Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name

- **Inconel, Incoloy, Incoclad, Monel, Udimet, Udimar, Nilo, Nilomag, Nimonic, Nimoloy, Nickel Depolarized and Duravanic Nickel, Electroformed Nickel Foil, Cupro 107, Mixed Nickel Rivert, Permanickel, Duranickel**

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

Relevant identified use(s)

- Primarily used in process, industrial, aerospace, automotive, Marine, Electrical or electronic equipment

1.3 Details of the supplier of the safety data sheet

Manufacturer

- Special Metals

  3200 Riverside Drive
  Huntington, WV 25705
  United States

Telephone (General)

- 304-526-5100

1.4 Emergency telephone number

Manufacturer

- 304-526-5780

Manufacturer

- +44(0)1432 382200 - In the UK

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP

- As shipped, these complex alloys in massive form have no known toxicological properties other than causing allergic reactions in individuals sensitive to the metals contained in the alloys. Hazardous fume or dust emissions may be released during remelting, grinding, cutting or welding. The classifications below are related to exposure to the hazardous fume or dust emissions generated remelting, grinding, cutting or welding.
  Skin Sensitization 1 - H317
  Respiratory Sensitization 1 - H334
  Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
  Carcinogenicity 1B - H350
  Reproductive Toxicity 2 - H361d
  Specific Target Organ Toxicity Repeated Exposure 1 - H372
  Specific Target Organ Toxicity Repeated Exposure 2 - H373

DSD/DPD

- As shipped, these complex alloys in massive form have no known toxicological properties other than causing allergic reactions in individuals sensitive to the metals contained in the alloys. Hazardous fume or dust emissions may be released during

remelting, grinding, cutting or welding. The classifications below are related to exposure to the hazardous fume or dust emissions generated remelting, grinding, cutting or welding.
Toxic (T)
Irritant (Xi)
Harmful (Xn)
Carcinogenic Substances - Category 2
Substances Toxic To Reproduction - Category 3
R22, R37, R42/43, R48/23, R49, R63

2.2 Label Elements

CLP

DANGER

Hazard statements

- H317 - May cause an allergic skin reaction
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 - May cause respiratory irritation
- H350 - May cause cancer.
- H361d - Suspected of damaging the unborn child.
- H372 - Causes damage to organs through prolonged or repeated exposure.
- H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention

- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P260 - Do not breathe dust.
- P264 - Wash thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P271 - Use only outdoors or in a well-ventilated area.
- P281 - Use personal protective equipment as required.
- P285 - In case of inadequate ventilation wear respiratory protection.

Response

- P304+P341 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
- P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
- P321 - Specific treatment, see supplemental first aid information.
- P363 - Wash contaminated clothing before reuse.
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
- P308+P313 - IF exposed or concerned: Get medical advice/attention.

Storage/Disposal

- P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
- P405 - Store locked up.
- P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD

Risk phrases

- R22 - Harmful if swallowed.
- R37 - Irritating to respiratory system.
- R42/43 - May cause sensitisation by inhalation and skin contact.
- R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation.
- R49 - May cause cancer by inhalation.
- R63 - Possible risk of harm to the unborn child.

Safety phrases

- S37 - Wear suitable gloves.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S53 - Avoid exposure - obtain special instructions before use.

2.3 Other Hazards

CLP

- Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain. According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD

- Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain. According to European Directive 1999/45/EC this material is considered dangerous.

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012

- As shipped, these complex alloys in massive form have no known toxicological properties other than causing allergic reactions in individuals sensitive to the metals contained in the alloys. Hazardous fume or dust emissions may be released during remelting, grinding, cutting or welding. The classifications below are related to exposure to the hazardous fume or dust emissions generated remelting, grinding, cutting or welding.
  Skin Sensitization 1A
  Eye Irritation 2
  Respiratory Sensitization 1
  Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
  Carcinogenicity 1A
  Reproductive Toxicity 2
  Specific Target Organ Toxicity Repeated Exposure 1
  Hazards Not Otherwise Classified - Health Hazard - Metal Fume Fever

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- May cause an allergic skin reaction
  Causes serious eye irritation
  May cause allergy or asthma symptoms or breathing difficulties if inhaled
  May cause respiratory irritation
  May cause cancer.
  Suspected of damaging fertility or the unborn child.
  Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention

- Obtain special instructions before use.
  Do not handle until all safety precautions have been read and understood.
  Do not breathe dust.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves, clothing , and eye/face protection , .
  In case of inadequate ventilation wear respiratory protection.

Response

- IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
  If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
  If on skin: Wash with plenty of water .
  Wash contaminated clothing before reuse.
  Specific treatment, see supplemental first aid information.
  If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.

Storage/Disposal

- Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other hazards

OSHA HCS 2012

- Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.
Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to: WHMIS

2.1 Classification of the substance or mixture

WHMIS

- As shipped, these complex alloys in massive form have no known toxicological properties other than causing allergic reactions in individuals sensitive to the metals contained in the alloys. Hazardous fume or dust emissions may be released during remelting, grinding, cutting or welding. The classifications below are related to exposure to the hazardous fume or dust emissions generated remelting, grinding, cutting or welding.
Very Toxic - D1A
Toxic - D1B
Other Toxic Effects - D2A
Other Toxic Effects - D2B

2.2 Label elements

WHMIS

- Very Toxic - D1A
Toxic - D1B
Other Toxic Effects - D2A
Other Toxic Effects - D2B

2.3 Other hazards

WHMIS

- Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.
In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance.

3.2 Mixtures

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Nickel	**CAS:**7440-02-0 **EC Number:**231-111-4	0% TO 99%	NDA	**EU DSD/DPD:** Annex VI, Table 3.2: Carc. Cat. 3; R40; R43; T; R48/23 **EU CLP:** Annex VI, Table 3.1: Carc. 2, H351; STOT RE 1, H372***; Skin Sens. 1, H317 **OSHA HCS 2012:** Carc. 2; Skin Sens. 1A; Resp. Sens. 1B; STOT RE 2 (Lungs)	NDA
Iron	**CAS:**7439-89-6 **EC Number:**231-096-4	0% TO 95%	Ingestion/Oral-Rat LD50 • 750 mg/kg	**EU DSD/DPD:** Xn; R22; R53 **EU CLP:** Acute Tox. 4, H302; Aquatic Chronic 4, H413 **OSHA HCS 2012:** Acute Tox. 4 (orl)	NDA
Copper	**CAS:**7440-50-8 **EC Number:**231-159-6	0% TO 67%	NDA	**EU DSD/DPD:** Xi; R37; Repr. Cat. 3; R63 **EU CLP:** Repr. 2, H361; STOT SE 3: Resp. Irrit., H335 **OSHA HCS 2012:** Repr. 2; STOT SE 3: Resp. Irrit.	NDA
Cobalt	**CAS:**7440-48-4 **EC Number:**231-158-0 **EU Index:**027-001-00-9	0% TO 54%	Ingestion/Oral-Rat LD50 • 6171 mg/kg	**EU DSD/DPD:** Annex VI, Table 3.2: R42/43; R53 **EU CLP:** Annex VI, Table 3.1: Resp. Sens. 1, H334; Skin Sens. 1, H317; Aquatic Chronic 4, H413 **OSHA HCS 2012:** Resp Sens. 1; Skin Sens. 1; Carc. 2;	NDA
Titanium	**CAS:**7440-32-6 **EINECS:**231-142-3	0% TO 52%	NDA	**EU DSD/DPD:** Repr. Cat. 3; R63 **EU CLP:** Repr. 2, H361 **OSHA HCS 2012:** Repr. 2	NDA
Chromium	**CAS:**7440-47-3 **EC Number:**231-157-5	0% TO 49%	NDA	**EU DSD/DPD:** Carc. Cat. 2; R49; R43; N; R50-53 **EU CLP:** Carc. 1B, H350; Skin Sens. 1, H317 **OSHA HCS 2012:** Carc. 1A; Skin Sens. 1	NDA
Molybdenum	**CAS:**7439-98-7 **EC Number:**231-107-2	0% TO 16%	NDA	**EU DSD/DPD:** Xn; R48/20; T; R25 **EU CLP:** STOT RE 2, H373; Acute Tox. 3, H301 **OSHA HCS 2012:** STOT RE 2 (Lungs, Inhl); Acute Tox. 3 (orl)	NDA
Tungsten	**CAS:**7440-33-7 **EC Number:**231-143-9	0% TO 15%	NDA	**EU DSD/DPD:** F; R11; Repr. Cat. 3; R63 **EU CLP:** Flam. Sol. 1, H228; Self-heat. 2, H252; Repr. 2, H361d **OSHA HCS 2012:** Flam. Sol. 1; Self-heat. 2; Repr. 2 (orl); Eye Irrit. 2	NDA
Niobium	**CAS:**7440-03-1 **EC Number:**231-113-5	0% TO 15%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Not Classified **OSHA HCS 2012:** Not Classified	NDA
Aluminum	**CAS:**7429-90-5 **EC Number:**231-072-3	0% TO 13%	NDA	**EU DSD/DPD:** F; R15-17 **EU CLP:** Water-react. 2, H261; Pyr. Sol. 1, H250 **OSHA HCS 2012:** Water-react. 2; Flam. Sol. 1; STOT RE 2 (Lungs, Inhl); Comb. Dust	NDA
Manganese	**CAS:**7439-96-5 **EC Number:**231-105-1	0% TO 4.7%	Ingestion/Oral-Rat LD50 • 9 g/kg	**EU DSD/DPD:** T; R48/23 **EU CLP:** STOT RE 1 (CNS), H372 **OSHA HCS 2012:** Eye Irrit. 2; STOT RE 1 (CNS)	NDA
Silicon	**CAS:**7440-21-3 **EC Number:**231-130-8	0% TO 4%	Ingestion/Oral-Rat LD50 • 3160 mg/kg	**EU DSD/DPD:** F; R11 **EU CLP:** Flam. Sol. 2, H228 **OSHA HCS 2012:** Flam. Sol. 2	NDA
Calcium	**CAS:**7440-70-2 **EC Number:**231-179-5 **EU Index:**020-001-00-X	0% TO 4%	NDA	**EU DSD/DPD:** F; R15 **EU CLP:** Water-react. 2, H261 **OSHA HCS 2012:** Pyr. Sol. 1	NDA
Tantalum	**CAS:**7440-25-7 **EC Number:**231-135-5	0% TO 3%	NDA	**EU DSD/DPD:** Xn; R22 **EU CLP:** Acute Tox. 4, H302 **OSHA HCS 2012:** Acute Tox. 4 (orl)	NDA

Yttrium trioxide	**CAS:**1314-36-9 **EINECS:**215-233-5	0% TO 1%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Not Classified **OSHA HCS 2012:** Not Classified	NDA
Nitrogen	**CAS:**7727-37-9 **EINECS:**231-783-9	0% TO 0.35%	NDA	**EU DSD/DPD:** Not Classified **EU CLP:** Press. Gas - Comp., H280 **OSHA HCS 2012:** Press. Gas - Comp; Simp. Asphyx.	NDA

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. If signs/symptoms continue, get medical attention.

Skin
- In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Wash skin with soap and water. Get medical attention if symptoms occur.

Eye
- Immediately flush eyes for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Ingestion
- Rinse mouth. Do not give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- No specific actions or treatments recommended related to exposure to this material.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media
- No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- Nonflammable, however sparks from welding or grinding in user operations could ignite flammable or combustible liquids, vapors and solids.

Hazardous Combustion Products
- No data available

5.3 Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA).
  Structural firefighters' protective clothing will only provide limited protection.
  Fire fighters should wear complete protective clothing including self-contained breathing apparatus.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Under normal circumstances the materials do not produce any hazardous products and as such do not require any special precautions. Use appropriate Personal Protective Equipment (PPE)

Emergency Procedures

- No emergency procedures are expected to be necessary if material is used under ordinary conditions as recommended.

6.2 Environmental precautions

- No special precautions are necessary.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Vacuum or shovel any spilled material into a suitable container. Alloy wastes are normally collected to recover metal values.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Under normal circumstances the materials do not produce any hazardous products and as such do not require any special precautions. The transient handling of the materials would not be expected to produce any sensitization but it is good practice to use gloves for handling. The normal precautions for handling heavy objects with possible sharp edges should also be observed. If dusts/fumes are created during processing wear appropriate personal protective equipment. Do not breathe dust or fumes. Wash thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Store in a dry place.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	**ACGIH**	**Canada Manitoba**	**Canada Ontario**	**Canada Quebec**	**China**
Chromium (7440-47-3)	STELs	Not established	Not established	Not established	Not established	0.15 mg/m3 STEL
	TWAs	0.5 mg/m3 TWA	Not established	0.5 mg/m3 TWA	0.5 mg/m3 TWAEV	0.05 mg/m3 TWA
	Designated Substances	Not established	Present	Not established	Not established	Not established
Yttrium trioxide	STELs	Not established	Not established	Not established	Not established	2.5 mg/m3 STEL (as Y) *as Yttrium compounds*
	TWAs	1 mg/m3 TWA (as Y) *as Yttrium compounds*	Not established	1 mg/m3 TWA (as Y) *as Yttrium compounds*	1 mg/m3 TWAEV (as Y) *as Yttrium compounds*	1 mg/m3 TWA (as Y) *as Yttrium compounds*
Copper	STELs	Not established	Not established	Not established	Not established	2.5 mg/m3 STEL (dust); 0.6 mg/m3 STEL (fume)

(7440-50-8)	TWAs	0.2 mg/m3 TWA (fume)	Not established	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)	0.2 mg/m3 TWAEV (fume); 1 mg/m3 TWAEV (dust and mist)	1 mg/m3 TWA (dust); 0.2 mg/m3 TWA (fume)
Manganese (7439-96-5)	STELs	Not established	Not established	Not established	Not established	0.45 mg/m3 STEL
	TWAs	0.02 mg/m3 TWA (respirable fraction); 0.1 mg/m3 TWA (inhalable fraction)	Not established	0.2 mg/m3 TWA	0.2 mg/m3 TWAEV (total dust and fume)	0.15 mg/m3 TWA
Tantalum (7440-25-7)	STELs	Not established	Not established	Not established	Not established	12.5 mg/m3 STEL
	TWAs	Not established	Not established	Not established	5 mg/m3 TWAEV (dust)	5 mg/m3 TWA
Cobalt (7440-48-4)	STELs	Not established	Not established	Not established	Not established	0.1 mg/m3 STEL
	TWAs	0.02 mg/m3 TWA	Not established	0.02 mg/m3 TWA	0.02 mg/m3 TWAEV	0.05 mg/m3 TWA
Aluminum (7429-90-5)	STELs	Not established	Not established	Not established	Not established	6 mg/m3 STEL (total dust)
	TWAs	1 mg/m3 TWA (respirable fraction)	Not established	1 mg/m3 TWA (respirable)	10 mg/m3 TWAEV	3 mg/m3 TWA (total dust)
Molybdenum (7439-98-7)	STELs	Not established	Not established	Not established	Not established	15 mg/m3 STEL
	TWAs	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)	Not established	10 mg/m3 TWA (metal, inhalable); 3 mg/m3 TWA (metal, respirable)	Not established	6 mg/m3 TWA
Nickel	STELs	Not established	Not established	Not established	Not established	2.5 mg/m3 STEL
	TWAs	1.5 mg/m3 TWA (inhalable fraction)	Not established	1 mg/m3 TWA (inhalable)	1 mg/m3 TWAEV	1 mg/m3 TWA
	Designated Substances	Not established	Present	Not established	Not established	Not established
Tungsten (7440-33-7)	STELs	10 mg/m3 STEL	Not established	10 mg/m3 STEL	Not established	10 mg/m3 STEL
	TWAs	5 mg/m3 TWA	Not established	5 mg/m3 TWA	Not established	5 mg/m3 TWA
Silicon (7440-21-3)	TWAs	Not established	Not established	10 mg/m3 TWA (total dust)	10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, total dust)	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Europe	Germany DFG	Germany TRGS	NIOSH	OSHA
Chromium (7440-47-3)	TWAs	2 mg/m3 TWA	Not established	2 mg/m3 TWA AGW (inhalable fraction, exposure factor 1)	0.5 mg/m3 TWA	1 mg/m3 TWA
Yttrium trioxide	TWAs	Not established	Not established	Not established	1 mg/m3 TWA (as Y) *as Yttrium compounds*	Not established
Copper (7440-50-8)	TWAs	Not established	Not established	Not established	1 mg/m3 TWA (dust and mist); 0.1 mg/m3 TWA (fume)	0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)
	Ceilings	Not established	0.02 mg/m3 Peak (respirable fraction)	Not established	Not established	Not established
			0.01 mg/m3 TWA MAK (including			

	MAKs	Not established	inorganic copper compounds, respirable fraction)	Not established	Not established	Not established
Manganese (7439-96-5)	Ceilings	Not established	1.6 mg/m3 Peak (Ceiling factor 1 for Permanganates, inhalable fraction); 0.16 mg/m3 Peak (Ceiling factor 1 for Permanganates, respirable fraction)	Not established	Not established	5 mg/m3 Ceiling (fume)
	STELs	Not established	Not established	Not established	3 mg/m3 STEL	Not established
	TWAs	Not established	Not established	0.5 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, inhalable fraction)	1 mg/m3 TWA (fume)	Not established
	MAKs	Not established	0.2 mg/m3 TWA MAK (inhalable fraction); 0.02 mg/m3 TWA MAK (respirable fraction)	Not established	Not established	Not established
Tantalum (7440-25-7)	TWAs	Not established	Not established	Not established	5 mg/m3 TWA (dust)	5 mg/m3 TWA
	STELs	Not established	Not established	Not established	10 mg/m3 STEL (dust)	Not established
	MAKs	Not established	4 mg/m3 TWA MAK (inhalable fraction); 1.5 mg/m3 TWA MAK (respirable fraction)	Not established	Not established	Not established
Cobalt (7440-48-4)	TWAs	Not established	Not established	Not established	0.05 mg/m3 TWA (dust and fume)	0.1 mg/m3 TWA (dust and fume)
Aluminum (7429-90-5)	TWAs	Not established	Not established	Not established	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
	MAKs	Not established	4 mg/m3 TWA MAK (dust, inhalable fraction); 1.5 mg/m3 TWA MAK (dust, respirable fraction)	Not established	Not established	Not established
Nickel (7440-02-0)	TWAs	Not established	Not established	Not established	0.015 mg/m3 TWA	1 mg/m3 TWA
Tungsten (7440-33-7)	STELs	Not established	Not established	Not established	10 mg/m3 STEL	Not established
	TWAs	Not established	Not established	Not established	5 mg/m3 TWA	Not established
Silicon (7440-21-3)	TWAs	Not established	Not established	Not established	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Exposure Control Notations

Canada Ontario

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (Simple asphyxiant)

Canada Quebec

•Cobalt (7440-48-4): **Carcinogens:** (C3 carcinogen - effect detected in animals)

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (Simple asphyxiant)

ACGIH

•Aluminum (7429-90-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

•Aluminum as Aluminum insoluble compounds: **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

•Chromium (7440-47-3): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

•Cobalt (7440-48-4): **Carcinogens:** (A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans)

•Manganese (7439-96-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)

•Nickel (7440-02-0): **Carcinogens:** (A5 - Not Suspected as a Human Carcinogen)

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (Simple asphyxiant (See Appendix F: Minimal Oxygen Content))

Germany TRGS

•Cobalt (7440-48-4): **Carcinogens:** (Category 2 (bioavailable, as inhalable dust/aerosol, except hard metals, cobalt containing spinels and organic cobalt desiccants)) | **Developmental Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (bioavailable, as inhalable dust/aerosol, except hard metals, cobalt containing spinels and organic cobalt desiccants)) | **Reproductive Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (bioavailable, as inhalable dust/aerosol, except hard metals, cobalt containing spinels and organic cobalt desiccants)) | **Germ Cell Mutagens:** (Based on current data, this substance cannot be classified in categories 1-3 (bioavailable, as inhalable dust/aerosol, except hard metals, cobalt containing spinels and organic cobalt desiccants))

Germany DFG

•Aluminum (7429-90-5): **Pregnancy:** (classification not yet possible (respirable, inhalable, dust))

•Cobalt (7440-48-4): **Carcinogens:** (Category 2 (considered to be carcinogenic for man)) | **Sensitizers:** (respiratory and skin sensitizer) | **Skin:** (skin notation)

•Copper (7440-50-8): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

•Manganese (7439-96-5): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to (inhalable fraction, respirable fraction))

•Nickel (7440-02-0): **Carcinogens:** (Category 1 (causes cancer in man)) | **Sensitizers:** (respiratory and skin sensitizer (inhalable fraction, respiratory sensitization confirmed for water soluble Nickel compounds only))

•Nickel as Nickel compounds: **Carcinogens:** (Category 1 (causes cancer in man)) | **Sensitizers:** (respiratory and skin sensitizer (inhalable fraction, respiratory sensitization confirmed for water soluble Nickel compounds only))

•Tantalum (7440-25-7): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to (inhalable fraction); no risk to embryo/fetus if exposure limits adhered to (respirable fraction))

Exposure Limits Supplemental

ACGIH

•Aluminum (7429-90-5): **TLV Basis - Critical Effects:** (pneumoconiosis; lower respiratory tract irritation; neurotoxicity)

•Aluminum as Aluminum insoluble compounds: **TLV Basis - Critical Effects:** (pneumoconiosis; lower respiratory tract irritation; neurotoxicity)

•Chromium (7440-47-3): **TLV Basis - Critical Effects:** (skin and upper respiratory tract irritation)

•Cobalt (7440-48-4): **BEIs:** (15 µg/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (background); 1 µg/L Medium: blood Time: end of shift at end of workweek Parameter: Cobalt (background, semi-quantitative)) | **TLV Basis - Critical Effects:** (asthma; myocardial effects; pulmonary function) | **Notice of Intended Changes (BEIs):** (15 ug/L Medium: urine Time: end of shift at end of workweek Parameter: Cobalt (nonspecific))

•Copper (7440-50-8): **TLV Basis - Critical Effects:** (metal fume fever (fume))

•Copper as Copper compounds: **TLV Basis - Critical Effects:** (gastrointestinal (dust and mist); irritation (dust and mist))

•Manganese (7439-96-5): **TLV Basis - Critical Effects:** (CNS impairment)

•Nickel (7440-02-0): **TLV Basis - Critical Effects:** (dermatitis; pneumoconiosis)

•Tungsten (7440-33-7): **TLV Basis - Critical Effects:** (lower respiratory tract irritation)

•Yttrium trioxide as Yttrium compounds: **TLV Basis - Critical Effects:** (pulmonary fibrosis)

•Nitrogen (7727-37-9): **TLV Basis - Critical Effects:** (asphyxia)

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a

	NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.
Eye/Face	• Wear safety glasses.
Skin/Body	• Wear appropriate gloves. Wear long sleeves and/or protective coveralls.
Environmental Exposure Controls	• Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
BEI = Biological Exposure Indices
MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
STEL = Short Term Exposure Limits are based on 15-minute exposures
TLV = Threshold Limit Value determined by the American Conference of Governmental Industrial Hygienists (ACGIH)
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures
TWAEV = Time-Weighted Average Exposure Value

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Silver colored solid shaped as plate, bar, wire, tube, rod, strip, sheet, or some intermediate form.
Color	Silver	Odor	Data lacking
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point/Freezing Point	> 1260 C(> 2300 F)
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Bulk Density	8 to 9 g/cm³
Water Solubility	Negligible < 0.1 %	Viscosity	Data lacking
Explosive Properties	Data lacking	Oxidizing Properties:	Data lacking
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking	VOC (Wt.)	0 %
VOC (Vol.)	0 %	Volatiles (Wt.)	0 %
Volatiles (Vol.)	0 %		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Data lacking		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Hazardous polymerization not indicated.

10.4 Conditions to avoid

- No data available

10.5 Incompatible materials

- Nickel can react with carbon monoxide to form nickel carbonyl in reducing atmosphere.

10.6 Hazardous decomposition products

- Nickel can react with carbon monoxide to form nickel carbonyl in reducing atmosphere.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Aluminum (0% TO 13%)	7429-90-5	**Reproductive:** Ingestion/Oral-Mouse TDLo • 1260 mg/kg (multigeneration)); *Reproductive Effects:Effects on Newborn*:**Behavioral**; *Reproductive Effects:Effects on Newborn*:**Physical**; *Reproductive Effects:Effects on Newborn*:**Other postnatal measures or effects**
Cobalt (0% TO 54%)	7440-48-4	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 6171 mg/kg; *Behavioral*:**Somnolence (general depressed activity)**; *Behavioral*:**Ataxia**; *Gastrointestinal*:**Hypermotility, diarrhea**; **Multi-dose Toxicity:** Inhalation-Rat TCLo • 2 mg/m³ 4 Day(s)-Intermittent; *Lungs, Thorax, or Respiration*:**Fibrosing alveolitis**
Copper (0% TO 67%)	7440-50-8	**Multi-dose Toxicity:** Ingestion/Oral-Rabbit TDLo • 3 g/kg 60 Day(s)-Continuous; *Cardiac*:**Other changes**; *Liver*:**Hepatitis (hepatocellular necrosis), zonal**; *Related to Chronic Data*:**Death in the Other Multiple Dose data type field**; **Reproductive:** Ingestion/Oral-Rat TDLo • 152 mg/kg (22W pre); *Reproductive Effects:Effects on Embryo or Fetus*:**Fetotoxicity (except death, e.g., stunted fetus)**; *Reproductive Effects:Specific Developmental Abnormalities*:**Central nervous system**; **Tumorigen / Carcinogen:** Ingestion/Oral-Mouse TDLo • 10.08 mg/kg 12 Week(s)-Continuous; *Tumorigenic*:**Carcinogenic by RTECS criteria**; *Lungs, Thorax, or Respiration*:**Other changes**
Iron (0% TO 95%)	7439-89-6	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 750 mg/kg; *Blood*:**Changes in serum composition (e.g., TP, bilirubin cholesterol)**; *Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels*:**Transaminases**; Ingestion/Oral-Child TDLo • 77 mg/kg; *Behavioral*:**Irritability**; *Gastrointestinal*:**Nausea or vomiting**; *Blood*:**Normocytic anemia**; **Multi-dose Toxicity:** Inhalation-Rat TCLo • 150 mg/m³ 4 Hour(s) 78 Week(s)-Intermittent; *Lungs, Thorax, or Respiration*:**Other changes**; *Liver*:**Other changes**; *Nutritional and Gross Metabolic:Gross Metabolite Changes*:**Weight loss or decreased weight gain**
Manganese (0% TO 4.7%)	7439-96-5	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 9 g/kg; **Irritation:** Eye-Rabbit • 500 mg 24 Hour(s) • Mild irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation; **Reproductive:** Ingestion/Oral-Rat TDLo • 90 mg/kg (18D post); *Reproductive Effects:Effects on Newborn*:**Growth statistics (e.g., reduced weight gain)**; *Reproductive Effects:Effects on Newborn*:**Biochemical and metabolic**; *Reproductive Effects:Effects on Newborn*:**Other postnatal measures or effects**
Silicon (0% TO 4%)	7440-21-3	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 3160 mg/kg; **Irritation:** Eye-Rabbit • 3 mg • Mild irritation
Tantalum (0% TO 3%)	7440-25-7	**Acute Toxicity:** Ingestion/Oral-Mouse LD50 • 595 mg/kg

Titanium (0% TO 52%)	7440-32-6	**Reproductive:** Ingestion/Oral-Rat TDLo • 158 mg/kg (multigeneration); *Reproductive Effects:Effects on Embryo or Fetus*:**Fetotoxicity (except death, e.g., stunted fetus)**; *Reproductive Effects:Effects on Embryo or Fetus*:**Fetal death**
Tungsten (0% TO 15%)	7440-33-7	**Irritation:** Eye-Rabbit • 500 mg 24 Hour(s) • Mild irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation; **Reproductive:** Ingestion/Oral-Rat TDLo • 1210 µg/kg (35W pre); *Reproductive Effects:Effects on Fertility*:**Post-implantation mortality**; *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**

GHS Properties	Classification
Respiratory sensitization	**EU/CLP** • Respiratory Sensitizer 1 **OSHA HCS 2012** • Respiratory Sensitizer 1
Serious eye damage/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Eye Irritation 2
Acute toxicity	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Aspiration Hazard	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Carcinogenicity	**EU/CLP** • Carcinogenicity 1B **OSHA HCS 2012** • Carcinogenicity 1A
Germ Cell Mutagenicity	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Skin corrosion/Irritation	**EU/CLP** • Data lacking **OSHA HCS 2012** • Data lacking
Skin sensitization	**EU/CLP** • Skin Sensitizer 1 **OSHA HCS 2012** • Skin Sensitizer 1A
STOT-RE	**EU/CLP** • Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2 **OSHA HCS 2012** • Specific Target Organ Toxicity Repeated Exposure 1
STOT-SE	**EU/CLP** • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation **OSHA HCS 2012** • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
Toxicity for Reproduction	**EU/CLP** • Toxic to Reproduction 2 **OSHA HCS 2012** • Toxic to Reproduction 2

Potential Health Effects

Inhalation

Acute (Immediate)

- May cause respiratory irritation. Processes such as cutting, grinding, crushing, or impact may result in generation of excessive amounts of airborne dusts in the workplace. Nuisance dust may affect the lungs but reactions are typically reversible.

Chronic (Delayed)

- Repeated and prolonged exposure to dust may cause lung effects including pneumoconiosis. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Prolonged exposure to manganese fumes and dusts has resulted in a progressive deterioration of the Central Nervous System. Symptoms resemble late Parkinsons disease and include weakness in the legs, increased muscle tone, hand tremor, slurred speech, muscle cramps, spastic gate, fixed facial expression and mental deterioration.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation. May cause skin sensitization. Symptoms include redness, and skin rash.

Chronic (Delayed)

- No data available.

Eye

Acute (Immediate)
- Exposure to dust may cause mechanical irritation. Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes.

Chronic (Delayed)
- No data available.

Ingestion

Acute (Immediate)
- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)
- No data available.

Carcinogenic Effects
- Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Cobalt	7440-48-4	Group 2B-Possible Carcinogen	Not Listed
Nickel	7440-02-0	Group 2B-Possible Carcinogen	Reasonably Anticipated to be Human Carcinogen

Reproductive Effects
- Repeated and prolonged exposure may cause reproductive effects.

11.2 Other information

- Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

Key to abbreviations

LD = Lethal Dose

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- These alloys are not soluble in water and react only very slowly with natural environments.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IMO/IMDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

14.6 Special precautions for user

- None specified.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Data lacking.

Section 15 - Regulatory Information

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

SARA Hazard Classifications

- Acute, Chronic

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Aluminum	7429-90-5	Yes	Yes	Yes
Calcium	7440-70-2	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes
Iron	7439-89-6	No	No	No
Manganese	7439-96-5	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes
Niobium	7440-03-1	No	No	No
Nitrogen	7727-37-9	Yes	Yes	Yes
Silicon	7440-21-3	Yes	Yes	Yes
Tantalum	7440-25-7	Yes	Yes	Yes
Titanium	7440-32-6	No	Yes	No
Tungsten	7440-33-7	Yes	Yes	Yes
Yttrium trioxide	1314-36-9	No	No	No

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**EU EINECS**	**EU ELNICS**	**TSCA**
Aluminum	7429-90-5	Yes	No	Yes	No	Yes

Calcium	7440-70-2	Yes	No	Yes	No	Yes
Chromium	7440-47-3	Yes	No	Yes	No	Yes
Cobalt	7440-48-4	Yes	No	Yes	No	Yes
Copper	7440-50-8	Yes	No	Yes	No	Yes
Iron	7439-89-6	Yes	No	Yes	No	Yes
Manganese	7439-96-5	Yes	No	Yes	No	Yes
Molybdenum	7439-98-7	Yes	No	Yes	No	Yes
Nickel	7440-02-0	Yes	No	Yes	No	Yes
Niobium	7440-03-1	Yes	No	Yes	No	Yes
Nitrogen	7727-37-9	Yes	No	Yes	No	Yes
Silicon	7440-21-3	Yes	No	Yes	No	Yes
Tantalum	7440-25-7	Yes	No	Yes	No	Yes
Titanium	7440-32-6	Yes	No	Yes	No	Yes
Tungsten	7440-33-7	Yes	No	Yes	No	Yes
Yttrium trioxide	1314-36-9	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	B6, E
• Copper	7440-50-8	Uncontrolled product according to WHMIS classification criteria
• Chromium	7440-47-3	Uncontrolled product according to WHMIS classification criteria
• Manganese	7439-96-5	D2A (including powder)
• Tantalum	7440-25-7	Uncontrolled product according to WHMIS classification criteria
• Cobalt	7440-48-4	D2A, D2B
• Aluminum	7429-90-5	B6 (powder); Uncontrolled product according to WHMIS classification criteria
• Molybdenum	7439-98-7	Uncontrolled product according to WHMIS classification criteria
• Nickel	7440-02-0	D2A, D2B; B6, D2A (Raney)
• Silicon	7440-21-3	B4
• Tungsten	7440-33-7	Uncontrolled product according to WHMIS classification criteria
• Iron	7439-89-6	Uncontrolled product according to WHMIS classification criteria
• Nitrogen	7727-37-9	A
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

Canada - WHMIS - Ingredient Disclosure List

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	1 %
• Chromium	7440-47-3	0.1 %
• Manganese	7439-96-5	1 %
• Tantalum	7440-25-7	1 %
• Cobalt	7440-48-4	0.1 %
• Aluminum	7429-90-5	1 %
• Molybdenum	7439-98-7	1 %
• Nickel	7440-02-0	0.1 %
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	1 %
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	F; R15
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	R42/43 R53
• Aluminum	7429-90-5	F; R11-15
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Carc.Cat.3; R40 R43 T; R48/23
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed

• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	F R:15 S:(2)-8-24/25-43
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Xn R:42/43-53 S:(2)-22-24-37-61
• Aluminum	7429-90-5	F R:11-15 S:(2)-7/8-43
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	T R:40-43-48/23 S:(2)-36/37/39-45
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	T
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	S, 7
• Silicon	7440-21-3	Not Listed

• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	S:(2)-8-24/25-43
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	S:(2)-22-24-37-61
• Aluminum	7429-90-5	S:(2)-7/8-43
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	S:(2)-36/37/39-45
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed

• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)
• Chromium	7440-47-3	5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed

• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	1.0 % de minimis concentration
• Chromium	7440-47-3	1.0 % de minimis concentration
• Manganese	7439-96-5	1.0 % de minimis concentration
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	0.1 % de minimis concentration
• Aluminum	7429-90-5	1.0 % de minimis concentration (dust or fume only)
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	0.1 % de minimis concentration
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed

• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Included in waste streams: F032, F034, F035, F037, F038, F039
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Included in waste streams: F006, F039
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Constituents for Detection Monitoring

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	(total)
• Chromium	7440-47-3	(total)
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	(total)
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	(total)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - D Series Wastes - Max Conc of Contaminants for the Tox Characteristic

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	5.0 mg/L regulatory level
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed

• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	hazardous constituent - no waste number
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	hazardous constituent - no waste number
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - List for Hazardous Constituents

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	(total)
• Chromium	7440-47-3	(total)
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	(total)
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	(total)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	2.77 mg/L (total, wastewater); 0.60 mg/L TCLP (total,

		nonwastewater)
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	3.98 mg/L (wastewater); 11.0 mg/L TCLP (nonwastewater)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - TSD Facilities Ground Water Monitoring

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	(total)
• Chromium	7440-47-3	(total)
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	(total)
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	(total)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	carcinogen, 7/1/1992 (powder)
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	carcinogen, 10/1/1989 (metallic)
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	(dust; fume; metal)
• Chromium	7440-47-3	
• Manganese	7439-96-5	
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	
• Aluminum	7429-90-5	
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed

• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances		
• Yttrium trioxide	1314-36-9	Not Listed
• Calcium	7440-70-2	Not Listed
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	
• Manganese	7439-96-5	Not Listed
• Tantalum	7440-25-7	Not Listed
• Cobalt	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Molybdenum	7439-98-7	Not Listed
• Nickel	7440-02-0	
• Silicon	7440-21-3	Not Listed
• Tungsten	7440-33-7	Not Listed
• Iron	7439-89-6	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Titanium	7440-32-6	Not Listed
• Niobium	7440-03-1	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

- WARNING: This product contains a chemical known to the State of California to cause cancer.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H228 - Flammable solid
  H250 - Catches fire spontaneously if exposed to air
  H252 - Self-heating in large quantities; may catch fire
  H261 - In contact with water releases flammable gas
  H280 - Contains gas under pressure; may explode if heated
  H301 - Toxic if swallowed
  H302 - Harmful if swallowed
  H351 - Suspected of causing cancer.
  H361 - Suspected of damaging fertility or the unborn child.
  H413 - May cause long lasting harmful effects to aquatic life

  R11 - Highly flammable.
  R15 - Contact with water liberates extremely flammable gases.
  R17 - Spontaneously flammable in air.
  R25 - Toxic if swallowed.
  R40 - Limited evidence of a carcinogenic effect.
  R43 - May cause sensitisation by skin contact.
  R48/20 - Harmful: danger of serious damage to health by prolonged exposure through inhalation.
  R50 - Very toxic to aquatic organisms.
  R53 - May cause long-term adverse effects in the aquatic environment.

Revision Date
- 17/December/2015

Preparation Date
- 16/September/2011

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- The information in this SDS was obtained from sources which we believe are reliable.

Liability

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Key to abbreviations

NDA = No data available