-90-0)	
Bioaccumulative potential	Not bioaccumulative.

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boric acid (10043-35-3)	
BCF fish 2	< 0.1 (BCF; 60 days; Oncorhynchus tshawytscha; Flow-through system; Fresh water; Weight of evidence)
Log Pow	-1.09 (Experimental value; EU Method A.8: Partition Coefficient; 22 °C)
Bioaccumulative potential	Low bioaccumulation potential (BCF < 500).
barium nitrate (10022-31-8)	
Bioaccumulative potential	Not bioaccumulative.
cadmium nitrate (10325-94-7)	
BCF other aquatic organisms 1	1220 (BCF)
BCF other aquatic organisms 2	603 (BCF; 504 h)
Bioaccumulative potential	bioaccumulative.
cobalt dinitrate (10141-05-6)	
Bioaccumulative potential	Bioaccumulation: No data available.
chromium(III) nitrate (13548-38-4)	
BCF other aquatic organisms 1	17000 (BCF)
BCF other aquatic organisms 2	6500 (BCF)
Bioaccumulative potential	Bioaccumulation: No data available.
iron(III) nitrate (10421-48-4)	
Bioaccumulative potential	Not bioaccumulative.
manganese(II)nitrate (10377-66-9)	
Bioaccumulative potential	Bioaccumulation: No data available.
lead nitrate (10099-74-8)	
Bioaccumulative potential	bioaccumulative.

12.4. Mobility in soil

boric acid (10043-35-3)	
Ecology - soil	May be harmful to plant growth, blooming and fruit formation.

12.5. Other adverse effects

Effect on the global warming : No known effects from this product.
GWPmix comment : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT
Transport document description : UN2031 Nitric acid other than (red fuming, with not more than 20 percent nitric acid), 8, II
UN-No.(DOT) : UN2031
Proper Shipping Name (DOT) : Nitric acid other than
red fuming, with not more than 20 percent nitric acid
Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

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Packing group (DOT) : II - Medium Danger
Hazard labels (DOT) : 8 - Corrosive



Dangerous for the environment : Yes
Marine pollutant : Yes



DOT Packaging Non Bulk (49 CFR 173.xxx) : 158
DOT Packaging Bulk (49 CFR 173.xxx) : 242
DOT Special Provisions (49 CFR 172.102) : A6 - For combination packaging, if plastic inner packaging are used, they must be packed in tightly closed metal receptacles before packing in outer packaging
B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized
B47 - Each tank may have a reclosing pressure relief device having a start-to-discharge pressure setting of 310 kPa (45 psig)
B53 - Packaging must be made of either aluminum or steel
IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized
T8 - 4 178.274(d)(2) Normal..... Prohibited
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively
TP12 - This material is considered highly corrosive to steel

DOT Packaging Exceptions (49 CFR 173.xxx) : None
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L
DOT Vessel Stowage Location : D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded

Emergency Response Guide (ERG) Number : 157
Other information : No supplementary information available.

TDG

Transport document description : UN2031 NITRIC ACID (other than red fuming, with less than 65% nitric acid), 8, II
UN-No. (TDG) : UN2031
Proper Shipping Name (TDG) : NITRIC ACID
TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
Packing group : II - Medium Danger
Explosive Limit and Limited Quantity Index : 1 L

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Passenger Carrying Road Vehicle or Passenger : Forbidden
Carrying Railway Vehicle Index
Passenger Carrying Ship Index : Forbidden

Transport by sea

UN-No. (IMDG) : 2031
Proper Shipping Name (IMDG) : NITRIC ACID
Class (IMDG) : 8 - Corrosive substances
Packing group (IMDG) : II - substances presenting medium danger
Limited quantities (IMDG) : 1 L
Marine pollutant : Yes



Air transport

UN-No. (IATA) : 2031
Proper Shipping Name (IATA) : Nitric acid
Class (IATA) : 8 - Corrosives
Packing group (IATA) : II - Medium Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

nitric acid (7697-37-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb
silver nitrate (7761-88-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	1 lb
aluminium nitrate (13473-90-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
boric acid (10043-35-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
barium nitrate (10022-31-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
cadmium nitrate (10325-94-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
cobalt dinitrate (10141-05-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
chromium(III) nitrate (13548-38-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

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iron(III) nitrate (10421-48-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Not subject to reporting requirements of the United States SARA Section 313	
CERCLA RQ	1000 lb
Indium(III) nitrate, pentahydrate (13465-14-0)	
Not listed on the United States TSCA (Toxic Substances Control Act) inventory	
manganese(II)nitrate (10377-66-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
nickel nitrate (13138-45-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	100 lb
lead nitrate (10099-74-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	10 lb
thallium(I)nitrate (10102-45-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	100 lb

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

No additional information available

SECTION 16: Other information

Revision date : 09/10/2016

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Full text of H-phrases:

H272	May intensify fire; oxidizer
H290	May be corrosive to metals
H300	Fatal if swallowed
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
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
H401	Toxic to aquatic life
H402	Harmful 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

NFPA health hazard

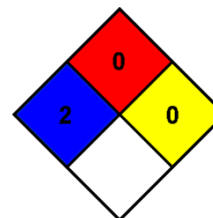
: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health

: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures

* - Chronic (long-term) health effects may result from repeated overexposure

Flammability

: 0 Minimal Hazard - Materials that will not burn

Physical

: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection

: C

C - Safety glasses, Gloves, Synthetic apron

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.