



CEMENTED TUNGSTEN CARBIDE CUTTING TOOLS; UNCOATED OR ALTIN COATED; SDS GROUP 12

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Date of Issue: 10/08/2019

Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: CEMENTED TUNGSTEN CARBIDE CUTTING TOOLS; UNCOATED OR ALTIN COATED; SDS GROUP 12

This product covers solid metal blanks for manufacturing cutting tools, this SDS and the hazards and information described below apply to this product if the materials contained within the cutting tool(s) become available during processing conditions, including dusts and particulates.

1.2. Intended Use of the Product

Cutting Tools for manufacturing industries. When used as intended, this product is physiologically inert. Do not modify or resharpen product; return tools to Harvey Tool Company for alteration.

1.3. Name, Address, and Telephone of the Responsible Party

Company

Harvey Tool Company, LLC
428 Newburyport Turnpike
Rowley, MA 01969
800-645-5609

Harveysales@harveyperformance.com

1.4. Emergency Telephone Number

Emergency Number : Within USA and Canada: 1-800-424-9300 or +1-703-527-3887 (collect calls accepted)

For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US/CA Classification

Acute Tox. 4 (Oral)	H302
Skin Irrit. 2	H315
Eye Irrit. 2	H319
Resp. Sens. 1B	H334
Skin Sens. 1	H317
Carc. 1B	H350
Repr. 2	H361
STOT RE 1	H372
Aquatic Acute 1	H400
Aquatic Chronic 1	H410

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

2.2. Label Elements

GHS-US/CA Labeling

Hazard Pictograms (GHS-US/CA)



Signal Word (GHS-US/CA)

: Danger

Hazard Statements (GHS-US/CA)

- : H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H319 - Causes serious eye irritation.
H334 - May cause an allergy or asthma symptoms or breathing difficulties if inhaled.
H350 - May cause cancer.

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H361 - Suspected of damaging fertility or the unborn child.
H372 - Causes damage to organs through prolonged or repeated exposure.
H400 - Very toxic to aquatic life.
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary Statements (GHS-US/CA) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P284 - [In case of inadequate ventilation] wear respiratory protection.
P301+P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P302+P352 - IF ON SKIN: Wash with plenty of water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P330 - Rinse mouth.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P391 - Collect spillage.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

2.3. Other Hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions. Contains substances that are combustible dusts. If dried and allowed to accumulate, may form combustible dust concentrations in air that could ignite and cause an explosion. Take appropriate precautions. This product is a solid that contains components that are environmentally hazardous and small chips, fine turnings, and dust from processing may be toxic to aquatic life.

Hazards Not Otherwise Classified (HNOC): Reacts violently with water

2.4. Unknown Acute Toxicity (GHS-US/CA)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Synonyms	Product Identifier	% *	GHS Ingredient Classification
Iron	Iron, elemental / Direct reduced Iron / Iron, reduced / Elemental iron / IRON POWDER	(CAS-No.) 7439-89-6	48.72 - 94.05	Comb. Dust
Tungsten carbide	Tungsten carbide (WC) / Tungsten(IV) carbide	(CAS-No.) 12070-12-1	2.8 - 36.86	Comb. Dust
Fatty acids, tall-oil, maleated, esters with	Fatty acids, tall oil, maleated, esters with diethylene glycol, ammonium salt	(CAS-No.) 158706-62-8	15.225 - 33.25	Skin Irrit. 2, H315 Eye Irrit. 2, H319

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diethylene glycol, ammonium salts				
Chromium	Chromium metal / Chromium, elemental / Chromium, metal / Chromium, metallic / Chrome, metal / Chrome	(CAS-No.) 7440-47-3	<= 13.3	Comb. Dust
Cobalt	Cobalt metal / Cobalt, elemental / C.I. 77320 / Cobalt metallic	(CAS-No.) 7440-48-4	0.12 - 9.5	Acute Tox. 4 (Oral), H302 Resp. Sens. 1B, H334 Skin Sens. 1, H317 Carc. 1B, H350 Repr. 2, H361 Aquatic Chronic 4, H413
Nickel	Nickel metal / Nickel, elemental / Nickel, metallic / Nickel, metal / C.I. 77775	(CAS-No.) 7440-02-0	<= 9.5	Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372 Aquatic Acute 1, H400 Aquatic Chronic 3, H412 Comb. Dust
Tantalum carbide (TaC)	Tantalum carbide	(CAS-No.) 12070-06-3	0.2 - 1.9	Not classified
Carbon	Carbon, activated / CARBON / Activated carbon / Carbon Black / Graphite	(CAS-No.) 7440-44-0	<= 1.9	Comb. Dust
Manganese	Manganese, elemental / Manganese metal / Manganese elemental	(CAS-No.) 7439-96-5	<= 1.9	Comb. Dust
Molybdenum	Molybdenum metal / Molybdenum, elemental / Molybdenum, metal / Molybdenum, metallic	(CAS-No.) 7439-98-7	<= 1.9	Comb. Dust
1H-Benzotriazole	1,2,3-Benzotriazole / Benzotriazole / NSC-3058 / 1H-1,2,3-Benzotriazole / BENZOTRIAZOLE / Benzeneazimide / 1,2,3-1H-Benzotriazole	(CAS-No.) 95-14-7	<= 1.9	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:dust,mist), H332 Eye Irrit. 2A, H319 Aquatic Acute 3, H402 Aquatic Chronic 2, H411 Comb. Dust
Vanadium oxide (V2O5)	Vanadium pentoxide / Divanadium pentoxide / Divanadium pentaoxide / Vanadium pentaoxide / Vanadium(V) oxide / C.I. 77938 / Vanadium	(CAS-No.) 1314-62-1	<= 0.95	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation:dust,mist), H332 Eye Dam. 1, H318 Muta. 2, H341 Carc. 2, H351 Repr. 2, H361 STOT SE 3, H335 STOT RE 1, H372 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Sulfur	Sulphur / Sulphur, molten / Elemental sulfur / Brimstone / SULFUR / Elemental sulphur / Sulfur, elemental / Ammonium sulphate	(CAS-No.) 7704-34-9	<= 0.3325	Skin Irrit. 2, H315 Aquatic Acute 3, H402 Aquatic Chronic 3, H412 Comb. Dust
Silicon	Silicon powder / Silicon powder, amorphous / Ammonium hexafluorosilicate	(CAS-No.) 7440-21-3	0.1218 - 0.3325	Flam. Sol. 2, H228 Comb. Dust
Copper	Copper, metallic / Copper metal / Cl 77400 / Granulated copper / Copper (metallic) / Copper, elemental / C.I. Pigment Metal 2 / C.I. 77400 / Pigment Metal 2	(CAS-No.) 7440-50-8	<= 0.3325	Comb. Dust

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Tin	Tin, metal / Tin, elemental / Tin metal	(CAS-No.) 7440-31-5	<= 0.3325	Comb. Dust
Boric acid (H3BO3)	Boric acid / Orthoboric acid / BORIC ACID / Boracic acid	(CAS-No.) 10043-35-3	> 0.3	Repr. 1B, H360
Potassium fluoride	Potassium fluoride (KF) / POTASSIUM FLUORIDE / Potassium fluoride, solid	(CAS-No.) 7789-23-3	> 0.3	Acute Tox. 3 (Oral), H301 Eye Irrit. 2, H319 STOT RE 1, H372
Petroleum distillates, hydrotreated light	Distillates (petroleum), hydrotreated light / Distillates, petroleum, hydrotreated light / Hydrotreated light distillate / Jet fuels / Kerosene, hydrotreated / Petroleum distillates, hydrotreated light (A complex combination of hydrocarbons obtained by treating a petroleum fraction with hydrogen in the presence of a catalyst. It consists of hydrocarbons having carbon numbers predominantly in the range of C9-16 and boiling in the range of approximately 150-290°C.) / Odorless light petroleum hydrocarbons / Hydrocarbons, C11-14, n-alkanes, isoalkanes, cyclics,	(CAS-No.) 64742-47-8	> 0.25	Flam. Liq. 4, H227 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Phosphorus elemental	Phosphorus / Red phosphorus / Phosphorus, red / Phosphorus, amorphous / Phosphorus (amorphous, red) / Phosphorus amorphous / Phosphorus red / Phosphorus (red) / Phosphorus elemental (red) / Phosphorus (red, yellow, white) / Phosphorus (white) / Phosphorus (yellow) / Phosphorous (yellow)	(CAS-No.) 7723-14-0	<= 0.2375	Acute Tox. 1 (Oral), H300 Acute Tox. 2 (Dermal), H310 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Titanium dioxide	C.I. 77891 / C.I. Pigment White 6 / Titanium oxide (TiO2) / CI 77891 / Titanium(IV) oxide / C.I. Pigment White 7 / Pigment White 6 / Titanium dioxide nanoparticles / TITANIUM DIOXIDE / Titanium oxide	(CAS-No.) 13463-67-7	<= 0.2375	Not classified
Tantalum	Tantalum metal / Tantalum, elemental / Tantalum, metal	(CAS-No.) 7440-25-7	<= 0.2375	Not classified
Borate(1-), tetrafluoro-, potassium	Potassium borofluoride / Potassium fluoroborate / Potassium tetrafluoroborate / Borate(1-), tetrafluoro-, potassium (1:1) / Potassium tetrafluoroborate(1-)	(CAS-No.) 14075-53-7	> 0.2	Not classified
Aluminum	Aluminium powder (stabilized) / Aluminium powder / Aluminum (metal) / CI 77000 / C.I. 77000 / Aluminum, metal / Aluminum, elemental / Aluminium metal / Aluminium, metal / Aluminium metal / Aluminium / Aluminium metal, powder / Aluminium powders / Aluminium powder (stabilised) / Pigment Metal 1 / Aluminum powder	(CAS-No.) 7429-90-5	0.00609 - 0.19	Comb. Dust
Aluminum	Aluminium powder (stabilized) / Aluminium powder / Aluminum (metal) / CI 77000 / C.I. 77000 / Aluminum, metal / Aluminum, elemental / Aluminium metal / Aluminium, metal / Aluminium metal / Aluminium / Aluminium metal, powder / Aluminium powders / Aluminium powder (stabilised) / Pigment Metal 1 / Aluminum powder	(CAS-No.) 7429-90-5	> 0.07	Flam. Sol. 1, H228 Water-react. 2, H261 Comb. Dust
Titanium nitride	Titanium nitride (TiN) / BALINIT A	(CAS-No.) 25583-20-4	> 0.01	Not classified

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Full text of H-phrases: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: Using proper respiratory protection, move the exposed person to fresh air at once. Encourage exposed person to cough, spit out, and blow nose to remove dust. Immediately call a poison center, physician, or emergency medical service.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation/rash develops or persists. If exposed or concerned: Get medical advice/attention.

Eye Contact: Remove contact lenses, if present and easy to do. Continue rinsing. Rinse cautiously with water for at least 15 minutes. Obtain medical attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: The health effects listed below are not likely to occur unless dust or fumes are generated by processing. Harmful if swallowed. Skin sensitization. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes skin irritation. Causes serious eye irritation. May cause cancer. (inhalation). Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Final product may have sharp edges.

Inhalation: May cause cancer by inhalation. Exposure may produce cough, mucous secretions, shortness of breath, chest tightness or other symptoms indicative of an allergic/sensitization reaction. Inhalation of dust may cause pulmonary fibrosis. Dust may be harmful or cause irritation.

Skin Contact: May cause an allergic skin reaction. Contact with hot, molten metal will cause thermal burns. Mechanical damage via flying particles and chipped slag is possible. Causes skin irritation. Nickel: May cause a form of dermatitis known as nickel itch and intestinal irritation, which may cause disorders, convulsions and asphyxia.

Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Contact causes severe irritation with redness and swelling of the conjunctiva. Causes serious eye irritation.

Ingestion: This material is harmful orally and can cause adverse health effects or death in significant amounts.

Chronic Symptoms: May cause damage to organs through prolonged or repeated exposure. May cause cancer (inhalation). Suspected of damaging fertility or the unborn child. Repeated inhalation of iron oxide dust can cause siderosis a benign condition. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Chronic exposure to cobalt-containing hard metal (dust or fume) can result in a serious lung disease called "hard metal lung disease", which is a type of pneumoconiosis (lung fibrosis). Nickel: May cause a form of dermatitis known as nickel itch and intestinal irritation, which may cause disorders, convulsions and asphyxia. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Chronic exposure to excessive manganese levels can lead to a variety of psychiatric and motor disturbances, termed manganism. Molybdenum: Chronic exposure to molybdenum compounds is suspected of causing cancer. Compounds are also known to cause irritation to the skin, eyes, and respiratory tract. Vanadium: May cause gastrointestinal discomfort, renal damage, nervous system depression and irritation of the respiratory passages. May also cause cardiac palpitations and asthma. Silicon: Can cause chronic bronchitis and narrowing of the airways. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Tin: Has been shown to increase incidence of sarcoma in animal tests. Chronic exposure to tin dusts and fume may result in "stannosis", a mild form of pneumoconiosis. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

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SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use Class D extinguishing agents on dusts, fines or molten metal. Use coarse water spray on chips and turnings.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Metallic dusts may ignite or explode. Combustible Dust.

Explosion Hazard: Dust explosion hazard in air. If excessive dust is generated from processing, it may present a dust explosion hazard when dispersed in air at sufficient quantities in the presence of an ignition source.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Metal oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses. Risk of dust explosion.

5.4. Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid generating dust. For particulates and dust: Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Remove ignition sources.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. Avoid generation of dust during clean-up of spills.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Use explosion proof vacuum during cleanup, with appropriate filter. Do not mix with other materials. Vacuum clean-up is preferred. If sweeping is required use a dust suppressant. Use only non-sparking tools. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: This product is physiologically inert in its massive form. However, user-generated dust and/or fumes may pose a physiological hazard if inhaled or ingested. Avoid inhalation of metal dusts and fumes. May cause an influenza-like illness. Avoid skin and eye contact with dusts to prevent mechanical irritation. User-generated dust is easily ignited and difficult to extinguish. Accumulation and dispersion of dust with an ignition source can cause a combustible dust explosion. Keep dust levels to a minimum and follow applicable regulations.

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Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid creating or spreading dust. Do not breathe dust, particulates, or vapor. Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Handle empty containers with care because they may still present a hazard. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Avoid creating or spreading dust. Use explosion-proof electrical, ventilating, lighting equipment. Proper grounding procedures to avoid static electricity should be followed.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store locked up/in a secure area.

Incompatible Materials: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

Cutting Tools for Manufacturing Industries.-----NA ONLY-----When used as intended, this product is physiologically inert. Do not modify or resharpen product; return tools to Harvey Tool Company for alteration.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), or Canadian provincial governments.

Tungsten, insoluble compounds		
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	5 mg/m ³
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	10 mg/m ³
Alberta	OEL STEL (mg/m ³)	10 mg/m ³
Alberta	OEL TWA (mg/m ³)	5 mg/m ³
British Columbia	OEL STEL (mg/m ³)	10 mg/m ³
British Columbia	OEL TWA (mg/m ³)	5 mg/m ³
New Brunswick	OEL STEL (mg/m ³)	10 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	5 mg/m ³
Nunavut	OEL STEL (mg/m ³)	10 mg/m ³
Nunavut	OEL TWA (mg/m ³)	5 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	10 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	5 mg/m ³
Ontario	OEL STEL (mg/m ³)	10 mg/m ³
Ontario	OEL TWA (mg/m ³)	5 mg/m ³
Québec	VECD (mg/m ³)	10 mg/m ³
Québec	VEMP (mg/m ³)	5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	10 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	5 mg/m ³
Yukon	OEL STEL (mg/m ³)	10 mg/m ³
Yukon	OEL TWA (mg/m ³)	5 mg/m ³
Tungsten compounds		
USA ACGIH	ACGIH TWA (mg/m ³)	3 mg/m ³ (in the absence of cobalt-respirable particulate matter)
Manitoba	OEL TWA (mg/m ³)	3 mg/m ³ (in the absence of Cobalt-respirable particulate matter)
Newfoundland & Labrador	OEL TWA (mg/m ³)	3 mg/m ³ (in the absence of Cobalt-respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	3 mg/m ³ (in the absence of Cobalt-respirable particulate matter)

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Prince Edward Island	OEL TWA (mg/m ³)	3 mg/m ³ (in the absence of Cobalt-respirable particulate matter)
Manganese (7439-96-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	5 mg/m ³ (fume)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (fume)
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	3 mg/m ³
USA IDLH	US IDLH (mg/m ³)	500 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.2 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.2 mg/m ³ (total) 0.02 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	0.2 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	0.6 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	0.2 mg/m ³ (total dust and fume)
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³
Yukon	OEL Ceiling (mg/m ³)	5 mg/m ³
Phosphorus elemental (7723-14-0)		
Alberta	OEL TWA (mg/m ³)	0.1 mg/m ³ (yellow)
New Brunswick	OEL TWA (mg/m ³)	0.1 mg/m ³ (yellow)
New Brunswick	OEL TWA (ppm)	0.02 ppm (yellow)
Québec	VEMP (mg/m ³)	0.1 mg/m ³ (yellow)
Sulfur (7704-34-9)		
Alberta	OEL TWA (mg/m ³)	10 mg/m ³
Silicon (7440-21-3)		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
British Columbia	OEL TWA (mg/m ³)	10 mg/m ³ (total dust) 3 mg/m ³ (respirable fraction)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³

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Québec	VEMP (mg/m ³)	10 mg/m ³ (containing no Asbestos and <1% Crystalline silica-total dust)
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³
Yukon	OEL STEL (mg/m ³)	20 mg/m ³
Yukon	OEL TWA (mg/m ³)	30 mppcf 10 mg/m ³
Nickel (7440-02-0)		
USA ACGIH	ACGIH TWA (mg/m ³)	1.5 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Not Suspected as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.015 mg/m ³
USA IDLH	US IDLH (mg/m ³)	10 mg/m ³
Alberta	OEL TWA (mg/m ³)	1.5 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.05 mg/m ³
Manitoba	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	1 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	3 mg/m ³ (inhalable fraction)
Nunavut	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable fraction)
Northwest Territories	OEL STEL (mg/m ³)	3 mg/m ³ (inhalable fraction)
Northwest Territories	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable fraction)
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (inhalable)
Prince Edward Island	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	1 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	3 mg/m ³ (inhalable fraction)
Saskatchewan	OEL TWA (mg/m ³)	1.5 mg/m ³ (inhalable fraction)
Yukon	OEL STEL (mg/m ³)	3 mg/m ³
Yukon	OEL TWA (mg/m ³)	1 mg/m ³
Chromium (7440-47-3)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (inhalable particulate matter)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.5 mg/m ³
USA IDLH	US IDLH (mg/m ³)	250 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.5 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.5 mg/m ³ (total)
Manitoba	OEL TWA (mg/m ³)	0.5 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	0.5 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.5 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.5 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	1.5 mg/m ³ (metal)
Nunavut	OEL TWA (mg/m ³)	0.5 mg/m ³ (metal)
Northwest Territories	OEL STEL (mg/m ³)	1.5 mg/m ³ (metal)
Northwest Territories	OEL TWA (mg/m ³)	0.5 mg/m ³ (metal)
Ontario	OEL TWA (mg/m ³)	0.5 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.5 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	0.5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	1.5 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.5 mg/m ³

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Yukon	OEL STEL (mg/m ³)	3 mg/m ³
Yukon	OEL TWA (mg/m ³)	0.1 mg/m ³
Molybdenum (7439-98-7)		
	Internal TWA (mg/m ³)	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds)
USA ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds) 15 mg/m ³ (Molybdenum (as Mo), Insoluble Compounds (Total dust))
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds)
USA IDLH	US IDLH (mg/m ³)	5000 mg/m ³
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (total) 3 mg/m ³ (respirable)
British Columbia	OEL TWA (mg/m ³)	3 mg/m ³ (respirable) 10 mg/m ³ (inhalable)
Manitoba	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Newfoundland & Labrador	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (metal-inhalable fraction) 6 mg/m ³ (metal-respirable fraction)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (metal-inhalable fraction) 3 mg/m ³ (metal-respirable fraction)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (metal-inhalable fraction) 6 mg/m ³ (metal-respirable fraction)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (metal-inhalable fraction) 3 mg/m ³ (metal-respirable fraction)
Ontario	OEL TWA (mg/m ³)	10 mg/m ³ (metal-inhalable) 3 mg/m ³ (metal-respirable)
Prince Edward Island	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (inhalable fraction) 6 mg/m ³ (respirable fraction)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 3 mg/m ³ (respirable fraction)
Copper (7440-50-8)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³ (fume)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (dust and mist) 0.1 mg/m ³ (fume)
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³ (dust, fume and mist)
Alberta	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist) 0.2 mg/m ³ (fume)
Manitoba	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
New Brunswick	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)

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Newfoundland & Labrador	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Nova Scotia	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Nunavut	OEL STEL (mg/m ³)	3 mg/m ³ (dust and mist) 0.6 mg/m ³ (fume)
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Northwest Territories	OEL STEL (mg/m ³)	3 mg/m ³ (dust and mist) 0.6 mg/m ³ (fume)
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Prince Edward Island	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Québec	VEMP (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³ (fume) 3 mg/m ³ (dust and mist)
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Yukon	OEL STEL (mg/m ³)	0.2 mg/m ³ (fume) 2 mg/m ³ (dust and mist)
Yukon	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Tin (7440-31-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	2 mg/m ³
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³
Alberta	OEL TWA (mg/m ³)	2 mg/m ³
British Columbia	OEL TWA (mg/m ³)	2 mg/m ³
Manitoba	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	2 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	4 mg/m ³ (metal)
Nunavut	OEL TWA (mg/m ³)	2 mg/m ³ (metal)
Northwest Territories	OEL STEL (mg/m ³)	4 mg/m ³ (metal)
Northwest Territories	OEL TWA (mg/m ³)	2 mg/m ³ (metal)
Ontario	OEL TWA (mg/m ³)	2 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	2 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	4 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	2 mg/m ³
Vanadium oxide (V2O5) (1314-62-1)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.05 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	0.05 mg/m ³ (dust and fume)
USA IDLH	US IDLH (mg/m ³)	35 mg/m ³ (dust and fume)
Alberta	OEL TWA (mg/m ³)	0.05 mg/m ³ (fume or respirable particulate)
British Columbia	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable)

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Manitoba	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	0.05 mg/m ³ (respirable dust or fume)
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	0.15 mg/m ³ (dust and fume; respirable fraction)
Nunavut	OEL TWA (mg/m ³)	0.05 mg/m ³ (dust and fume; respirable fraction)
Northwest Territories	OEL STEL (mg/m ³)	0.15 mg/m ³ (dust and fume; respirable fraction)
Northwest Territories	OEL TWA (mg/m ³)	0.05 mg/m ³ (dust and fume; respirable fraction)
Ontario	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable)
Prince Edward Island	OEL TWA (mg/m ³)	0.05 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	0.05 mg/m ³ (fume and respirable dust)
Saskatchewan	OEL STEL (mg/m ³)	0.15 mg/m ³ (dust and fume, respirable fraction)
Saskatchewan	OEL TWA (mg/m ³)	0.05 mg/m ³ (dust and fume, respirable fraction)
Yukon	OEL Ceiling (mg/m ³)	0.05 mg/m ³ (fume)
Yukon	OEL STEL (mg/m ³)	1.5 mg/m ³ (dust)
Yukon	OEL TWA (mg/m ³)	0.5 mg/m ³ (dust)
Aluminum (7429-90-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³ (metal dust)
Newfoundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Québec	VEMP (mg/m ³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (dust)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
Titanium dioxide (13463-67-7)		
USA ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	2.4 mg/m ³ (CIB 63-fine) 0.3 mg/m ³ (CIB 63-ultrafine, including engineered nanoscale)
USA IDLH	US IDLH (mg/m ³)	5000 mg/m ³
Alberta	OEL TWA (mg/m ³)	10 mg/m ³
British Columbia	OEL TWA (mg/m ³)	10 mg/m ³ (total dust) 3 mg/m ³ (respirable fraction)
Manitoba	OEL TWA (mg/m ³)	10 mg/m ³

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New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	10 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	10 mg/m ³
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³
Ontario	OEL TWA (mg/m ³)	10 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	10 mg/m ³
Québec	VEMP (mg/m ³)	10 mg/m ³ (containing no Asbestos and <1% Crystalline silica-total dust)
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³
Yukon	OEL STEL (mg/m ³)	20 mg/m ³
Yukon	OEL TWA (mg/m ³)	30 mppcf 10 mg/m ³
Tantalum (7440-25-7)		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	5 mg/m ³ (dust)
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	10 mg/m ³ (dust)
USA IDLH	US IDLH (mg/m ³)	2500 mg/m ³ (dust)
Alberta	OEL TWA (mg/m ³)	5 mg/m ³ (dust)
British Columbia	OEL TWA (mg/m ³)	5 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	5 mg/m ³ (dust)
Nunavut	OEL STEL (mg/m ³)	10 mg/m ³ (metal)
Nunavut	OEL TWA (mg/m ³)	5 mg/m ³ (metal)
Northwest Territories	OEL STEL (mg/m ³)	10 mg/m ³ (metal)
Northwest Territories	OEL TWA (mg/m ³)	5 mg/m ³ (metal)
Québec	VEMP (mg/m ³)	5 mg/m ³ (dust)
Saskatchewan	OEL STEL (mg/m ³)	10 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	5 mg/m ³
Yukon	OEL STEL (mg/m ³)	10 mg/m ³
Yukon	OEL TWA (mg/m ³)	5 mg/m ³
Tin inorganic compounds		
USA ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (excluding tin hydride and indium tin oxide-inhalable particulate matter)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	2 mg/m ³ (except oxides)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	2 mg/m ³ (except Tin oxides)
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³ (except Tin oxides)
Alberta	OEL TWA (mg/m ³)	2 mg/m ³ (except Tin hydride)
British Columbia	OEL TWA (mg/m ³)	2 mg/m ³ (except Tin hydride)
Manitoba	OEL TWA (mg/m ³)	2 mg/m ³ (excluding Tin hydride and Indium tin oxide-inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	2 mg/m ³ (except SnH4)
Newfoundland & Labrador	OEL TWA (mg/m ³)	2 mg/m ³ (excluding Tin hydride and Indium tin oxide-inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	2 mg/m ³ (excluding Tin hydride and Indium tin oxide-inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	4 mg/m ³ (except SnH4)
Nunavut	OEL TWA (mg/m ³)	2 mg/m ³ (except SnH4)

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Northwest Territories	OEL STEL (mg/m ³)	4 mg/m ³ (except SnH4)
Northwest Territories	OEL TWA (mg/m ³)	2 mg/m ³ (except SnH4)
Ontario	OEL TWA (mg/m ³)	2 mg/m ³ (except Tin hydride)
Prince Edward Island	OEL TWA (mg/m ³)	2 mg/m ³ (excluding Tin hydride and Indium tin oxide-inhalable particulate matter)
Québec	VEMP (mg/m ³)	2 mg/m ³ (except SnH4)
Saskatchewan	OEL STEL (mg/m ³)	4 mg/m ³ (except SnH4)
Saskatchewan	OEL TWA (mg/m ³)	2 mg/m ³ (except SnH4)
Yukon	OEL STEL (mg/m ³)	4 mg/m ³ (except SnH4 and SnO3)
Yukon	OEL TWA (mg/m ³)	2 mg/m ³ (except SnH4 and SnO3)
Copper compounds		
USA ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (dust and mist)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (dust and mist)
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³ (dust and mist)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist)
Newfoundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist)
Manganese compounds		
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	5 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	3 mg/m ³
USA IDLH	US IDLH (mg/m ³)	500 mg/m ³
Québec	VEMP (mg/m ³)	0.2 mg/m ³ (total dust and fume)
Yukon	OEL Ceiling (mg/m ³)	5 mg/m ³
Manganese inorganic compounds		
USA ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
Alberta	OEL TWA (mg/m ³)	0.2 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.2 mg/m ³ (total) 0.02 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	0.2 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Nunavut	OEL STEL (mg/m ³)	0.6 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable) 0.1 mg/m ³ (inhalable)
Prince Edward Island	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable particulate matter) 0.1 mg/m ³ (inhalable particulate matter)
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³
Nickel compounds		

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USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.015 mg/m ³ (except Nickel carbonyl)
USA IDLH	US IDLH (mg/m ³)	10 mg/m ³ (except Nickel carbonyl)
Molybdenum insoluble compounds		
USA ACGIH	ACGIH TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust)
USA IDLH	US IDLH (mg/m ³)	5000 mg/m ³
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (total) 3 mg/m ³ (respirable)
British Columbia	OEL TWA (mg/m ³)	3 mg/m ³ (respirable) 10 mg/m ³ (inhalable)
Manitoba	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (inhalable fraction) 6 mg/m ³ (respirable fraction)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 3 mg/m ³ (respirable fraction)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (inhalable fraction) 6 mg/m ³ (respirable fraction)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 3 mg/m ³ (respirable fraction)
Ontario	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable) 3 mg/m ³ (respirable)
Prince Edward Island	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
Québec	VEMP (mg/m ³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (inhalable fraction) 6 mg/m ³ (respirable fraction)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 3 mg/m ³ (respirable fraction)
Yukon	OEL STEL (mg/m ³)	20 mg/m ³
Yukon	OEL TWA (mg/m ³)	10 mg/m ³
Vanadium compounds		
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	0.05 mg/m ³ (except Vanadium metal and Vanadium carbide-dust and fume)
Boric acid (H3BO3) (10043-35-3)		
USA ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
USA ACGIH	ACGIH STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
British Columbia	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable (Borate compounds, inorganic))
British Columbia	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable (Borate compounds, inorganic))
Manitoba	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))

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Manitoba	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Newfoundland & Labrador	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Newfoundland & Labrador	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Nova Scotia	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Nova Scotia	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Nunavut	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Nunavut	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Northwest Territories	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Northwest Territories	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Ontario	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable (Borate compounds, inorganic))
Ontario	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable (Borate compounds, inorganic))
Prince Edward Island	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Prince Edward Island	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter (Borate compounds, inorganic))
Saskatchewan	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Saskatchewan	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable fraction (Borate compounds, inorganic))
Petroleum distillates, hydrotreated light (64742-47-8)		
British Columbia	OEL TWA (mg/m ³)	200 mg/m ³ (application restricted to conditions in which there are negligible aerosol exposures)
Borate compounds, inorganic		
USA ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
British Columbia	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable)
British Columbia	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable)
Manitoba	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter)
Manitoba	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Newfoundland & Labrador	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter)
Newfoundland & Labrador	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Prince Edward Island	OEL STEL (mg/m ³)	6 mg/m ³ (inhalable particulate matter)
Prince Edward Island	OEL TWA (mg/m ³)	2 mg/m ³ (inhalable particulate matter)
Fluorides, inorganic		
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	2.5 mg/m ³ (Sodium fluoride)
Fluorides		
USA ACGIH	ACGIH TWA (mg/m ³)	2.5 mg/m ³
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA ACGIH	Biological Exposure Indices (BEI)	2 mg/l Parameter: Fluoride - Medium: urine - Sampling time: prior to shift (background, nonspecific) 3 mg/l Parameter: Fluoride - Medium: urine - Sampling time: end of shift (background, nonspecific)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	2.5 mg/m ³
USA IDLH	US IDLH (mg/m ³)	250 mg/m ³

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Alberta	OEL TWA (mg/m ³)	2.5 mg/m ³
British Columbia	OEL TWA (mg/m ³)	2.5 mg/m ³
Manitoba	OEL TWA (mg/m ³)	2.5 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	2.5 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	2.5 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	2.5 mg/m ³
Ontario	OEL TWA (mg/m ³)	2.5 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	2.5 mg/m ³
Québec	VEMP (mg/m ³)	2.5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	5 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	2.5 mg/m ³
Yukon	OEL STEL (mg/m ³)	2.5 mg/m ³
Yukon	OEL TWA (mg/m ³)	2.5 mg/m ³
Aluminum (7429-90-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³ (metal dust)
Newfoundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Québec	VEMP (mg/m ³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (dust)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
Cobalt (7440-48-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	dermal sensitizer, Confirmed Animal Carcinogen with Unknown Relevance to Humans
USA ACGIH	Biological Exposure Indices (BEI)	15 µg/l Parameter: Cobalt - Medium: urine - Sampling time: end of shift at end of workweek (nonspecific)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³ (dust and fume)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.05 mg/m ³ (dust and fume)
USA IDLH	US IDLH (mg/m ³)	20 mg/m ³ (dust and fume)
Alberta	OEL TWA (mg/m ³)	0.02 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.02 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.02 mg/m ³ (inhalable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	0.02 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.02 mg/m ³ (inhalable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.02 mg/m ³ (inhalable particulate matter)

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Nunavut	OEL STEL (mg/m ³)	0.06 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.02 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.06 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.02 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.02 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.02 mg/m ³ (inhalable particulate matter)
Québec	VEMP (mg/m ³)	0.02 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	0.06 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.02 mg/m ³
Yukon	OEL STEL (mg/m ³)	0.15 mg/m ³ (dust and fume)
Yukon	OEL TWA (mg/m ³)	0.05 mg/m ³ (dust and fume)

8.2. Exposure Controls

Appropriate Engineering Controls: Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. It is recommended that all 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. Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits. Power equipment should be equipped with proper dust collection devices. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear protective gloves.

Eye and Face Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Grey, Grey With Dark Grey Coat
Odor	: Odorless
Odor Threshold	: Not available
pH	: Not available
Evaporation Rate	: Not available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: Not available
Flash Point	: Not available
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: Not available
Relative Vapor Density at 20°C	: Not available

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Relative Density	: Not available
Density	: 15.7g/cm ³
Specific Gravity	: Not available
Solubility	: Insoluble
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: Not available

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Direct sunlight, extremely high or low temperatures, and incompatible materials. Sparks, heat, open flame and other sources of ignition. Dust accumulation (to minimize explosion hazard).
- 10.5. Incompatible Materials:** Strong acids, strong bases, strong oxidizers.
- 10.6. Hazardous Decomposition Products:** Not expected to decompose under ambient conditions. Thermal decomposition may produce : Metal oxides. Toxic fumes.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity (Oral): Harmful if swallowed.

Acute Toxicity (Dermal): Not classified

Acute Toxicity (Inhalation): Not classified

LD50 and LC50 Data:

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ATE US/CA (oral)	764.84 mg/kg body weight

Skin Corrosion/Irritation: Causes skin irritation.

Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: May cause an allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer.

Specific Target Organ Toxicity (Repeated Exposure): Causes damage to organs through prolonged or repeated exposure.

Reproductive Toxicity: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause cancer by inhalation. Exposure may produce cough, mucous secretions, shortness of breath, chest tightness or other symptoms indicative of an allergic/sensitization reaction. Inhalation of dust may cause pulmonary fibrosis. Dust may be harmful or cause irritation.

Symptoms/Injuries After Skin Contact: May cause an allergic skin reaction. Contact with hot, molten metal will cause thermal burns. Mechanical damage via flying particles and chipped slag is possible. Causes skin irritation. Nickel: May cause a form of dermatitis known as nickel itch and intestinal irritation, which may cause disorders, convulsions and asphyxia.

Symptoms/Injuries After Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. . Contact causes severe irritation with redness and swelling of the conjunctiva. Causes serious eye irritation.

Symptoms/Injuries After Ingestion: This material is harmful orally and can cause adverse health effects or death in significant amounts.

Chronic Symptoms: May cause damage to organs through prolonged or repeated exposure. May cause cancer (inhalation). Suspected of damaging fertility or the unborn child. Repeated inhalation of iron oxide dust can cause siderosis a benign condition. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Chronic exposure to cobalt-containing hard metal (dust or fume) can

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result in a serious lung disease called "hard metal lung disease", which is a type of pneumoconiosis (lung fibrosis). Nickel: May cause a form of dermatitis known as nickel itch and intestinal irritation, which may cause disorders, convulsions and asphyxia. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Chronic exposure to excessive manganese levels can lead to a variety of psychiatric and motor disturbances, termed manganism. Molybdenum: Chronic exposure to molybdenum compounds is suspected of causing cancer. Compounds are also known to cause irritation to the skin, eyes, and respiratory tract. Vanadium: May cause gastrointestinal discomfort, renal damage, nervous system depression and irritation of the respiratory passages. May also cause cardiac palpitations and asthma. Silicon: Can cause chronic bronchitis and narrowing of the airways. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Tin: Has been shown to increase incidence of sarcoma in animal tests. Chronic exposure to tin dusts and fume may result in "stannosis", a mild form of pneumoconiosis. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Iron (7439-89-6)	
LD50 Oral Rat	98.6 g/kg
Carbon (7440-44-0)	
LD50 Oral Rat	> 10000 mg/kg
Manganese (7439-96-5)	
LD50 Oral Rat	> 2000 mg/kg
LC50 Inhalation Rat	> 5.14 mg/l/4h
Phosphorus elemental (7723-14-0)	
LD50 Oral Rat	3030 µg/kg
LD50 Dermal Rat	100 mg/kg
LC50 Inhalation Rat	4.3 mg/l (Exposure time: 1 h)
Sulfur (7704-34-9)	
LD50 Oral Rat	> 3000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	> 9.23 mg/l/4h
Silicon (7440-21-3)	
LD50 Oral Rat	3160 mg/kg
Nickel (7440-02-0)	
LD50 Oral Rat	> 9000 mg/kg
LC50 Inhalation Rat	> 10.2 mg/l (Exposure time: 1 h)
Chromium (7440-47-3)	
LD50 Oral Rat	> 5000 mg/kg
LC50 Inhalation Rat	> 5.41 mg/l/4h
Molybdenum (7439-98-7)	
LD50 Oral Rat	> 2000 mg/kg
LD50 Dermal Rat	> 2000 mg/kg
LC50 Inhalation Rat	> 3.92 mg/l/4h
Vanadium oxide (V2O5) (1314-62-1)	
LD50 Oral Rat	200 - 2000 mg/kg (Species: Sprague-Dawley)
LD50 Dermal Rat	> 2500 mg/kg body weight
LC50 Inhalation Rat	4.29 mg/l/4h
Titanium dioxide (13463-67-7)	
LD50 Oral Rat	> 10000 mg/kg
Tantalum (7440-25-7)	
LD50 Oral Rat	> 2000 mg/kg

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LD50 Dermal Rat	> 2000 mg/kg
1H-Benzotriazole (95-14-7)	
LD50 Oral Rat	560 mg/kg
LD50 Dermal Rabbit	> 10000 mg/kg
LC50 Inhalation Rat	1910 mg/m ³ (Exposure time: 3 h)
LC50 Inhalation Rat	1.43 mg/l/4h
Boric acid (H3BO3) (10043-35-3)	
LD50 Oral Rat	2660 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
Petroleum distillates, hydrotreated light (64742-47-8)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	> 5.2 mg/l/4h No deaths resulted. At necropsy, no significant effects were found in the lungs.
Borate(1-), tetrafluoro-, potassium (14075-53-7)	
LD50 Oral Rat	5854 mg/kg
Potassium fluoride (7789-23-3)	
LD50 Oral Rat	245 mg/kg
LC50 Inhalation Rat	1 mg/l/4h
Cobalt (7440-48-4)	
LD50 Oral Rat	215.9 - 1140 mg/kg
LC50 Inhalation Rat	> 10 mg/l (Exposure time: 1 h)
LC50 Inhalation Rat	< 0.05 mg/l/4h
Cobalt compounds	
IARC Group	2B
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Nickel (7440-02-0)	
IARC Group	2B
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Chromium (7440-47-3)	
IARC Group	3
Vanadium oxide (V2O5) (1314-62-1)	
IARC Group	2B
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Titanium dioxide (13463-67-7)	
IARC Group	2B
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Nickel compounds	
IARC Group	1
National Toxicology Program (NTP) Status	Known Human Carcinogens.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Fluorides, inorganic	
IARC Group	3
Cobalt (7440-48-4)	
IARC Group	2B

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National Toxicology Program (NTP) Status	Evidence of Carcinogenicity, Reasonably anticipated to be Human Carcinogen.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

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

Manganese (7439-96-5)	
LC50 Fish 1	> 3.6 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [semi-static])
NOEC Chronic Fish	3.6 mg/l (Exposure time: 96h; Species: Oncorhynchus mykiss)
Phosphorus elemental (7723-14-0)	
LC50 Fish 1	33.2 mg/l Red Phosphorous (Exposure time: 96 h - Species Danio rerio [static])
EC50 Daphnia 1	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 Fish 2	0.001 - 0.004 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 2	0.025 - 0.037 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
Sulfur (7704-34-9)	
LC50 Fish 1	866 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
EC50 Daphnia 1	736 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 Fish 2	14 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
Nickel (7440-02-0)	
LC50 Fish 1	100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
EC50 Daphnia 1	100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 Fish 2	15.3 mg/l
EC50 Daphnia 2	1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
Vanadium oxide (V2O5) (1314-62-1)	
LC50 Fish 1	4.46 mg/l
NOEC Chronic Fish	0.073 mg/l
1H-Benzotriazole (95-14-7)	
LC50 Fish 1	39 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	141.6 mg/l (Exposure time: 48 h - Species: water flea)
Boric acid (H3BO3) (10043-35-3)	
LC50 Fish 1	447 mg/l
EC50 Daphnia 1	115 - 153 mg/l (Exposure time: 48 h - Species: Daphnia magna)
ErC50 (algae)	290 mg/l
NOEC Chronic Fish	2.1 mg/l
Petroleum distillates, hydrotreated light (64742-47-8)	
LC50 Fish 1	45 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
LC50 Fish 2	2.2 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
Potassium fluoride (7789-23-3)	
LC50 Fish 1	9.3 mg/l (Exposure time: 96 h - Species: Ctenopharyngodon idella)
Cobalt (7440-48-4)	
LC50 Fish 1	> 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
12.2. Persistence and Degradability	
Copper (7440-50-8)	
Persistence and Degradability	Not readily biodegradable.
12.3. Bioaccumulative Potential	
Phosphorus elemental (7723-14-0)	
BCF Fish 1	< 200

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Boric acid (H3BO3) (10043-35-3)	
BCF Fish 1	0
Log Pow	-0.757 (at 25 °C)
Petroleum distillates, hydrotreated light (64742-47-8)	
BCF Fish 1	61 - 159
Cobalt (7440-48-4)	
BCF Fish 1	(no bioaccumulation)

12.4. Mobility in Soil Not available

12.5. Other Adverse Effects Not available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

14.1. In Accordance with DOT Not regulated for transport

14.2. In Accordance with IMDG Not regulated for transport

14.3. In Accordance with IATA Not regulated for transport

14.4. In Accordance with TDG Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

CEMENTED TUNGSTEN CARBIDE CUTTING TOOLS; UNCOATED OR ALTIN COATED; SDS GROUP 12	
SARA Section 311/312 Hazard Classes	Health hazard - Acute toxicity (any route of exposure) Health hazard - Serious eye damage or eye irritation Health hazard - Skin corrosion or Irritation Health hazard - Respiratory or skin sensitization Health hazard - Carcinogenicity Health hazard - Reproductive toxicity Health hazard - Specific target organ toxicity (single or repeated exposure)
Tungsten carbide (12070-12-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Tantalum carbide (TaC) (12070-06-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Carbon (7440-44-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Manganese (7439-96-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %
Phosphorus elemental (7723-14-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Subject to reporting requirements of United States SARA Section 313	

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CERCLA RQ	1 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	100 lb (this material is a reactive solid, the TPQ does not default to 10000 pounds for non-powder, non-molten, non-solution form)
SARA Section 313 - Emission Reporting	1 % (yellow or white)
Sulfur (7704-34-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Silicon (7440-21-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Nickel (7440-02-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	100 lb (only applicable if particles are < 100 µm)
SARA Section 313 - Emission Reporting	0.1 %
Chromium (7440-47-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm
SARA Section 313 - Emission Reporting	1 %
Molybdenum (7439-98-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Copper (7440-50-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm
SARA Section 313 - Emission Reporting	1 %
Tin (7440-31-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Vanadium oxide (V2O5) (1314-62-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302	
CERCLA RQ	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	100 - 10000 lb
Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (dust or fume only)
Titanium dioxide (13463-67-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Tantalum (7440-25-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Fatty acids, tall-oil, maleated, esters with diethylene glycol, ammonium salts (158706-62-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	PMN - PMN - indicates a commenced PMN substance.
1H-Benzotriazole (95-14-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

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EPA TSCA Regulatory Flag	TP - TP - indicates a substance that is the subject of a proposed Section 4 test rule under TSCA.
Copper compounds	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (This category does not include CAS numbers 147-14-8, 1328-53-6, or 14302-13-7, or copper phthalocyanine compounds that are substituted with only hydrogen and/or chlorine and/or bromine.)
Manganese compounds	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %
Nickel compounds	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %
Vanadium compounds	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %
Boric acid (H3BO3) (10043-35-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Petroleum distillates, hydrotreated light (64742-47-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Borate(1-), tetrafluoro-, potassium (14075-53-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Potassium fluoride (7789-23-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Titanium nitride (25583-20-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (dust or fume only)
Cobalt (7440-48-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %

15.2. US State Regulations

California Proposition 65



WARNING: This product can expose you to Cobalt, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Chemical Name (CAS No.)	Carcinogenicity	Developmental Toxicity	Female Reproductive Toxicity	Male Reproductive Toxicity
Nickel (7440-02-0)	X			
Vanadium oxide (V2O5) (1314-62-1)	X			
Titanium dioxide (13463-67-7)	X			
Nickel compounds	X			
Cobalt (7440-48-4)	X			

Tungsten carbide (12070-12-1)

U.S. - New Jersey - Right to Know Hazardous Substance List

Cobalt compounds

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U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Manganese (7439-96-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Phosphorus elemental (7723-14-0)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Sulfur (7704-34-9)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Silicon (7440-21-3)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Nickel (7440-02-0)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) List

Chromium (7440-47-3)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) List

Molybdenum (7439-98-7)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Copper (7440-50-8)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Tin (7440-31-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Vanadium oxide (V2O5) (1314-62-1)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List

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

Aluminum (7429-90-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Titanium dioxide (13463-67-7)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Tantalum (7440-25-7)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

1H-Benzotriazole (95-14-7)

U.S. - Massachusetts - Right To Know List

Copper compounds

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Manganese compounds

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Nickel compounds

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Chromium compounds

U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Vanadium compounds

U.S. - New Jersey - Right to Know Hazardous Substance List

Potassium fluoride (7789-23-3)

U.S. - New Jersey - Right to Know Hazardous Substance List

Borate compounds, inorganic

U.S. - New Jersey - Right to Know Hazardous Substance List

Fluorides

U.S. - New Jersey - Right to Know Hazardous Substance List

Aluminum (7429-90-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Cobalt (7440-48-4)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List

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

15.3. Canadian Regulations

Tungsten carbide (12070-12-1)

Listed on the Canadian DSL (Domestic Substances List)

Tantalum carbide (TaC) (12070-06-3)

Listed on the Canadian DSL (Domestic Substances List)

Iron (7439-89-6)

Listed on the Canadian DSL (Domestic Substances List)

Carbon (7440-44-0)

Listed on the Canadian DSL (Domestic Substances List)

Manganese (7439-96-5)

Listed on the Canadian DSL (Domestic Substances List)

Phosphorus elemental (7723-14-0)

Listed on the Canadian DSL (Domestic Substances List)

Sulfur (7704-34-9)

Listed on the Canadian DSL (Domestic Substances List)

Silicon (7440-21-3)

Listed on the Canadian DSL (Domestic Substances List)

Nickel (7440-02-0)

Listed on the Canadian DSL (Domestic Substances List)

Chromium (7440-47-3)

Listed on the Canadian DSL (Domestic Substances List)

Molybdenum (7439-98-7)

Listed on the Canadian DSL (Domestic Substances List)

Copper (7440-50-8)

Listed on the Canadian DSL (Domestic Substances List)

Tin (7440-31-5)

Listed on the Canadian DSL (Domestic Substances List)

Vanadium oxide (V2O5) (1314-62-1)

Listed on the Canadian DSL (Domestic Substances List)

Aluminum (7429-90-5)

Listed on the Canadian DSL (Domestic Substances List)

Titanium dioxide (13463-67-7)

Listed on the Canadian DSL (Domestic Substances List)

Tantalum (7440-25-7)

Listed on the Canadian DSL (Domestic Substances List)

Fatty acids, tall-oil, maleated, esters with diethylene glycol, ammonium salts (158706-62-8)

Listed on the Canadian DSL (Domestic Substances List)

1H-Benzotriazole (95-14-7)

Listed on the Canadian DSL (Domestic Substances List)

Boric acid (H3BO3) (10043-35-3)

Listed on the Canadian DSL (Domestic Substances List)

Petroleum distillates, hydrotreated light (64742-47-8)

Listed on the Canadian DSL (Domestic Substances List)

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Borate(1-), tetrafluoro-, potassium (14075-53-7)
Listed on the Canadian DSL (Domestic Substances List)
Potassium fluoride (7789-23-3)
Listed on the Canadian DSL (Domestic Substances List)
Titanium nitride (25583-20-4)
Listed on the Canadian DSL (Domestic Substances List)
Aluminum (7429-90-5)
Listed on the Canadian DSL (Domestic Substances List)
Cobalt (7440-48-4)
Listed on the Canadian DSL (Domestic Substances List)

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 10/08/2019

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR) SOR/2015-17.

GHS Full Text Phrases:

Acute Tox. 1 (Oral)	Acute toxicity (oral) Category 1
Acute Tox. 2 (Dermal)	Acute toxicity (dermal) Category 2
Acute Tox. 3 (Oral)	Acute toxicity (oral) Category 3
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Aquatic Chronic 4	Hazardous to the aquatic environment - Chronic Hazard Category 4
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1B	Carcinogenicity Category 1B
Carc. 2	Carcinogenicity Category 2
Comb. Dust	Combustible Dust
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Eye Irrit. 2	Serious eye damage/eye irritation Category 2
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Liq. 4	Flammable liquids Category 4
Flam. Sol. 1	Flammable solids Category 1
Flam. Sol. 2	Flammable solids Category 2
Muta. 2	Germ cell mutagenicity Category 2
Repr. 1B	Reproductive toxicity Category 1B
Repr. 2	Reproductive toxicity Category 2
Resp. Sens. 1B	Respiratory sensitization, Category 1B
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Irrit. 2	Skin corrosion/irritation Category 2
Skin Sens. 1	Skin sensitization, Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3

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Water-react. 2	Substances and mixtures which in contact with water emit flammable gases Category 2
H227	Combustible liquid
H228	Flammable solid
H261	In contact with water releases flammable gas
H300	Fatal if swallowed
H301	Toxic if swallowed
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H334	May cause an allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H361	Suspected of damaging fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H401	Toxic to aquatic life
H402	Harmful to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life

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

NA GHS SDS 2015 (Can, US)