

Safety Data Sheet



DONCASTERS

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

1.1 Product identifier

Product Name

- Monel Based Alloys

Synonyms

- (X) Monel; CuNi; Monel (X)

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

Relevant identified use(s)

- Cast ingots at varying weights and dimensions. Ingots are sold and distributed to downstream processors who remelt the superalloys into products used within various downstream applications.

1.3 Details of the supplier of the safety data sheet

Manufacturer

- Doncasters US Holdings, Inc.
3245 Cherry Avenue
Long Beach, CA 90807
United States

Telephone (General) • 860-677-1376

Telephone (Technical) • 562-595-6625

1.4 Emergency telephone number

Manufacturer

- 800-262-8200 - CHEMTREC

Manufacturer

- +1-703-741-5500 - CHEMTREC

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 2015/830]

2.1 Classification of the substance or mixture

CLP

- Skin Sensitization 1 - H317
- Respiratory Sensitization 1 - H334
- Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
- Carcinogenicity 2 - H351
- Reproductive Toxicity 1B - H360D
- Specific Target Organ Toxicity Single Exposure 1 - H370
- Specific Target Organ Toxicity Repeated Exposure 1 - H372
- Specific Target Organ Toxicity Repeated Exposure 2 - H373

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
 H351 - Suspected of causing cancer.
 H360D - May damage the unborn child.
 H370 - Causes damage to organs.
 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 or fume.
 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.
 P272 - Contaminated work clothing should not be allowed out of the workplace.
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.
 P284 - In case of inadequate ventilation wear respiratory protection.
- Response** • P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P312 - Call a POISON CENTER/doctor if you feel unwell.
 P302+P352 - IF ON SKIN: Wash with plenty of water.
 P321 - Specific treatment, see supplemental first aid information.
 P362+P364 - Take off contaminated clothing and wash it before reuse.
 P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
 P308+P311 - IF exposed or concerned: Call a POISON CENTER or doctor/physician.
 P308+P313 - IF exposed or concerned: Get medical advice/attention.
 P314 - Get medical advice/attention if you feel unwell.
- 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.

2.3 Other Hazards

- CLP**
- May form combustible dust concentrations in air.
 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.

UN GHS Revision 3

According to: UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS): Third Revised Edition

2.1 Classification of the substance or mixture

- UN GHS**
- Skin Sensitization 1
 Respiratory Sensitization 1
 Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
 Carcinogenicity 2
 Reproductive Toxicity 1B
 Specific Target Organ Toxicity Single Exposure 1
 Specific Target Organ Toxicity Repeated Exposure 1
 Specific Target Organ Toxicity Repeated Exposure 2

2.2 Label elements

UN GHS

DANGER

- Hazard statements**
- May cause an allergic skin reaction
 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
 - May cause respiratory irritation
 - Suspected of causing cancer.
 - May damage fertility or the unborn child.
 - Causes damage to organs.
 - Causes damage to organs through prolonged or repeated exposure.
 - May cause 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 or fume.
 - Wash thoroughly after handling.
 - Do not eat, drink or smoke when using this product.
 - Use only outdoors or in a well-ventilated area.
 - Contaminated work clothing should not be allowed out of the workplace.
 - Wear protective gloves/protective clothing/eye protection/face protection.
 - Use personal protective equipment as required.
 - In case of inadequate ventilation wear respiratory protection.
- Response**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 - Call a POISON CENTER or doctor/physician.
 - IF ON SKIN: Wash with plenty of soap and water.
 - Specific treatment, see supplemental first aid information.
 - Wash contaminated clothing before reuse.
 - If skin irritation or rash occurs: Get medical advice/attention.
 - IF exposed: Call POISON CENTER or doctor/physician.
 - IF exposed or concerned: Get medical advice/attention.
 - Get medical advice/attention if you feel unwell.

- 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**UN GHS**

- May form combustible dust concentrations in air.
- 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 the Globally Harmonized System for Classification and Labeling (GHS) this product is considered hazardous

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture**OSHA HCS 2012**

- Skin Sensitization 1
- Respiratory Sensitization 1
- Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
- Carcinogenicity 2
- Reproductive Toxicity 1B
- Specific Target Organ Toxicity Single Exposure 1
- Specific Target Organ Toxicity Repeated Exposure 1
- Specific Target Organ Toxicity Repeated Exposure 2
- Combustible Dust

Hazards Not Otherwise Classified - Health Hazards - Metal fume fever

2.2 Label elements

OSHA HCS 2012

DANGER



- Hazard statements**
- May cause an allergic skin reaction
 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
 - May cause respiratory irritation
 - Suspected of causing cancer.
 - May damage fertility or the unborn child.
 - Causes damage to organs.
 - Causes damage to organs through prolonged or repeated exposure.
 - May cause damage to organs through prolonged or repeated exposure.
 - May form combustible dust concentrations in air.

Precautionary statements

- Prevention**
- Obtain special instructions before use.
 - Do not handle until all safety precautions have been read and understood.
 - Do not breathe dust or fume.
 - Wash thoroughly after handling.
 - Do not eat, drink or smoke when using this product.
 - Use only outdoors or in a well-ventilated area.
 - Contaminated work clothing should not be allowed out of the workplace.
 - Wear protective gloves/protective clothing/eye protection/face protection.
 - In case of inadequate ventilation wear respiratory protection.
- Response**
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 - Call a POISON CENTER/doctor.
 - If on skin: Wash with plenty of water.
 - Specific treatment, see supplemental first aid information.
 - Wash contaminated clothing before reuse.
 - If skin irritation or rash occurs: Get medical advice/attention.
 - IF exposed: Call POISON CENTER or doctor/physician.
 - IF exposed or concerned: Get medical advice/attention.
 - Get medical advice/attention if you feel unwell.
- 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 2015

2.1 Classification of the substance or mixture

WHMIS 2015

- Skin Sensitization 1
- Respiratory Sensitization 1
- Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
- Carcinogenicity 2
- Reproductive Toxicity 1B
- Specific Target Organ Toxicity Single Exposure 1
- Specific Target Organ Toxicity Repeated Exposure 1

Specific Target Organ Toxicity Repeated Exposure 2
 Combustible Dusts 1
 Health Hazards Not Otherwise Classified 1

2.2 Label elements

WHMIS 2015

DANGER



- Hazard statements**
- May cause an allergic skin reaction
 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
 - May cause respiratory irritation
 - Suspected of causing cancer.
 - May damage fertility or the unborn child.
 - Causes damage to organs.
 - Causes damage to organs through prolonged or repeated exposure.
 - May cause damage to organs through prolonged or repeated exposure.
 - May form combustible dust concentrations in air.
 - 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.

Precautionary statements

- Prevention**
- Obtain special instructions before use.
 - Do not handle until all safety precautions have been read and understood.
 - Do not breathe dust or fume.
 - Wash thoroughly after handling.
 - Do not eat, drink or smoke when using this product.
 - Use only outdoors or in a well-ventilated area.
 - Contaminated work clothing should not be allowed out of the workplace.
 - Wear protective gloves/protective clothing/eye protection/face protection.
 - In case of inadequate ventilation wear respiratory protection.
- Response**
- IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
 - IF ON SKIN: Wash with plenty of water.
 - Take off contaminated clothing and wash it before reuse.
 - Specific treatment, see supplemental first aid information.
 - If skin irritation or rash occurs: Get medical advice/attention.
 - IF exposed or concerned: Call a POISON CENTER/doctor.
 - IF exposed or concerned: Get medical advice/attention.
 - Get medical advice/attention if you feel unwell.
- 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

WHMIS 2015

- 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	25% TO 70%	NDA	EU CLP: Annex VI, Table 3.1: Skin Sens. 1, H317; Carc. 2, H351 (Inhl); STOT RE 1, H372 (Lungs / OrI/Dermal/Inhl); Aquatic Chronic 3, H412 UN GHS Revision 3: Flam. Sol. 1; Resp. Sens. 1B; Skin Sens. 1A; Carc. 2 (Inhl); STOT RE 2 (Lungs / OrI, Inhl); Aquatic Acute 3; Aquatic Chronic 3 OSHA HCS 2012: Flam. Sol. 1; Comb. Dust; Resp. Sens. 1B; Skin Sens. 1A; Carc. 2 (Inhl); STOT RE 2 (Lungs / OrI, Inhl) WHMIS 2015: Flam. Sol. 1; Comb. Dust; Resp. Sens. 1B; Skin Sens. 1A; Carc. 2 (Inhl); STOT RE 2 (Lungs / OrI, Inhl)	NDA
Copper	CAS:7440-50-8 EC Number:231-159-6	20% TO 70%	NDA	EU CLP: Repr. 1B, H360D (OrI); STOT SE 1, H370 (Kidney, OrI); STOT SE 3: Resp. Irrit., H335; STOT RE 2, H373 (Liver, OrI); Aquatic Acute 1, H400 (M=100); Aquatic Chronic 1, H410 (M=10) UN GHS Revision 3: Repr. 1B (OrI); STOT SE 1 (Kidney, OrI); STOT SE 3: Resp. Irrit.; STOT RE 2 (Liver, OrI); Aquatic Acute 1 (M=100); Aquatic Chronic 1 (M=10) OSHA HCS 2012: Comb. Dust; Repr. 1B (OrI); STOT SE 1 (Kidney, OrI); STOT SE 3: Resp. Irrit.; STOT RE 2 (Liver, OrI); Hazard Not Otherwise Classified - Health Hazard - Metal Fume Fever WHMIS 2015: Comb. Dust; Repr. 1B (OrI); STOT SE 1 (Kidney, OrI); STOT SE 3: Resp. Irrit.; STOT RE 2 (Liver, OrI); Hazard Not Otherwise Classified - Health Hazard - Metal Fume Fever	NDA
Silicon	CAS:7440-21-3 EC Number:231-130-8	0% TO 8%	Ingestion/Oral-Rat LD50 • 3160 mg/kg	EU CLP: Flam. Sol. 2, H228 UN GHS Revision 3: Flam. Sol. 2; Acute Tox. 5 (OrI) OSHA HCS 2012: Flam. Sol. 2 WHMIS 2015: Flam. Sol. 2	NDA
Iron	CAS:7439-89-6 EC Number:231-096-4	0% TO 5%	NDA	EU CLP: Acute Tox. 4, H302; Aquatic Chronic 4, H413 UN GHS Revision 3: Acute Tox. 4 (OrI); Aquatic Chronic 4 OSHA HCS 2012: Acute Tox. 4 (OrI) WHMIS 2015: Acute Tox. 4 (OrI)	NDA
Aluminum	CAS:7429-90-5 EC Number:231-072-3	0% TO 5%	NDA	EU CLP: Annex VI, Table 3.1: Flam. Sol. 1, H228; Water-react. 2, H261 UN GHS Revision 3: Flam. Sol. 1; Water-react. 2; STOT RE 1 (Lungs / Inhl) OSHA HCS 2012: Flam. Sol. 1; Water-react. 2; Comb. Dust; STOT RE 1 (Lungs / Inhl) WHMIS 2015: Flam. Sol. 1; Water-react. 2; Comb. Dust; STOT RE 1 (Lungs / Inhl)	NDA
Manganese	CAS:7439-96-5 EC Number:231-105-1	0% TO 2%	Ingestion/Oral-Rat LD50 • 9 g/kg	EU CLP: Flam. Sol. 2, H228; Eye Irrit. 2, H319; Repr. 2, H361 (OrI); STOT RE 1 (CNS, Lungs / Inhl) UN GHS Revision 3: Flam. Sol. 2; Skin Irrit. 3; Eye Irrit. 2; Repr. 2 (OrI); STOT RE 1 (CNS, Lungs/ Inhl) OSHA HCS 2012: Flam. Sol. 2; Comb. Dust; Eye Irrit. 2; Repr. 2 (OrI); STOT RE 1 (CNS, Lungs / Inhl); Hazard Not Otherwise Classified - Health Hazard - Metal fume fever WHMIS 2015: Flam. Sol. 2; Comb. Dust; Eye Irrit. 2; Repr. 2 (OrI); STOT RE 1 (CNS, Lungs / Inhl); Hazard Not Otherwise Classified - Health Hazard - Metal fume fever	NDA
				EU CLP: Annex VI, Table 3.1: Resp. Sens. 1, H334; Skin	

Cobalt (powder)	CAS:7440-48-4 EC Number:231-158-0 EU Index:027-001-00-9	0% TO 2%	Ingestion/Oral-Rat LD50 • 6171 mg/kg	Sens. 1, H317; Aquatic Chronic 1, H410 (M=1) UN GHS Revision 3: Eye Irrit. 2; Resp. Sens. 1; Skin Sens. 1; Carc. 2 (Inhl); STOT RE 2 (Lung / Inhl); Aquatic Acute 2; Aquatic Chronic 2 OSHA HCS 2012: Eye Irrit. 2; Resp. Sens. 1; Skin Sens. 1; Carc. 2 (Inhl); STOT RE 2 (Lung / Inhl) WHMIS 2015: Eye Irrit. 2; Resp. Sens. 1; Skin Sens. 1; Carc. 2 (Inhl); STOT RE 2 (Lung / Inhl)	NDA
Chromium	CAS:7440-47-3 EC Number:231-157-5	0% TO 0.5%	NDA	EU CLP: Not Classified UN GHS Revision 3: Not Classified OSHA HCS 2012: Comb. Dust WHMIS 2015: Comb. Dust	NDA

See Section 16 for full text of H-statements.

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

- Wash skin with soap and water. If skin irritation occurs: Get medical advice/attention.

Eye

- In case of contact with substance, immediately flush eyes with running water for at least 20 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

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media • Use dry powder extinguishing agent.

Unsuitable Extinguishing Media • No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards

- Metal powder dispersed in air may cause fire and explosion. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Molten metal can ignite combustibles. Molten metal will react violently with water.

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.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. Keep unauthorized personnel away.

6.2 Environmental precautions

- Avoid run off to waterways and sewers.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Avoid generating dust.
Solid ingot material should be picked up and recycled.
Where possible allow molten material to solidify naturally.
Residue from cutting or grinding should be swept or vacuumed and placed in suitable containers.
Use clean nonsparking tools to collect material.
Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

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 conditions, exposure to cast ingots presents few health hazards in itself. Thermal cutting and melting of ingots may produce fumes and dust containing the component elements which may present potentially significant health hazards. Nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, an extremely toxic gas. Use only with adequate ventilation. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Cobalt causes a dermatitis of the allergic sensitivity type at points in friction. Cobalt toxicity also results in a progressive diffuse, interstitial pneumonia with a non-productive cough, dyspnea on exertion, interstitial fibrosis and cell damage. Other workers have experienced a sensitized respiratory disease characterized by cough, wheezing and shortness of breath where upon removal from the environment, the symptoms subside. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe dust or fumes. Avoid contact with skin, eyes, and clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Keep away from incompatible materials.

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	Europe	NIOSH	OSHA	United Kingdom
Chromium (7440-47-3)	TWAs	0.5 mg/m ³ TWA	2 mg/m ³ TWA	0.5 mg/m ³ TWA	1 mg/m ³ TWA	0.5 mg/m ³ TWA
	STELs	Not established	Not established	Not established	Not established	1.5 mg/m ³ STEL (calculated)
Manganese	STELs	Not established	Not established	3 mg/m ³ STEL	Not established	1.5 mg/m ³ STEL (calculated)
	TWAs	0.02 mg/m ³ TWA (respirable fraction); 0.1 mg/m ³ TWA (inhalable fraction)	Not established	1 mg/m ³ TWA (fume)	Not established	0.5 mg/m ³ TWA (as Mn)
	Ceilings	Not established	Not established	Not established	5 mg/m ³ Ceiling (fume)	Not established
Cobalt (powder) (7440-48-4)	STELs	Not established	Not established	Not established	Not established	0.3 mg/m ³ STEL (calculated)
	TWAs	0.02 mg/m ³ TWA	Not established	0.05 mg/m ³ TWA (dust and fume)	0.1 mg/m ³ TWA (dust and fume)	0.1 mg/m ³ TWA
Aluminum (7429-90-5)	STELs	Not established	Not established	Not established	Not established	30 mg/m ³ STEL (calculated, inhalable dust); 12 mg/m ³ STEL (calculated, respirable dust)
	TWAs	1 mg/m ³ TWA (respirable fraction)	Not established	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)	10 mg/m ³ TWA (inhalable dust); 4 mg/m ³ TWA (respirable dust)
Silicon (7440-21-3)	STELs	Not established	Not established	Not established	Not established	30 ppm STEL (calculated, inhalable dust); 12 mg/m ³ STEL (calculated, respirable dust)
	TWAs	Not established	Not established	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)	10 mg/m ³ TWA (inhalable dust); 4 mg/m ³ TWA (respirable dust)
Copper (7440-50-8)	STELs	Not established	Not established	Not established	Not established	0.6 mg/m ³ STEL (calculated, fume); 2 mg/m ³ STEL (dust and mist)
	TWAs	0.2 mg/m ³ TWA (fume)	Not established	1 mg/m ³ TWA (dust and mist); 0.1 mg/m ³ TWA (fume)	0.1 mg/m ³ TWA (fume); 1 mg/m ³ TWA (dust and mist)	1 mg/m ³ TWA (dust and mists); 0.2 mg/m ³ TWA (fume)
Nickel (7440-02-0)	STELs	Not established	Not established	Not established	Not established	1.5 mg/m ³ STEL (calculated)
	TWAs	1.5 mg/m ³ TWA (inhalable fraction)	Not established	0.015 mg/m ³ TWA	1 mg/m ³ TWA	0.5 mg/m ³ TWA

8.2 Exposure controls

Engineering

- Use a local exhaust when cutting, grinding, welding, or melting. It is recommended

Measures/Controls

that dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is not leakage from the equipment). Use only appropriately classified electrical equipment.

Personal Protective Equipment**Respiratory**

- For limited exposure, use P95 or N95 respirator. 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 goggles.

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

STEL = Short Term Exposure Limits are based on 15-minute exposures

NIOSH = National Institute of Occupational Safety and Health

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

OSHA = Occupational Safety and Health Administration

Section 9 - Physical and Chemical Properties**9.1 Information on Basic Physical and Chemical Properties**

Material Description			
Physical Form	Solid	Appearance/Description	A metallic gray metal ingot with no odor.
Color	Metallic gray.	Odor	Odorless
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point/Freezing Point	2700 °F(1482.2222 °C)
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	= 8 Water=1	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	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 will not occur.

10.4 Conditions to avoid

- Avoid generating dust.

10.5 Incompatible materials

- Cast Ingot is stable at ordinary temperature, however, caution should be taken with acids, bases, and oxidizers. Molten metal will react violently with water.

10.6 Hazardous decomposition products

- Under normal conditions, exposure to cast ingots presents few health hazards in itself. Thermal cutting and melting of ingots may produce fumes containing the component elements and breathing those fumes may present potentially significant health hazards.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

		Components
Nickel (25% TO 70%)	7440-02-0	<p>Acute Toxicity: Ingestion/Oral-Rat TDLo • 200 mg/kg; <i>Nutritional and Gross Metabolic:</i>Gross Metabolite Changes:Weight loss or decreased weight gain; <i>Behavioral:</i>Somnolence (general depressed activity);</p> <p>Multi-dose Toxicity: Ingestion/Oral-Rat TDLo • 500 mg/kg 5 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i>Fibrosis, focal (pneumoconiosis); <i>Related to Chronic Data:</i>Death in the Other Multiple Dose data type field; Inhalation-Rabbit TCLo • 1 mg/m³ 6 Hour(s) 13 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i>Other changes; <i>Lungs, Thorax, or Respiration:</i>Changes in lung weight; <i>Blood:</i>Hemorrhage; Inhalation-Rat TCLo • 0.4 mg/m³ 40 Week(s)-Intermittent; <i>Vascular:</i>Thrombosis distant from injection site; <i>Lungs, Thorax, or Respiration:</i>Other changes; <i>Related to Chronic Data:</i>Death in the Other Multiple Dose data type field;</p> <p>Reproductive: Ingestion/Oral-Rat TDLo • 158 mg/kg (multigenerations); <i>Reproductive Effects:</i>Effects on Embryo or Fetus:Fetotoxicity (except death, e.g., stunted fetus); <i>Reproductive Effects:</i>Effects on Embryo or Fetus:Fetal death;</p> <p>Tumorigen / Carcinogen: Inhalation-Guinea Pig TCLo • 15 mg/m³ 91 Week(s)-Intermittent; <i>Tumorigenic:</i>Equivocal tumorigenic agent by RTECS criteria; <i>Lungs, Thorax, or Respiration:</i>Tumors; <i>Lungs, Thorax, or Respiration:</i>Bronchiogenic carcinoma</p>
Manganese (0% TO 2%)	7439-96-5	<p>Acute Toxicity: Ingestion/Oral-Rat LD50 • 9 g/kg; Inhalation-Man TCLo • 2300 µg/m³; <i>Brain and Coverings:</i>Other degenerative changes; <i>Behavioral:</i>Changes in motor activity (specific assay); <i>Behavioral:</i>Muscle weakness;</p> <p>Irritation: Eye-Rabbit • 500 mg 24 Hour(s) • Mild irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation;</p> <p>Multi-dose Toxicity: Inhalation-Rat TCLo • 0.7 mg/m³ 24 Hour(s) 22 Week(s)-Continuous; <i>Lungs, Thorax, or Respiration:</i>Fibrosis (interstitial); <i>Immunological Including Allergic:</i>Decrease in cellular immune response; Inhalation-Rat TCLo • 0.3 mg/m³ 5 Hour(s) 26 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i>Fibrosis (interstitial); <i>Immunological Including Allergic:</i>Decrease in cellular immune response;</p> <p>Reproductive: Ingestion/Oral-Mouse TDLo • 322.5 mg/kg (43D male); <i>Reproductive Effects:</i>Paternal Effects:Spermatogenesis; Ingestion/Oral-Rat TDLo • 50 mg/kg (20D post); <i>Reproductive Effects:</i>Specific Developmental Abnormalities:Central nervous system; <i>Reproductive Effects:</i>Effects on Newborn:Biochemical and metabolic; <i>Reproductive Effects:</i>Effects on Newborn:Behavioral; Ingestion/Oral-Rat TDLo • 90 mg/kg (18D post); <i>Reproductive Effects:</i>Effects on Newborn:Growth statistics (e.g., reduced weight gain); <i>Reproductive Effects:</i>Effects on Newborn:Biochemical and metabolic; <i>Reproductive Effects:</i>Effects on Newborn:Other postnatal measures or effects</p>
		<p>Multi-dose Toxicity: Inhalation-Man TCLo • 4 mg/m³ 1 Year(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i>Cough; <i>Lungs,</i></p>

Aluminum (0% TO 5%)	7429 -90- 5	<i>Thorax, or Respiration:</i> Dyspnea ; <i>Nutritional and Gross Metabolic:</i> Gross Metabolite Changes:Weight loss or decreased weight gain ; Inhalation-Rat TCl ₀ • 206 mg/m ³ 5 Hour(s) 30 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosis (interstitial) ; <i>Endocrine:</i> Hypoglycemia ; <i>Blood:</i> Changes in serum composition (e.g., TP, bilirubin cholesterol)
Silicon (0% TO 8%)	7440 -21- 3	Acute Toxicity: Ingestion/Oral-Rat LD50 • 3160 mg/kg; Irritation: Eye-Rabbit • 3 mg • Mild irritation
Cobalt (powder) (0% TO 2%)	7440 -48- 4	Acute Toxicity: Ingestion/Oral-Rat LD50 • 6171 mg/kg; <i>Behavioral:</i> Somnolence (general depressed activity) ; <i>Behavioral:</i> Ataxia ; <i>Gastrointestinal:</i> Hypermotility, diarrhea ; Multi-dose Toxicity: Inhalation-Rabbit TCl ₀ • 10 mg/m ³ 2 Hour(s) 56 Day(s)-Intermittent; <i>Behavioral:</i> Food intake (animal) ; <i>Lungs, Thorax, or Respiration:</i> Emphysema ; <i>Liver:</i> Fatty liver degeneration ; Inhalation-Rat TCl ₀ • 0.09 mg/m ³ 24 Hour(s) 4 Week(s)-Continuous; <i>Peripheral Nerve and Sensation:</i> Recording from afferent nerve ; Inhalation-Rat TCl ₀ • 2 mg/m ³ 4 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosing alveolitis
Copper (20% TO 70%)	7440 -50- 8	Acute Toxicity: Ingestion/Oral-Mouse TDLo • 108 mg/kg; <i>Behavioral:</i> Tremor ; <i>Gastrointestinal:</i> Hypermotility, diarrhea ; <i>Gastrointestinal:</i> Nausea or vomiting ; Ingestion/Oral-Mouse TDLo • 158 mg/kg; <i>Kidney, Ureter, and Bladder:</i> Changes in tubules (including acute renal failure, acute tubular necrosis) ; Ingestion/Oral-Mouse TDLo • 232 mg/kg; <i>Kidney, Ureter, and Bladder:</i> Changes primarily in glomeruli ; <i>Blood:</i> Changes in spleen ; <i>Blood:</i> Changes in serum composition (e.g., TP, bilirubin cholesterol) ; Multi-dose Toxicity: Ingestion/Oral-Rabbit TDLo • 3 g/kg 60 Day(s)-Continuous; <i>Cardiac:</i> Other changes ; <i>Liver:</i> Hepatitis (hepatocellular necrosis), zonal ; <i>Related to Chronic Data:</i> Death in the Other Multiple Dose data type field ; Reproductive: Ingestion/Oral-Rat TDLo • 1520 µg/kg (22W pre); <i>Reproductive Effects:</i> Specific Developmental Abnormalities:Musculoskeletal system ; Ingestion/Oral-Rat TDLo • 152 mg/kg (22W pre); <i>Reproductive Effects:</i> Effects on Embryo or Fetus:Fetotoxicity (except death, e.g., stunted fetus) ; <i>Reproductive Effects:</i> Specific Developmental Abnormalities:Central nervous system ; Ingestion/Oral-Rat TDLo • 1210 µg/kg (35W pre); <i>Reproductive Effects:</i> Effects on Fertility:Pre-implantation mortality ; <i>Reproductive Effects:</i> Effects on Fertility:Post-implantation mortality ; Tumorigen / Carcinogen: Ingestion/Oral-Mouse TDLo • 10.08 mg/kg 12 Week(s)-Continuous; <i>Tumorigenic:</i> Carcinogenic by RTECS criteria ; <i>Lungs, Thorax, or Respiration:</i> Other changes
Iron (0% TO 5%)	7439 -89- 6	Acute Toxicity: Ingestion/Oral-Rat LD50 • 750 mg/kg; <i>Blood:</i> Changes in serum composition (e.g., TP, bilirubin cholesterol) ; <i>Biochemical:</i> Enzyme inhibition, induction, or change in blood or tissue levels:Transaminases ; Ingestion/Oral-Child TDLo • 77 mg/kg; <i>Behavioral:</i> Irritability ; <i>Gastrointestinal:</i> Nausea or vomiting ; <i>Blood:</i> Normocytic anemia ; Multi-dose Toxicity: Ingestion/Oral-Rat TDLo • 105 mg/kg 5 Week(s)-Continuous; <i>Liver:</i> Tumors ; <i>Tumorigenic:</i> Active as anti-cancer agent ; <i>Tumorigenic:</i> Protects against induction of experimental tumors

GHS Properties	Classification
Acute toxicity	EU/CLP • Data lacking UN GHS 3 • Data lacking OSHA HCS 2012 • Data lacking WHMIS 2015 • Data lacking
Skin corrosion/Irritation	EU/CLP • Data lacking UN GHS 3 • Data lacking OSHA HCS 2012 • Data lacking WHMIS 2015 • Data lacking
Serious eye damage/Irritation	EU/CLP • Data lacking UN GHS 3 • Data lacking OSHA HCS 2012 • Data lacking WHMIS 2015 • Data lacking
Skin sensitization	EU/CLP • Skin Sensitizer 1 UN GHS 3 • Skin Sensitizer 1 OSHA HCS 2012 • Skin Sensitizer 1 WHMIS 2015 • Skin Sensitizer 1
	EU/CLP • Respiratory Sensitizer 1

Respiratory sensitization	<p>UN GHS 3 • Respiratory Sensitizer 1 OSHA HCS 2012 • Respiratory Sensitizer 1 WHMIS 2015 • Respiratory Sensitizer 1</p>
Aspiration Hazard	<p>EU/CLP • Data lacking UN GHS 3 • Data lacking OSHA HCS 2012 • Data lacking WHMIS 2015 • Data lacking</p>
Carcinogenicity	<p>EU/CLP • Carcinogenicity 2; Suspected of causing cancer UN GHS 3 • Carcinogenicity 2 OSHA HCS 2012 • Carcinogenicity 2 WHMIS 2015 • Carcinogenicity 2</p>
Germ Cell Mutagenicity	<p>EU/CLP • Data lacking UN GHS 3 • Data lacking OSHA HCS 2012 • Data lacking WHMIS 2015 • Data lacking</p>
Toxicity for Reproduction	<p>EU/CLP • Toxic to Reproduction 1B UN GHS 3 • Toxic to Reproduction 1B OSHA HCS 2012 • Toxic to Reproduction 1B WHMIS 2015 • Toxic to Reproduction 1B</p>
STOT-SE	<p>EU/CLP • Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation UN GHS 3 • Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation OSHA HCS 2012 • Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation WHMIS 2015 • Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation</p>
STOT-RE	<p>EU/CLP • Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2 UN GHS 3 • Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2 OSHA HCS 2012 • Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2 WHMIS 2015 • Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2</p>

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. Cobalt toxicity also results in a progressive diffuse, interstitial pneumonia with a non-productive cough, dyspnea on exertion, interstitial fibrosis and cell damage. Other workers have experienced a sensitized respiratory disease characterized by cough, wheezing and shortness of breath where upon removal from the environment, the symptoms subside.

Chronic (Delayed)

- Chronic exposure to Nickel can cause effects such as rhinitis, sinusitis, nasal septal perforations and asthma have been reported in nickel refinery and nickel plating workers.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation. Cobalt causes a dermatitis of the allergic sensitivity type at points in friction. Contact allergy to nickel is very common in human beings.

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. Ingestion of large amounts of copper may cause damage to the kidneys.

Chronic (Delayed)

- Repeated and prolonged exposure to copper may affect the liver.

Other**Chronic (Delayed)**

- Chronic exposure to Manganese dust and fumes can cause Manganism (Parkinson like disease).

Carcinogenic Effects

- Repeated and prolonged exposure to fumes and dust created in processing this product may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Cobalt (powder)	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 to fumes and dust created in processing this product may cause reproductive effects.

Key to abbreviations

LD = Lethal Dose

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information**12.1 Toxicity**

Components		
Nickel (25% TO 70%)	7440-02-0	Aquatic Toxicity-Fish: 96 Hour(s) LC50 <i>Oncorhynchus mykiss</i> (Rainbow Trout) 0.06 mg/L 28 Day(s) NOEC <i>Cyprinus carpio</i> (Common Carp) 0.0035 µg/L Aquatic Toxicity-Crustacea: 7 Day(s) NOEC <i>Americamysis bahia</i> (Opossum Shrimp) 0.213 mg/L Aquatic Toxicity-Algae and Other Aquatic Plant(s): 96 Hour(s) EC50 <i>Pseudokirchneriella subcapitata</i> (Green Algae) 0.233 mg/L
Cobalt (powder) (0% TO 2%)	7440-48-4	Aquatic Toxicity-Fish: 96 Hour(s) LC50 <i>Pimephales promelas</i> (Fathead Minnow) 3.4 mg/L Aquatic Toxicity-Crustacea: 48 Hour(s) LC50 <i>Daphnia magna</i> (Water Flea) 4.4 mg/L 28 Day(s) NOEC <i>Daphnia magna</i> (Water Flea) 0.0028 mg/L
Copper (20% TO 70%)	7440-50-8	Aquatic Toxicity-Fish: 96 Hour(s) LC50 <i>Osteichthyes</i> (Bony Fishes) 0.0051 mg/L 7 Day(s) NOEC <i>Salmo trutta</i> (Brown Trout) 0.0075 mg/L Aquatic Toxicity-Crustacea: 21 Day(s) NOEC <i>Daphnia magna</i> (Water Flea) 0.002 mg/L 48 Hour(s) EC50 <i>Ceriodaphnia dubia</i> (Water Flea) 0.001 mg/L Aquatic Toxicity-Algae and Other Aquatic Plant(s): 48 Hour(s) EC50 <i>Chlorella sp.</i> (Green Algae) 0.0011 mg/L 7 Day(s) NOEC <i>Laminaria saccharina</i> (Tangleweed, Brown Algae) 0.01 mg/L
Iron (0% TO 5%)	7439-89-6	Aquatic Toxicity-Fish: 96 Hour(s) LC50 <i>Mudskipper</i> (<i>Periophthalmus waltoni</i>) 0.00648 mg/L 7 Day(s) NOEC <i>Brown Trout</i> (<i>Salmo trutta</i>) 0.305 mg/L Aquatic Toxicity-Crustacea: 7 Day(s) NOEC <i>Aquatic Sowbug, Isopod</i> (<i>Idotea balthica</i>) 0.5 mg/L

- The product is not expected to present an environmental hazard.

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	Not Applicable	Not Regulated	Not Applicable	Not Applicable	NDA
TDG	Not Applicable	Not Regulated	Not Applicable	Not Applicable	NDA
IMO/IMDG	Not Applicable	Not Regulated	Not Applicable	Not Applicable	NDA
IATA/ICAO	Not Applicable	Not Regulated	Not Applicable	Not Applicable	NDA

14.6 Special precautions for user

- None specified.

14.7 Transport in bulk according to Annex II of Marpol 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, Pressure(Sudden Release of)

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
Aluminum	7429-90-5	Yes	No	Yes	No	Yes
Chromium	7440-47-3	Yes	No	Yes	No	Yes
Cobalt (powder)	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
Nickel	7440-02-0	Yes	No	Yes	No	Yes
Silicon	7440-21-3	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS 1988 - Classifications of Substances

• 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; B4, D2A (powder)
• Cobalt (powder)	7440-48-4	D2A, D2B
• Aluminum	7429-90-5	B6 (powder); Uncontrolled product according to WHMIS classification criteria
• Nickel	7440-02-0	D2A, D2B; B6, D2A (Raney)
• Silicon	7440-21-3	B4
• Iron	7439-89-6	Uncontrolled product according to WHMIS classification criteria

Canada - WHMIS 1988 - Ingredient Disclosure List

• Copper	7440-50-8	1 %
• Chromium	7440-47-3	0.1 %
• Manganese	7439-96-5	1 %
• Cobalt (powder)	7440-48-4	0.1 %
• Aluminum	7429-90-5	1 %
• Nickel	7440-02-0	0.1 %
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

United States

Labor

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed

• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed
U.S. - OSHA - Specifically Regulated Chemicals		
• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

Environment

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• 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
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	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)

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
- Iron 7439-89-6 Not Listed

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

- Copper 7440-50-8 Not Listed
- Chromium 7440-47-3 Not Listed
- Manganese 7439-96-5 Not Listed
- Cobalt (powder) 7440-48-4 Not Listed
- Aluminum 7429-90-5 Not Listed
- Nickel 7440-02-0 Not Listed
- Silicon 7440-21-3 Not Listed
- Iron 7439-89-6 Not Listed

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

- Copper 7440-50-8 Not Listed
- Chromium 7440-47-3 Not Listed
- Manganese 7439-96-5 Not Listed
- Cobalt (powder) 7440-48-4 Not Listed
- Aluminum 7429-90-5 Not Listed
- Nickel 7440-02-0 Not Listed
- Silicon 7440-21-3 Not Listed
- Iron 7439-89-6 Not Listed

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

- Copper 7440-50-8 Not Listed
- Chromium 7440-47-3 Not Listed
- Manganese 7439-96-5 Not Listed
- Cobalt (powder) 7440-48-4 Not Listed
- Aluminum 7429-90-5 Not Listed
- Nickel 7440-02-0 Not Listed
- Silicon 7440-21-3 Not Listed
- Iron 7439-89-6 Not Listed

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

- 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
- Cobalt (powder) 7440-48-4 0.1 % de minimis concentration
- Aluminum 7429-90-5 1.0 % de minimis concentration (dust or fume only)
- Nickel 7440-02-0 0.1 % de minimis concentration
- Silicon 7440-21-3 Not Listed
- Iron 7439-89-6 Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

United States - California

Environment

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	carcinogen, 7/1/1992 (powder)
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	carcinogen, 10/1/1989 (metallic)
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	Not Listed

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

• Copper	7440-50-8	Not Listed
• Chromium	7440-47-3	Not Listed
• Manganese	7439-96-5	Not Listed
• Cobalt (powder)	7440-48-4	Not Listed
• Aluminum	7429-90-5	Not Listed
• Nickel	7440-02-0	Not Listed
• Silicon	7440-21-3	Not Listed
• Iron	7439-89-6	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
- H261 - In contact with water releases flammable gas
- H302 - Harmful if swallowed
- H319 - Causes serious eye irritation
- H361 - Suspected of damaging fertility or the unborn child.
- H400 - Very toxic to aquatic life
- H410 - Very toxic to aquatic life with long lasting effects
- H412 - Harmful to aquatic life with long lasting effects
- H413 - May cause long lasting harmful effects to aquatic life

Revision Date

- 08/March/2018

Preparation Date

- 13/June/2011

Other Information

- To access SDS online, go to Doncasters.com/EHS/SDS.

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Key to abbreviations

NDA = No Data Available