Safety Data Sheet

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

1.1 Product identifier

Product Name • **Low Alloy Steels**

Synonyms
- 1020; 300M; 4130; 4140; 4330; 4330 M; 4340; 6305; 8620; 8630; A106; A234; A335 P11; A335 P22; A335 P5; A335 P9; A335 P91; A335 P92; A420; A707; A860; AerMet 100; Greek Ascoloy; Hp 9-4-30; Pyrowear Alloy 53; Sanicro 28; SP-75; Z199

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

Relevant identified use(s)
- Solid Cast, Forged and Fabricated Sheet, Plate, Bar, Wire, Tubing, Pipe, Fittings, Structural Shapes

1.3 Details of the supplier of the safety data sheet

Manufacturer
- Wyman-Gordon Company

244 Worcester Street
North Grafton, MA 01536-8001
United States

Telephone (General)
- (508) 839-4441

1.4 Emergency telephone number

3E Company
- 1(866) 519-4752 (Contract Number: 334230)

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
- Classifications and hazards represented in this section may be representative of downstream processing of the solidified material in the event dusts, fumes or small fines are generated.

Skin Irritation 2 - H315
Skin Sensitization 1 - H317
Eye Irritation 2 - H319
Respiratory Sensitization 1 - H334
Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
Carcinogenicity 2 - H351
Reproductive Toxicity 2 - H361
Specific Target Organ Toxicity Repeated Exposure 1 - H372
Specific Target Organ Toxicity Repeated Exposure 2 - H373

DSD/DPD
- Irritant (Xi)

Carcinogenic Substances - Category 3
Toxic (T)
Substances Toxic To Reproduction - Category 3
R25, R36/37/38, R40, R42/43, R48/23, R63

2.2 Label Elements

CLP

DANGER

Hazard statements

- H315 - Causes skin irritation
- H317 - May cause an allergic skin reaction
- H319 - Causes serious eye irritation
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 - May cause respiratory irritation
- H351 - Suspected of causing cancer.
- H361 - Suspected of damaging fertility or the unborn child.
- H372 - Causes damage to organs - Central Nervous System (CNS) through prolonged or repeated exposure
- H373 - May cause damage to organs - Lungs 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.
- P272 - Contaminated work clothing should not be allowed out of the workplace.
- P281 - Use personal protective equipment as required.
- P285 - In case of inadequate ventilation wear respiratory protection.

Response

- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
- P321 - Specific treatment, see supplemental first aid information.
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
- P362 - Take off contaminated clothing and wash before reuse.
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313 - If eye irritation persists: Get medical advice/attention.
- 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.

DSD/DPD

Risk phrases

- R25 - Toxic if swallowed.
- R36/37/38 - Irritating to eyes, respiratory system and skin.
- R40 - Limited evidence of a carcinogenic effect.
- R42/43 - May cause sensitisation by inhalation and skin contact.
- R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation.
- R63 - Possible risk of harm to the unborn child.

Safety phrases

- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S36 - Wear suitable protective clothing.

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

- May form combustible dust concentrations in air.
  According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD

- May form combustible dust concentrations in air.
  According to European Directive 1999/45/EC this preparation 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

- Classifications and hazards represented in this section may be representative of downstream processing of the solidified material in the event dusts, fumes or small fines are generated.
  Skin Irritation 2 - H315
  Skin Sensitization 1A - H317
  Eye Irritation 2 - H319
  Respiratory Sensitization 1A - H334
  Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
  Carcinogenicity 2 - H351
  Reproductive Toxicity 2 - H361
  Specific Target Organ Toxicity Repeated Exposure 1 - H372
  Combustible Dust

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- Causes skin irritation - H315
  May cause an allergic skin reaction - H317
  Causes serious eye irritation - H319
  May cause allergy or asthma symptoms or breathing difficulties if inhaled - H334
  May cause respiratory irritation - H335
  Suspected of causing cancer. - H351
  Suspected of damaging fertility or the unborn child. - H361
  Causes damage to organs - Central Nervous System (CNS) through prolonged or repeated exposure - H372
  May form combustible dust concentrations in air.

Precautionary statements

Prevention

- Obtain special instructions before use. - P201
  Do not handle until all safety precautions have been read and understood. - P202
  Do not breathe dust. - P260
  Wash thoroughly after handling. - P264
  Do not eat, drink or smoke when using this product. - P270
  Use only outdoors or in a well-ventilated area. - P271
  Contaminated work clothing should not be allowed out of the workplace. - P272
  Wear protective gloves/protective clothing/eye protection/face protection. - P280

In case of inadequate ventilation wear respiratory protection. - P285

Response
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
  Call a POISON CENTER or doctor/physician if you feel unwell. - P312
  If on skin: Wash with plenty of water .
  Specific treatment, see supplemental first aid information. - P321
  If skin irritation or rash occurs: Get medical advice/attention. - P333+P313
  Take off contaminated clothing and wash before reuse. - P362
  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
  If eye irritation persists: Get medical advice/attention. - P337+P313
  Get medical advice/attention if you feel unwell. - P314
  IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician. - P309+P311
  IF exposed or concerned: Get medical advice/attention. - P308+P313

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

2.3 Other hazards

OSHA HCS 2012
- 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
- Classifications and hazards represented in this section may be representative of downstream processing of the solidified material in the event dusts, fumes or small fines are generated.
  Other Toxic Effects - D2A
  Other Toxic Effects - D2B

2.2 Label elements

WHMIS

- Other Toxic Effects - D2A
  Other Toxic Effects - D2B

2.3 Other hazards

WHMIS
- May form combustible dust concentrations in air.
  In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

See Section 12 for Ecological Information.

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Iron	**CAS:**7439-89-6 **EC Number:**231-096-4	70% TO 99.5%	Ingestion/Oral-Rat LD50 • 30 g/kg	**EU DSD/DPD:** Self Classified: Xi, R37 **EU CLP:** Self Classified: STOT RE 3, H335 **OSHA HCS 2012:** STOT RE 3: Resp. Irrit.	NDA
Chromium	**CAS:**7440-47-3 **EC Number:**231-157-5	0% TO 20%	NDA	**EU DSD/DPD:** Self Classified: Xi, R37 **EU CLP:** Self Classified: STOT SE 3: Resp. Irrit., H335 **OSHA HCS 2012:** STOT SE 3: Resp. Irrit.	NDA
Molybdenum	**CAS:**7439-98-7 **EC Number:**231-107-2	0% TO 15%	NDA	**EU DSD/DPD:** Self Classified: Xi, R36/37/38 **EU CLP:** Self Classified: Skin Irrit. 2, H319; Eye Irrit. 2, H315; STOT SE 3: Resp. Irrit., H335 **OSHA HCS 2012:** Skin Irrit. 2; Eye Irrit. 2; STOT SE 3: Resp. Irrit.	NDA
Manganese	**CAS:**7439-96-5 **EC Number:**231-105-1	0% TO 5%	Ingestion/Oral-Rat LD50 • 9 g/kg	**EU DSD/DPD:** Self Classified: Repr. 3, R63 **EU CLP:** Self Classified: STOT RE 1 - CNS, H372; Repr. 2, H361 **OSHA HCS 2012:** Eye Irrit. 2B; Repr. 2; STOT RE 1 - CNS	NDA
Nickel	**CAS:**7440-02-0 **EC Number:**231-111-4	0% TO 11.1%	NDA	**EU DSD/DPD:** EU CLP, Annex VI, Table 3.2: Carc.Cat.3, R40; T, R48/23; R43 **EU CLP:** Self Classified: Carc. 2, H351; STOT RE 1, H372; Skin Sens. 1, H317 **OSHA HCS 2012:** Carc . 2; Skin Sens. 1A; Resp. Sens. 1A; STOT RE 2 (Lungs)	NDA
Cobalt	**CAS:**7440-48-4 **EC Number:**231-158-0 **UN:**UN1318	0% TO 13.4%	Ingestion/Oral-Rat LD50 • 6171 mg/kg	**EU DSD/DPD:** Annex I - R42/43 R53 **EU CLP:** Annex VI - Resp. Sens. 1, H334; Skin Sens., H317; Aquatic Chronic 4, H413 **OSHA HCS 2012:** Resp Sens. 1; Skin Sens. 1	NDA
Aluminum	**CAS:**7429-90-5 **EC Number:**231-072-3 **UN:**UN1309	0% TO 5%	NDA	**EU DSD/DPD:** EU CLP, Annex VI, Table 3.2: F, R15, R17 **EU CLP:** Annex VI: Water-react. 2, H261; Pyr. Sol. 1, H250 **OSHA HCS 2012:** Not Classified - Criteria not met	NDA
Copper	**CAS:**7440-50-8 **EC Number:**231-159-6	0% TO 2%	NDA	**EU DSD/DPD:** Self Classified: Repr 3. R63; Xi, R36 **EU CLP:** Self Classified: Repr 2, H361; Eye Irrit. 2, H319 **OSHA HCS 2012:** Repr. 2, STOT SE 3: Resp. Irrit.; Eye Irrit. 2	NDA
Silicon	**CAS:**7440-21-3 **EC Number:**231-130-8 **UN:**UN1346	0% TO 5%	Ingestion/Oral-Rat LD50 • 3160 mg/kg	**EU DSD/DPD:** Self Classified - Xi, 37/38; Xn, R22 **EU CLP:** Self Classified - Skin Irrit 2 H315; STOT SE 3 H335 **OSHA HCS 2012:** Eye Irrit 2B, Skin Irrit 2, STOT SE 3 (resp)	NDA
Titanium	**CAS:**7440-32-6 **UN:**UN1352 **EINECS:**231-142-3	0% TO 1%	NDA	**EU DSD/DPD:** Self Classified: Repr. 3, R63 **EU CLP:** Self Classified: Repr. 2, H361 **OSHA HCS 2012:** Repr. 2	NDA
Tungsten	**CAS:**7440-33-7 **EC Number:**231-143-9	0% TO 21%	NDA	**EU DSD/DPD:** Self Classified: Xi, R36/38 **EU CLP:** Self Classified: Skin Irrit. 2, H319; Eye Irrit. 2, H315 **OSHA HCS 2012:** Skin Irrit. 2; Eye Irrit. 2	NDA
Carbon Black	**CAS:**1333-86-4 **EC Number:**215-609-9	0% TO 4%	Ingestion/Oral-Rat LD50 • >15400 mg/kg Skin-Rabbit LD50 • >3 g/kg	**EU DSD/DPD:** None **EU CLP:** None **OSHA HCS 2012:** Carc. 2	NDA
Vanadium	**CAS:**7440-62-2 **EC Number:**231-171-1 **UN:**UN3285	0% TO 15%	NDA	**EU DSD/DPD:** Self Classified: Xi, R38 **EU CLP:** Self Classified: Skin Irrit. 2, H319 **OSHA HCS 2012:** Skin Irrit. 2	NDA
Phosphorus	**CAS:**7723-14-0 **EC Number:**231-768-7	0% TO 1%	NDA	**EU DSD/DPD:** Self Classified: C, R35; T+, R28 ; R17 **EU CLP:** Self Classified: Flam. Sol. 1, H228; Acute Tox 1 (oral), H300; Skin Corr. 1A, H314; Eye Dam.	NDA

	UN:UN1381			1, H318; **OSHA HCS 2012:** Acute Tox 1 (oral); Skin Corr. 1A; Eye Dam. 1; Pyr. Sol	
Sulfur	**CAS:**7704-34-9 **EC Number:**231-722-6 **UN:**UN1350	0% TO 0.5%	NDA	**EU DSD/DPD:** Annex I - Xi; R38 **EU CLP:** Annex VI - Skin Irrit. 2; H315 **OSHA HCS 2012:** Eye Irrit 2, STOT SE 3 (resp)	NDA

See Section 11 for Toxicological Information.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention immediately.

Skin
- Removal of solidified molten material from skin requires medical assistance. Wash skin with soap and water. Remove and isolate contaminated clothing. If irritation develops and persists, get medical 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
- Get medical attention immediately. Never give anything by mouth to an unconscious person.

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 appropriate extinguisher for surrounding materials when solid alloy is involved. Use Class D fire extinguishers for fires involving powders or dust.

Unsuitable Extinguishing Media
- Do not use water on finely divided alloy.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- No fire or explosion hazard with solid metal alloys. A fire hazard may exist when fine turnings or chips are produced and during disposal of scrap containing chips or fines. 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.

Hazardous Combustion Products
- Toxic metal fumes of nickel, chromium, aluminum, vanadium, iron, copper, tungsten, molybdenum, and manganese may be emitted.

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 the area before entry. 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 • As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep out of low areas. Keep unauthorized personnel away. Stay upwind. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

6.2 Environmental precautions

• Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures • 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).
Use clean nonsparking tools to collect material.
Carefully shovel or sweep up spilled material and place in suitable container.
All equipment used when handling the product must be grounded.

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 • Use only in well ventilated areas. Keep away from heat, sparks, and flame. Keep material dry. Minimize dust generation and accumulation. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. 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. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe dust. 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 container tightly closed. Protect from physical damage and contact with water. Store in a cool, dry, well-ventilated 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
Copper (7440-50-8)	STELs	Not established	Not established	Not established	Not established	2.5 mg/m3 STEL (dust); 0.6 mg/m3 STEL (fume)
	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)
Phosphorus (7723-14-0)	STELs	Not established	Not established	Not established	Not established	0.1 mg/m3 STEL (listed under Yellow phosphorus)
	TWAs	Not established	Not established	Not established	0.1 mg/m3 TWAEV (yellow)	0.05 mg/m3 TWA (listed under Yellow

						phosphorus)
Carbon Black (1333-86-4)	STELs	Not established	Not established	Not established	Not established	8 mg/m3 STEL (total dust)
	TWAs	3 mg/m3 TWA (inhalable fraction)	Not established	3 mg/m3 TWA (inhalable)	3.5 mg/m3 TWAEV	4 mg/m3 TWA (total dust)
Manganese (7439-96-5)	STELs	Not established	Not established	Not established	3 mg/m3 STEV (fume)	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	5 mg/m3 TWAEV (dust); 1 mg/m3 TWAEV (fume)	0.15 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 (7440-02-0)	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	France	Germany DFG	Germany TRGS	Italy
Chromium (7440-47-3)	TWAs	2 mg/m3 TWA	2 mg/m3 TWA [VME] (indicative limit)	Not established	2 mg/m3 TWA AGW (inhalable fraction, exposure factor 1)	0.5 mg/m3 TWA
Copper (7440-50-8)	STELs	Not established	2 mg/m3 STEL [VLCT] (dust, as Cu)	Not established	Not established	Not established
	TWAs	Not established	0.2 mg/m3 TWA [VME] (fume); 1 mg/m3 TWA [VME] (dust, as Cu)	Not established	Not established	Not established
	Ceilings	Not established	Not established	0.2 mg/m3 Peak (inhalable fraction)	Not established	Not established
	MAKs	Not established	Not established	0.1 mg/m3 TWA MAK (inhalable fraction)	Not established	Not established
Phosphorus (7723-14-0)	TWAs	Not established	Not established	Not established	0.01 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, exposure factor 2)	Not established
	Ceilings	Not established	Not established	0.02 mg/m3 Peak (inhalable fraction)	Not established	Not established
	MAKs	Not established	Not established	0.01 mg/m3 TWA	Not established	Not established

				MAK (inhalable fraction)		
Carbon Black (1333-86-4)	TWAs	Not established	3.5 mg/m3 TWA [VME]	Not established	Not established	Not established
Manganese (7439-96-5)	TWAs	Not established	1 mg/m3 TWA [VME] (fume, as Mn)	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)	Not established
	Ceilings	Not established	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
	MAKs	Not established	Not established	0.2 mg/m3 TWA MAK (inhalable fraction); 0.02 mg/m3 TWA MAK (respirable fraction)	Not established	Not established
Aluminum (7429-90-5)	TWAs	Not established	10 mg/m3 TWA [VME] (metal); 5 mg/m3 TWA [VME] (dust)	Not established	Not established	Not established
	MAKs	Not established	Not established	4 mg/m3 TWA MAK (dust, inhalable fraction); 1.5 mg/m3 TWA MAK (dust, respirable fraction)	Not established	Not established
Nickel (7440-02-0)	TWAs	Not established	1 mg/m3 TWA [VME]; 1 mg/m3 TWA [VME] (metal gratings)	Not established	Not established	Not established
Silicon (7440-21-3)	TWAs	Not established	10 mg/m3 TWA [VME]	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	NIOSH	OSHA	Taiwan
Chromium (7440-47-3)	TWAs	0.5 mg/m3 TWA	1 mg/m3 TWA	1 mg/m3 TWA
Copper (7440-50-8)	TWAs	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)	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)
Phosphorus (7723-14-0)	TWAs	Not established	Not established	0.1 mg/m3 TWA
Carbon Black (1333-86-4)	TWAs	3.5 mg/m3 TWA; 0.1 mg/m3 TWA (Carbon black in presence of Polycyclic aromatic hydrocarbons, as PAH)	3.5 mg/m3 TWA	3.5 mg/m3 TWA
Manganese (7439-96-5)	TWAs	1 mg/m3 TWA (fume)	Not established	1 mg/m3 TWA (fume)
	Ceilings	Not established	5 mg/m3 Ceiling (fume)	Not established
	STELs	3 mg/m3 STEL	Not established	Not established
Cobalt (7440-48-4)	TWAs	0.05 mg/m3 TWA (dust and fume)	0.1 mg/m3 TWA (dust and fume)	0.05 mg/m3 TWA (dust and fume)
Aluminum (7429-90-5)	TWAs	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)	Not established
Nickel	TWAs	0.015 mg/m3 TWA	1 mg/m3 TWA	1 mg/m3 TWA

(7440-02-0)				
Tungsten (7440-33-7)	STELs	10 mg/m3 STEL	Not established	Not established
	TWAs	5 mg/m3 TWA	Not established	Not established
Silicon (7440-21-3)	TWAs	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)	Not established
Vanadium (7440-62-2)	Ceilings	0.05 mg/m3 Ceiling (except Vanadium metal and Vanadium carbide, dust and fume, as V, 15 min) *as Vanadium compounds*	0.5 mg/m3 Ceiling (respirable dust, as V2O5); 0.1 mg/m3 Ceiling (fume, as V2O5)	Not established
	STELs	3 mg/m3 STEL (listed under Ferrovanadium dust)	Not established	Not established
	TWAs	1 mg/m3 TWA (listed under Ferrovanadium dust)	Not established	Not established

Exposure Control Notations

Italy

•Nickel (7440-02-0): **Carcinogens:** (Category 3 Carcinogen)

France

•Nickel (7440-02-0): **Carcinogens:** (Carcinogen category 3)

•Vanadium (7440-62-2): **Mutagens:** (Mutagen categories 1,2,3) | **Reproductive Toxins:** (Reproductive Toxin categories 1,2,3)

Germany TRGS

•Cobalt (7440-48-4): **Carcinogens:** (Category 3 (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

•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))

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

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

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

•Carbon Black (1333-86-4): **Carcinogens:** (Category 3B (could be carcinogenic for man, inhalable fraction))

•Vanadium (7440-62-2): **Carcinogens:** (Category 2 (considered to be carcinogenic for man))

•Phosphorus (7723-14-0): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

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. It is recommended 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 supression 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 an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters.

Eye/Face

- Wear safety goggles.

Skin/Body	• Wear appropriate gloves. Wear protective clothing
Environmental Exposure Controls	• Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

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

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

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Low Alloy Steels are solid at room temperature with a metallic silver or gray color and no odor.
Color	Metallic silver or gray.	Odor	No odor.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point	Data lacking
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Water Solubility	Insoluble
Viscosity	Data lacking	Explosive Properties	Not Explosive.
Oxidizing Properties:	Not an Oxidizer.		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Not Flammable.		
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

- Avoid creating dusty airborne conditions. Violent explosion can occur when water comes in contact with molten metal.

10.5 Incompatible materials

- Avoid contact with acids or fluorine. Molten lithium attacks iron alloys.

10.6 Hazardous decomposition products

- Toxic metal oxide fumes.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Molybdenum (0% TO 15%)	7439-98-7	**Reproductive:** Ingestion/Oral-Rat TDLo • 5800 µg/kg (30W pre/1-20D preg); *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**
Manganese (0% TO 5%)	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**
Copper (0% TO 2%)	7440-50-8	**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**
Silicon (0% TO 5%)	7440-21-3	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 3160 mg/kg; **Irritation:** Eye-Rabbit • 3 mg • Mild irritation
Titanium (0% TO 1%)	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 21%)	7440-33-7	**Irritation:** Eye-Rabbit • 500 mg 24 Hour(s) • Mild irritation; Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation
Carbon Black (0% TO 4%)	1333-86-4	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • >15400 mg/kg; *Behavioral*:**Somnolence (general depressed activity)**; Skin-Rabbit LD50 • >3 g/kg; **Tumorigen / Carcinogen:** Inhalation-Rat TCLo • 11600 µg/m³ 18 Hour(s) 2 Year(s)-Intermittent; *Tumorigenic*:**Carcinogenic by RTECS criteria**; *Lungs, Thorax, or Respiration*:**Tumors**
Phosphorus (0% TO 1%)	7723-14-0	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 11.5 mg/kg; Inhalation-Rat LCLo • 150 mg/m³; *Cardiac*:**EKG changes not diagnostic of above**; *Liver*:**Fatty liver degeneration**; *Kidney, Ureter, and Bladder*:**Other changes**; **Multi-dose Toxicity:** Ingestion/Oral-Rat TDLo • 12 mg/kg 4 Day(s)-Intermittent; *Liver*:**Hepatitis (hepatocellular necrosis), diffuse**; *Blood*:**Changes in serum composition (e.g., TP, bilirubin cholesterol)**; *Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels*:**Transaminases**; **Reproductive:** Ingestion/Oral-Rat TDLo • 11 µg/kg (1-22D preg); *Reproductive Effects:Effects on Fertility*:**Female fertility index**; *Reproductive Effects:Effects on Fertility*:**Post-implantation mortality**; *Reproductive Effects:Effects on Fertility*:**Litter size (e.g., # fetuses per litter; measured before birth)**
Sulfur (0% TO 0.5%)	7704-34-9	**Irritation:** Eye-Human • 8 ppm

GHS Properties	Classification
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 2 **OSHA HCS 2012**•Carcinogenicity 2
Germ Cell Mutagenicity	**EU/CLP**•Data lacking **OSHA HCS 2012**•Data lacking
Skin corrosion/Irritation	**EU/CLP**•Skin Irritation 2 **OSHA HCS 2012**•Skin Irritation 2
Skin sensitization	**EU/CLP**•Skin Sensitizer 1A **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; Specific Target Organ Toxicity Repeated Exposure 2
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
Respiratory sensitization	**EU/CLP**•Respiratory Sensitizer 1A **OSHA HCS 2012**•Respiratory Sensitizer 1A
Serious eye damage/Irritation	**EU/CLP**•Eye Irritation 2 **OSHA HCS 2012**•Eye Irritation 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)
- May cause allergy or asthma symptoms or breathing difficulties if inhaled. Inhalation of dusts or fumes can cause severe pulmonary reactions including fibrosis, ephysema and pneumothorax. Inhalation of dusts from this product may cause lung problems.

Skin

Acute (Immediate)
- May cause skin sensitization. Symptoms include redness, and skin rash. Causes skin irritation.

Chronic (Delayed)
- No data available

Eye

Acute (Immediate)
- Causes serious eye irritation.

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

Other

Chronic (Delayed)
- Repeated and prolonged exposure may affect the central nervous system.

Carcinogenic Effects
- Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects

	CAS	IARC	NTP
Carbon Black	1333-86-4	Group 2B-Possible Carcinogen	Not Listed
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 • Animal tests for components have shown adverse reproductive effects.

Key to abbreviations

LC = Lethal Concentration
LD = Lethal Dose
TC = Toxic Concentration
TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Material Data Lacking.

12.2 Persistence and degradability

- In fresh and salt water, Low Alloy Steels will eventually form metal oxides and precipitate in sediments. Alloy may persist in the environment for long periods based upon the corrosive resistance, insolubility in salt water, and non-biodegradable properties.

12.3 Bioaccumulative potential

- There is little tendency for bioaccumulation along food chain.

12.4 Mobility in Soil

- Material Data Lacking.

12.5 Results of PBT and vPvB assessment

- The PBT and vPvB assessment has not 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 known.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Not relevant.

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)

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Aluminum	7429-90-5	Yes	Yes	Yes
Carbon Black	1333-86-4	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
Phosphorus	7723-14-0	No	Yes	Yes
Silicon	7440-21-3	Yes	Yes	Yes
Sulfur	7704-34-9	Yes	Yes	Yes
Titanium	7440-32-6	No	Yes	No
Tungsten	7440-33-7	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	Yes	Yes

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**	**EU ELNICS**
Aluminum	7429-90-5	Yes	No	Yes	Yes	No
Carbon Black	1333-86-4	Yes	No	Yes	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	No
Cobalt	7440-48-4	Yes	No	Yes	Yes	No
Copper	7440-50-8	Yes	No	Yes	Yes	No
Iron	7439-89-6	Yes	No	Yes	Yes	No
Manganese	7439-96-5	Yes	No	Yes	Yes	No
Molybdenum	7439-98-7	Yes	No	Yes	Yes	No
Nickel	7440-02-0	Yes	No	Yes	Yes	No
Phosphorus	7723-14-0	Yes	No	Yes	Yes	No
Silicon	7440-21-3	Yes	No	Yes	Yes	No
Sulfur	7704-34-9	Yes	No	Yes	Yes	No
Titanium	7440-32-6	Yes	No	Yes	Yes	No
Tungsten	7440-33-7	Yes	No	Yes	Yes	No
Vanadium	7440-62-2	Yes	No	Yes	Yes	No

Inventory (Con't.)				
Component	**CAS**	**Japan ENCS**	**Korea KECL**	**TSCA**
Aluminum	7429-90-5	No	Yes	Yes
Carbon Black	1333-86-4	Yes	Yes	Yes
Chromium	7440-47-3	No	Yes	Yes
Cobalt	7440-48-4	No	Yes	Yes
Copper	7440-50-8	No	Yes	Yes
Iron	7439-89-6	No	Yes	Yes
Manganese	7439-96-5	No	Yes	Yes
Molybdenum	7439-98-7	No	Yes	Yes
Nickel	7440-02-0	No	Yes	Yes
Phosphorus	7723-14-0	No	Yes	Yes
Silicon	7440-21-3	No	Yes	Yes
Sulfur	7704-34-9	No	Yes	Yes
Titanium	7440-32-6	No	Yes	Yes
Tungsten	7440-33-7	No	Yes	Yes
Vanadium	7440-62-2	No	Yes	Yes

Australia

Labor

Australia - Work Health and Safety Regulations - Hazardous Substances Requiring Health Monitoring

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Australia - High Volume Industrial Chemicals List

•Copper	7440-50-8	
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	
•Chromium	7440-47-3	
•Manganese	7439-96-5	
•Cobalt	7440-48-4	Not Listed
•Aluminum	7429-90-5	
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	
•Silicon	7440-21-3	
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	

Australia - List of Designated Hazardous Substances - Classification

•Copper	7440-50-8	Self classification required (dust, fume and mist)
•Phosphorus	7723-14-0	F R11, R16, R52, R53 (red)
•Carbon Black	1333-86-4	Self classification required
•Chromium	7440-47-3	Self classification required
•Manganese	7439-96-5	Self classification required (dust)
•Cobalt	7440-48-4	R42/43, R53 (including dust and fume)
•Aluminum	7429-90-5	F R11, R15 (powder, stabilised)
•Molybdenum	7439-98-7	Self classification required
•Nickel	7440-02-0	T Carc.Cat.3 R40, R48/23, R43; T Carc.Cat.3 R40, R48/23, R43, R52, R53 (powder, particle diameter <1 mm)
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Self classification required
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Xi R38

Environment

Australia - National Pollutant Inventory (NPI) Substance List

•Copper	7440-50-8	10 tonne/yr Threshold category 1 (Copper and compounds); 2000 tonne/yr Threshold category 2b

		(Copper and compounds); 60000 MWH Threshold category 2b (Copper and compounds); 20 MW Threshold category 2b (Copper and compounds)
•Phosphorus	7723-14-0	3 tonne/yr Threshold category 3 (total)
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	10 tonne/yr Threshold category 1 (Manganese and compounds)
•Cobalt	7440-48-4	10 tonne/yr Threshold category 1 (Cobalt and compounds)
•Aluminum	7429-90-5	Not Listed
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	10 tonne/yr Threshold category 1 (Nickel and compounds); 2000 tonne/yr Threshold category 2b (Nickel and compounds); 60000 MWH Threshold category 2b (Nickel and compounds); 20 MW Threshold category 2b (Nickel and compounds)
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Australia - Ozone Protection Act - Scheduled Substances		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Australia - Priority Existing Chemical Program		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	Not Listed
•Cobalt	7440-48-4	Not Listed
•Aluminum	7429-90-5	Not Listed
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	Standby chemical
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed

•Sulfur	7704-34-9	Not Listed

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Copper	7440-50-8	Uncontrolled product according to WHMIS classification criteria
•Phosphorus	7723-14-0	B4, D1A, E (listed under Yellow phosphorus)
•Carbon Black	1333-86-4	D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Carbon Black, non-respirable on Health Canada's WHMIS Division website.)
•Chromium	7440-47-3	Uncontrolled product according to WHMIS classification criteria
•Manganese	7439-96-5	D2A (including powder)
•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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Uncontrolled product according to WHMIS classification criteria
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	B4

Canada - WHMIS - Ingredient Disclosure List

•Copper	7440-50-8	1 %
•Phosphorus	7723-14-0	1 %
•Carbon Black	1333-86-4	1 %
•Chromium	7440-47-3	0.1 %
•Manganese	7439-96-5	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 %
•Vanadium	7440-62-2	1 %
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Environment

Canada - 2004 NPRI (National Pollutant Release Inventory)

•Copper	7440-50-8	Part 1, Group 1 Substance
•Phosphorus	7723-14-0	Part 1, Group 1 Substance
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Part 1, Group 1 Substance
•Manganese	7439-96-5	Part 1, Group 1 Substance
•Cobalt	7440-48-4	Part 1, Group 1 Substance

•Aluminum	7429-90-5	Part 1, Group 1 Substance (dust or fume)
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	Part 1, Group 1 Substance
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Part 1, Group 1 Substance (except when in an alloy)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Canada - 2005 NPRI (National Pollutant Release Inventory)		
•Copper	7440-50-8	Part 1, Group 1 Substance
•Phosphorus	7723-14-0	Part 1, Group 1 Substance
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Part 1, Group 1 Substance
•Manganese	7439-96-5	Part 1, Group 1 Substance
•Cobalt	7440-48-4	Part 1, Group 1 Substance
•Aluminum	7429-90-5	Part 1, Group 1 Substance (dust or fume)
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	Part 1, Group 1 Substance
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Part 1, Group 1 Substance
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Canada - CEPA - Greenhouse Gases Subject to Mandatory Reporting		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Canada - CEPA - Priority Substances List		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
Canada - DWQ (Drinking Water Quality) - IMACs		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed

•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Other

Canada - Accelerated Reduction/Elimination of Toxics (ARET)

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Canada New Brunswick

Environment

Canada - New Brunswick - Ozone Depleting Substances - Schedule A

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Canada - New Brunswick - Ozone Depleting Substances - Schedule B

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed

•Sulfur	7704-34-9	Not Listed

Europe

Other

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	F; R11 R16 R52-53
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	Not Listed
•Cobalt	7440-48-4	R42/43 R53
•Aluminum	7429-90-5	F; R11 R15
•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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Xi; R38

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	F R:11-16-52/53 S:(2)-7-43-61
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Xi R:38 S:(2)-46

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	S:(2)-7-43-61
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	S:(2)-46

Germany

Environment

Germany - Water Classification (VwVwS) - Annex 1

•Copper	7440-50-8	ID Number 1443, not considered hazardous to water
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	ID Number 1742, not considered hazardous to water
•Chromium	7440-47-3	ID Number 1443, not considered hazardous to water
•Manganese	7439-96-5	ID Number 1443, not considered hazardous to water
•Cobalt	7440-48-4	ID Number 1443, not considered hazardous to water
•Aluminum	7429-90-5	ID Number 1443, not considered hazardous to water
•Molybdenum	7439-98-7	ID Number 1443, not considered hazardous to water
•Nickel	7440-02-0	Not Listed
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	ID Number 1443, not considered hazardous to water
•Vanadium	7440-62-2	ID Number 1443, not considered hazardous to water
•Iron	7439-89-6	ID Number 748, not considered hazardous to water
•Titanium	7440-32-6	ID Number 1443, not considered hazardous to water
•Sulfur	7704-34-9	ID Number 842, not considered hazardous to

		water
Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	Not Listed
•Cobalt	7440-48-4	Not Listed
•Aluminum	7429-90-5	Not Listed
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	ID Number 7182, hazard class 2 - hazard to waters (footnote 47)
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	ID Number 753, hazard class 1 - low hazard to waters (colloidal)
Germany - Water Classification (VwVwS) - Annex 3		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	Not Listed
•Cobalt	7440-48-4	Not Listed
•Aluminum	7429-90-5	Not Listed
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	ID Number 7616, hazard class 2 - hazard to waters (particle size <0.1 mm)
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - OSHA - Specifically Regulated Chemicals		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

Environment

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	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)
•Phosphorus	7723-14-0	1 lb final RQ; 0.454 kg final RQ
•Carbon Black	1333-86-4	Not Listed
•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	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	1 lb EPCRA RQ
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	100 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solution form)
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting		
•Copper	7440-50-8	1.0 % de minimis

		concentration
•Phosphorus	7723-14-0	1.0 % de minimis concentration (yellow or white)
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	1.0 % de minimis concentration
•Manganese	7439-96-5	1.0 % de minimis concentration
•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
•Vanadium	7440-62-2	1.0 % de minimis concentration (except when contained in an alloy)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Basis for Listing - Appendix VII		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Included in waste streams: F032, F034, F035, F037, F038, F039
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Included in waste stream: F039
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Constituents for Detection Monitoring		
•Copper	7440-50-8	(total)
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed

•Chromium	7440-47-3	(total)
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	(total)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - D Series Wastes - Max Conc of Contaminants for the Tox Characteristic		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	5.0 mg/L regulatory level
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	hazardous constituent - no waste number
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - List for Hazardous Constituents		
•Copper	7440-50-8	(total)
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	(total)
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	(total)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards		

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	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
•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
•Vanadium	7440-62-2	4.3 mg/L (wastewater); 1.6 mg/L TCLP (nonwastewater)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - RCRA (Resource Conservation & Recovery Act) - TSD Facilities Ground Water Monitoring		
•Copper	7440-50-8	(total)
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	(total)
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	(total)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

United States - California

Environment

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

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	carcinogen, initial date 2/21/03 (airborne, unbound particles of respirable size)
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	Not Listed
•Cobalt	7440-48-4	carcinogen, initial date 7/1/92 (powder)
•Aluminum	7429-90-5	Not Listed
•Molybdenum	7439-98-7	Not Listed
•Nickel	7440-02-0	carcinogen, initial date 10/1/89 (metallic)
•Silicon	7440-21-3	Not Listed
•Tungsten	7440-33-7	Not Listed
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed

•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed

•Chromium	7440-47-3	Not Listed
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

United States - Pennsylvania

Labor

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

•Copper	7440-50-8	(dust and fume)
•Phosphorus	7723-14-0	
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	
•Manganese	7439-96-5	
•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
•Vanadium	7440-62-2	(dust or fume)
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

•Copper	7440-50-8	Not Listed
•Phosphorus	7723-14-0	Not Listed
•Carbon Black	1333-86-4	Not Listed
•Chromium	7440-47-3	
•Manganese	7439-96-5	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
•Vanadium	7440-62-2	Not Listed
•Iron	7439-89-6	Not Listed
•Titanium	7440-32-6	Not Listed
•Sulfur	7704-34-9	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)

- H250 - Catches fire spontaneously if exposed to air
  H260 - In contact with water releases flammable gases which may ignite spontaneously
  H261 - In contact with water releases flammable gas

H413 - May cause long lasting harmful effects to aquatic life
H228 - Flammable solid
H318 - Causes serious eye damage
H314 - Causes severe skin burns and eye damage.
H300 - Fatal if swallowed

R15 - Contact with water liberates extremely flammable gases.
R17 - Spontaneously flammable in air.
R22 - Harmful if swallowed.
R28 - Very toxic if swallowed.
R35 - Causes severe burns.
R36 - Irritating to eyes.
R36/38 - Irritating to eyes and skin.
R37 - Irritating to respiratory system.
R43 - May cause sensitisation by skin contact.
R53 - May cause long-term adverse effects in the aquatic environment.

Last Revision Date	• 17/December/2014
Preparation Date	• 01/October/2009
Disclaimer/Statement of Liability	• The information herein is given in good faith but no warranty, expressed or implied, is made.

Key to abbreviations
NDA = No data available