

Carbon Steel Alloy Steel

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations
Date of Issue: 08/30/2023

Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Carbon Steel Alloy Steel

Synonyms: Alloy #200; Alloy #900; Alloy #STAGCG57; Alloy #342; Alloy #2SA

1.2. Intended Use of the Product

Use of the Substance/Mixture: Cold Drawn Steel Bars.

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

Distributor

ThyssenKrupp Materials NA, Inc.

22355 W. Eleven Mile Road

Southfield, Michigan 48034

TEL: 248-233-5681

1.4. Emergency Telephone Number

Emergency Number : 248-233-5681

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US Classification

Classification as delivered:

Not classified

Classification Intended Use (Physical alteration resulting in fumes, dust, fines, and chips):

Flammable solids Category 1	H228
Pyrophoric solids Category 1	H250
Self-heating substances and mixtures Category 1	H251
Skin sensitization, Category 1	H317
Carcinogenicity Category 1B	H350
Reproductive toxicity Category 1A	H360
Reproductive toxicity, Additional category, Effects on or via lactation	H362
Specific target organ toxicity (repeated exposure) Category 1	H372
Hazardous to the aquatic environment – Acute Hazard Category 1	H400
Hazardous to the aquatic environment – Chronic Hazard Category 1	H410

Combustible Dust

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

2.2. Label Elements

GHS-US Labeling

Classification as delivered:

Not classified

Classification Intended Use (Physical alteration resulting in fumes, dust, fines, and chips):

Hazard Pictograms (GHS-US)



Signal Word (GHS-US)

: Danger

Hazard Statements (GHS-US)

: May form combustible dust concentrations in air.
H228 - Flammable solid.
H250 - Catches fire spontaneously if exposed to air.
H251 - Self-heating; may catch fire.
H317 - May cause an allergic skin reaction.
H350 - May cause cancer.
H360 - May damage fertility or the unborn child.
H362 - May cause harm to breast-fed children.

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Precautionary Statements (GHS-US)

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.

: P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P222 - Do not allow contact with air.
P235+P410 - Keep cool. Protect from sunlight.
P240 - Ground/Bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, and lighting equipment.
P260 - Do not breathe dust, fume.
P263 - Avoid contact during pregnancy/while nursing.
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 must not be allowed out of the workplace.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P302+P352 - If on skin: Wash with plenty of water.
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).
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P335+P334 - Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
P363 - Wash contaminated clothing before reuse.
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
P391 - Collect spillage.
P405 - Store locked up.
P407 - Maintain air gap between stacks/pallets.
P413 - Store bulk masses greater than ...kg/...lbs at temperatures not exceeding ...°C/...°F.
P420 - Store away from other materials.
P422 - Store contents under inert gas.
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

Supplemental Information

: This product is not hazardous in the form in which it is shipped by the manufacturer but may become hazardous as the result of downstream activities (e.g. welding, sawing, brazing, grinding, abrasive blasting, and machining) which creates fumes and/ or small particles resulting in the potential hazards listed below.

. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Proper grounding procedures to avoid static electricity should be followed. Prevent dust accumulation (to minimize explosion hazard). Avoid generating dust.

2.3. Other Hazards

Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath. 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. Risk of thermal burns on contact with molten product.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

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3.2. Mixture

Name	Synonyms	Product Identifier	%	GHS US classification
Iron	Iron, elemental / Direct reduced Iron / Iron, reduced / Elemental iron / IRON POWDER / iron	(CAS-No.) 7439-89-6	97 – 99	Flam. Sol. 1, H228 Self-heat. 1, H251 Comb. Dust
Nickel	Nickel metal / Nickel, elemental / Nickel, metallic / Nickel, metal / C.I. 77775	(CAS-No.) 7440-02-0	0.01 – 3.75	Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372 Comb. Dust
Chromium	Chromium metal / Chromium, elemental / Chromium, metal / Chromium, metallic / Chrome, metal / Chrome	(CAS-No.) 7440-47-3	0.01 – 2.5	Comb. Dust
Manganese	Manganese, elemental / Manganese metal / manganese	(CAS-No.) 7439-96-5	0.25 – 1.65	Flam. Sol. 2, H228 STOT RE 1, H372 Aquatic Acute 2, H401 Aquatic Chronic 2, H411 Comb. Dust
Molybdenum	Molybdenum, metallic / molybdenum / Molybdenum, metal / Molybdenum, elemental / Molybdenum metal	(CAS-No.) 7439-98-7	0.01 – 1.1	Repr. 2, H361 Comb. Dust
Carbon	Carbon, activated / CARBON / Activated carbon / Carbon Black / Graphite / Active carbon	(CAS-No.) 7440-44-0	0.01 – 1.1	Comb. Dust
Copper	Copper, metallic / Pigment Metal 2 / Copper metal / CI 77400 / Copper, elemental / C.I. Pigment Metal 2 / C.I. 77400 / Granulated copper / copper	(CAS-No.) 7440-50-8	0.01 – 0.5	Comb. Dust
Silicon	Silicon powder / Silicon powder, amorphous / SILICON / silicon	(CAS-No.) 7440-21-3	0.01 – 0.5	Comb. Dust
Tellurium	Tellurium, elemental	(CAS-No.) 13494-80-9	0.01 – 0.5	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Sens. 1B, H317 Repr. 1B, H360 Aquatic Chronic 4, H413 Comb. Dust
Lead	C.I. Pigment Metal 4 / Lead metal / Lead, elemental / C.I. 77575	(CAS-No.) 7439-92-1	0.15 – 0.35	Carc. 1B, H350 Repr. 1A, H360 Lact., H362 STOT RE 1, H372 Comb. Dust
Sulfur dioxide	Sulphur dioxide / Sulphurous anhydride / Sulfur(IV) oxide / Sulfur dioxide, anhydrous / Sulfur oxide (SO2) / sulfur dioxide	(CAS-No.) 7446-09-5	0.001 – 0.35	Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318

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Vanadium oxide (V2O5)	Vanadium pentoxide / Divanadium pentoxide / Divanadium pentaoxide / Vanadium pentaoxide / Vanadium(V) oxide / C.I. 77938	(CAS-No.) 1314-62-1	0.01 – 0.25	Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation:dust,mist), H332 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
Bismuth	bismuth	(CAS-No.) 7440-69-9	0.01 – 0.1	Comb. Dust
Aluminum	Aluminium / Aluminium metal / Aluminium, metal / Aluminum metal / Aluminum, elemental / Aluminum, metal / C.I. 77000 / Cl 77000 / Aluminium powder (stabilised) / Aluminium powder (stabilized) / Aluminium powder / Pigment Metal 1 / Aluminum powder / Aluminium metal, powder / aluminum	(CAS-No.) 7429-90-5	0.01 – 0.1	Comb. Dust
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) / Phosphorus, white / Red phosphorous / phosphorus / White phosphorus	(CAS-No.) 7723-14-0	0.01 – 0.04	Pyr. Sol. 1, H250 Acute Tox. 2 (Oral), H300 Acute Tox. 2 (Inhalation:dust,mist), H330 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

First-aid Measures General: If medical advice is needed, have product container or label at hand. Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). Removal of solidified material from skin, eyes, or mouth requires medical assistance.

First-aid Measures After 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.

First-aid Measures After Skin Contact: *Normal handling:* Immediately remove contaminated clothing. Wash affected area with soap and water for at least 15 minutes. Immerse in cool water/wrap in wet bandages. Brush off loose particles from skin. If exposed or concerned: Get medical advice/attention. *In molten form:* Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance. Get immediate medical advice/attention.

First-aid Measures After Eye Contact: *Contact with solid product or product dusts:* Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention. *Contact with molten material:* Removal of solidified molten material from the eyes requires medical assistance.

First-aid Measures After Ingestion: Rinse mouth. Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

Symptoms/Injuries: Not expected to present a significant hazard under anticipated conditions of normal use. The primary acute health hazard associated with this product would be the potential for exposure to fumes during metal processing operations. This product contains lead and nickel. Exposure to small chips, fine turnings, and dust from processing may cause cancer. Prolonged contact with large amounts of dust may cause mechanical irritation. May cause cancer. Causes damage to organs through prolonged or repeated exposure. Skin sensitization. May damage fertility. May damage the unborn child. May cause harm to breast-fed children. Risk of thermal burns on contact with molten product.

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Symptoms/Injuries After Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Dust may be harmful or cause irritation. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath.

Symptoms/Injuries After Skin Contact: Direct contact may cause irritation by mechanical abrasion. Contact with hot, molten metal will cause thermal burns. May cause an allergic skin reaction. Contact with fumes or metal powder will irritate skin.

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. Mechanical damage via flying particles and chipped slag is possible. During metal processing, dusts caused from physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Risk of thermal burns on contact with molten product.

Symptoms/Injuries After Ingestion: Ingestion may cause adverse effects.

Chronic Symptoms: In massive form, no chronic hazard exists. If physically altered to present slivers, ribbons, dusts or fumes from molten material: Overexposure to metal fumes may result metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude), disturbances in smell and/or taste, and possible discoloration of skin, hair and mucous membranes; discoloration may become permanent. May cause cancer. Causes damage to organs through prolonged or repeated exposure. May damage fertility or the unborn child.

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

If you feel unwell, seek medical advice (show the label where possible). If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use class D extinguishing media on fines, dust, or molten metal. *As shipped:* Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use water when molten material is involved, contact of hot product with water will result in a violent expansion as the water turns to steam causing explosion with massive force. Do not use halogenated extinguishing agents on small chips or fines.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: *In massive form:* Not flammable. Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp. If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. Molten material may react violently with water forming explosive or flammable reactions.

Explosion Hazard: Product itself is not explosive but if dust is generated, dust clouds suspended in air can be explosive. Dust generated from processing may present a dust explosion hazard. Chips, fines, and dust can react with water forming explosive/flammable hydrogen gas. Molten material may react violently with water forming explosive or flammable reactions. Molten material may react violently with water forming explosive or flammable reactions.

Reactivity: Stable at ambient temperature and under normal conditions of use. For particulates and dust: Reacts violently with strong oxidizers. Increased risk of fire or explosion. In molten form may react violently with water.

5.3. Advice for Firefighters

Precautionary Measures Fire: Under fire conditions, hazardous fumes will be present. Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not breathe fumes from fires or vapours from decomposition. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products. 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.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Remove ignition sources. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Where possible allow molten material to solidify naturally. Do not breathe fumes from molten product. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Avoid generating dust.

6.1.1. For Non-Emergency Personnel

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

Emergency Procedures: Evacuate unnecessary personnel. Avoid creating or spreading dust.

6.1.2. For Emergency Personnel

Protective Equipment: Wear suitable protective clothing, gloves and eye/face protection. Equip cleanup crew with proper protection.

Emergency Procedures: Eliminate ignition sources. Evacuate unnecessary personnel, isolate, and ventilate area. 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.

6.2. Environmental Precautions

Notify authorities if product enters sewers or public waters. Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage. Avoid release of dust/fines to waterways to avoid potential bioaccumulation.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Remove ignition sources. Use only non-sparking tools. Contain and collect as any solid. Avoid generation of dust during clean-up of spills. Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. If metal is in molten form allow to cool and collect as a solid. If metal is in solid form collect for re-melting purposes. As an immediate precautionary measure, isolate spill or leak area in all directions. Recycle or dispose of in compliance with current legislation.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. *For dust spills:* Clean up immediately by sweeping or vacuum. Use only non-sparking tools. 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. *In molten form:* Cool molten material to limit spreading. Allow product to completely solidify, then scrape product from hard surface. Avoid generation of dust clouds. Place solidified product in appropriate waste container. 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. See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

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SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Product dust is combustible. Use care during processing to minimize generation of dust. Warning! Contains lead. When immersed in furnace, splashing of molten metal can occur. Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions. All tooling and containers which come in contact with molten metal must be preheated or specially coated and rust free. Molds and ladles must be preheated or oiled prior to casting. Any surfaces that may contact molten metal (e.g. concrete) should be specially coated. Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards. During melting operations, the following minimum guidelines should be observed:

-Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.

-Store materials in dry, heated areas with any cracks or cavities pointed downwards.

-Preheat and dry large or heavy items such as ingot adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the internal metal temperature of the coldest item of the batch to 400 °F (204 °C) and then hold at that temperature for 6 hours. . Handle empty containers with care because residual vapors are flammable. Avoid dust production. 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. May be a potential hazard under the following conditions: Small chunks, dust or fines in contact with water can generate flammable or toxic gases. These gases could present an explosion hazard in confined or poorly ventilated spaces. Finely divided metals (e.g. powders or wire) may have enough surface oxide to produce thermite reactions/explosions. If suspected of containing moisture, product should be THOROUGHLY DRIED before being added to a molten bath. Otherwise, entrained moisture could expand explosively and spatter molten metal out of the bath. Risk of thermal burns on contact with molten product.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Do not breathe dust. Avoid contact with eyes, skin and clothing. Avoid creating or spreading dust.

Hygiene Measures: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

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

Storage Conditions: Store in original container. Store in dry protected location to prevent any moisture contact. Keep away from heat and flame. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store locked up/in a secure area. Store in a well-ventilated place. Keep container tightly closed. Keep in fireproof place.

Incompatible Materials: Corrosive substances in contact with metals may produce flammable hydrogen gas. Alkalis. Strong acids, strong bases, strong oxidizers. Mineral acids. *When molten:* Water. *Dust, fines, and chips:* Water.

7.3. Specific End Use(s)

Cold Drawn Steel Bars.

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), or OSHA (PEL).

Nickel (7440-02-0)		
USA ACGIH	ACGIH OEL TWA	1.5 mg/m ³ (inhalable particulate matter)
USA ACGIH	ACGIH chemical category	Not Suspected as a Human Carcinogen
USA ACGIH	BEI (BLV)	5 µg/l Parameter: Nickel - Medium: urine - Sampling time: post-shift at end of workweek (background)
USA NIOSH	NIOSH REL (TWA)	0.015 mg/m ³
USA IDLH	IDLH	10 mg/m ³
USA OSHA	OSHA PEL (TWA) [1]	1 mg/m ³

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Chromium (7440-47-3)		
USA ACGIH	ACGIH OEL TWA	0.5 mg/m ³ (inhalable particulate matter)
USA ACGIH	BEI (BLV)	0.7 µg/l Parameter: Total chromium - Medium: urine - Sampling time: end of shift at end of workweek (population based)
USA NIOSH	NIOSH REL (TWA)	0.5 mg/m ³
USA IDLH	IDLH	250 mg/m ³
USA OSHA	OSHA PEL (TWA) [1]	1 mg/m ³
Manganese (7439-96-5)		
USA ACGIH	ACGIH OEL TWA	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 NIOSH	NIOSH REL (TWA)	1 mg/m ³ (fume)
USA NIOSH	NIOSH REL (STEL)	3 mg/m ³
USA IDLH	IDLH	500 mg/m ³
USA OSHA	OSHA PEL (Ceiling)	5 mg/m ³ (fume)
Molybdenum (7439-98-7)		
	Internal OEL Value(s)	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds)
USA ACGIH	ACGIH OEL TWA	10 mg/m ³ (inhalable particulate matter) 3 mg/m ³ (respirable particulate matter)
USA NIOSH	NIOSH REL (TWA)	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds)
USA IDLH	IDLH	5000 mg/m ³
USA OSHA	OSHA PEL (TWA) [1]	5 mg/m ³ (Molybdenum (as Mo), Soluble Compounds) 15 mg/m ³ (Molybdenum (as Mo), Insoluble Compounds (Total dust))
Copper (7440-50-8)		
USA ACGIH	ACGIH OEL TWA	0.2 mg/m ³ (fume)
USA NIOSH	NIOSH REL (TWA)	1 mg/m ³ (dust and mist) 0.1 mg/m ³ (fume)
USA IDLH	IDLH	100 mg/m ³ (dust, fume and mist)
USA OSHA	OSHA PEL (TWA) [1]	0.1 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Silicon (7440-21-3)		
USA NIOSH	NIOSH REL (TWA)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
USA OSHA	OSHA PEL (TWA) [1]	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
Tellurium (13494-80-9)		
USA ACGIH	ACGIH OEL TWA	0.1 mg/m ³
USA NIOSH	NIOSH REL (TWA)	0.1 mg/m ³
USA IDLH	IDLH	25 mg/m ³
USA OSHA	OSHA PEL (TWA) [1]	0.1 mg/m ³
Lead (7439-92-1)		
USA ACGIH	ACGIH OEL TWA	0.05 mg/m ³
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
USA ACGIH	BEI (BLV)	200 µg/l Parameter: Lead - Medium: blood - Sampling time: not critical (Note: Persons applying this BEI are encouraged to counsel female workers of child-bearing age about the risk of delivering a child with a PbB (lead in blood level) over the current CDC reference value.)
USA NIOSH	NIOSH REL (TWA)	0.05 mg/m ³
USA IDLH	IDLH	100 mg/m ³
USA OSHA	OSHA PEL (TWA) [1]	50 µg/m ³
USA OSHA	OSHA Action Level/Excursion Limit	30 µg/m ³ (Action Level, see 29 CFR 1910.1025)
Sulfur dioxide (7446-09-5)		
USA ACGIH	ACGIH OEL STEL [ppm]	0.25 ppm

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USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA)	5 mg/m ³
USA NIOSH	NIOSH REL TWA [ppm]	2 ppm
USA NIOSH	NIOSH REL (STEL)	13 mg/m ³
USA NIOSH	NIOSH REL STEL [ppm]	5 ppm
USA IDLH	IDLH [ppm]	100 ppm
USA OSHA	OSHA PEL (TWA) [1]	13 mg/m ³
USA OSHA	OSHA PEL (TWA) [2]	5 ppm
Vanadium oxide (V2O5) (1314-62-1)		
USA ACGIH	ACGIH OEL TWA	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)	0.05 mg/m ³ (dust and fume)
USA IDLH	IDLH	35 mg/m ³ (dust and fume)
USA OSHA	OSHA PEL (Ceiling)	0.5 mg/m ³ (Respirable dust (as V2O5)) 0.1 mg/m ³ (Fume (as V2O5))
Aluminum (7429-90-5)		
USA ACGIH	ACGIH OEL TWA	1 mg/m ³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
USA OSHA	OSHA PEL (TWA) [1]	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)

8.2. Exposure Controls

Appropriate Engineering Controls

: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Avoid dust production. Avoid creating or spreading dust. 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 no leakage from the equipment). Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. 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. 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.

Personal Protective Equipment

: Safety glasses. Insufficient ventilation: wear respiratory protection. Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing

: With molten material wear thermally protective clothing. Chemically resistant materials and fabrics. Wear fire/flammable resistant/retardant clothing.

Hand Protection

: Wear protective gloves. When needed, wear protective gloves to protect against thermal and/or mechanical hazards.

Eye and Face Protection

: Chemical goggles or face shield. Chemical safety goggles.

Skin and Body Protection

: Wear suitable protective clothing.

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Respiratory Protection	: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits. 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.
Thermal Hazard Protection	: If material is hot, wear thermally resistant protective gloves.
Environmental Exposure Controls	: Do not allow the product to be released into the environment.
Consumer Exposure Controls	: Not applicable. Avoid contact during pregnancy/while nursing.
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	: Metallic.
Odor	: Odorless
Odor Threshold	: Not applicable
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: 626.67 °F (330.37 °C)
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: Not applicable
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: Flammable solid
Vapor Pressure	: No data available
Relative Vapor Density at 20°C	: No data available
Relative Density	: No data available
Specific Gravity	: 1.77
Solubility	: Insoluble in water.
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: No data available

9.2. Other Information

No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Stable at ambient temperature and under normal conditions of use. *For particulates and dust:* Reacts violently with strong oxidizers. Increased risk of fire or explosion. In molten form may react violently with water.

10.2. Chemical Stability

Stable under recommended handling and storage conditions (see section 7). *For particulates and dust:* Self-heating; may catch fire. Catches fire spontaneously if exposed to air. Flammable solid. Metallic dusts may ignite or explode.

10.3. Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

10.4. Conditions to Avoid

For particulates and dust: Incompatible materials. Do not allow contact with air. Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources. Dust accumulation (to minimize explosion hazard). Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp.

10.5. Incompatible Materials

Corrosive substances in contact with metals may produce flammable hydrogen gas. Alkalis. Strong acids, strong bases, strong oxidizers. Mineral acids. When molten: water. Dust, fines, and chips: . Water.

10.6. Hazardous Decomposition Products

None expected under normal conditions of use. Thermal decomposition may produce: Metal oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects

Acute Toxicity (Oral): Not classified

Acute Toxicity (Dermal): Not classified

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Acute Toxicity (Inhalation): Not classified

Iron (7439-89-6)	
LD50 Oral Rat	98.6 g/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
Manganese (7439-96-5)	
LD50 Oral Rat	> 2000 mg/kg
LC50 Inhalation Rat	> 5.14 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
Carbon (7440-44-0)	
LD50 Oral Rat	> 10000 mg/kg
Copper (7440-50-8)	
LC50 Inhalation Rat	> 5.11 mg/l/4h
Silicon (7440-21-3)	
LD50 Oral Rat	3160 mg/kg
Tellurium (13494-80-9)	
LD50 Oral Rat	83 mg/kg
LC50 Inhalation Rat	> 2.42 mg/l/4h
Lead (7439-92-1)	
LD50 Oral Rat	> 5000 mg/kg
LC50 Inhalation Rat	> 5.05 mg/l/4h No observed mortality. No abnormalities detected at necropsy.
Sulfur dioxide (7446-09-5)	
LC50 Inhalation Rat	965 – 1168 ppm/4h
ATE (Gases)	1,250.00 ppmV/4h
Vanadium oxide (V2O5) (1314-62-1)	
LD50 Oral Rat	221 mg/kg (Species: Sprague-Dawley)
LD50 Dermal Rat	> 2500 mg/kg body weight
LC50 Inhalation Rat	2.21 mg/l/4h
ATE (Dust/Mist)	4.29 mg/l/4h
Bismuth (7440-69-9)	
LD50 Oral Rat	5 g/kg
Aluminum (7429-90-5)	
LC50 Inhalation Rat	> 0.888 mg/L/4h (No deaths)
Phosphorus elemental (7723-14-0)	
LD50 Oral Rat	> 15000 mg/kg
LC50 Inhalation Rat	1.5 mg/l/4h (Exposure time: 1 h)
ATE (Vapors)	1.50 mg/l/4h
ATE (Dust/Mist)	0.05 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: May cause an allergic skin reaction.

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer.

Nickel (7440-02-0)	
IARC group	2B

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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
Lead (7439-92-1)	
IARC group	2A
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Sulfur dioxide (7446-09-5)	
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.

Reproductive Toxicity: May damage fertility or the unborn child. May cause harm to breast-fed children. (This material or its emissions may appear in breast milk of nursing mothers.)

Specific Target Organ Toxicity (Single Exposure): Not classified

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

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. . Dust may be harmful or cause irritation. Inhalation of dusts and fumes can cause metal fume fever. Symptoms can include a metallic or sweet taste in the mouth, sweating, shivering, headache, throat irritation, fever, chills, thirstiness, muscle aches, nausea, vomiting, weakness, fatigue, and shortness of breath.

Symptoms/Injuries After Skin Contact: Direct contact may cause irritation by mechanical abrasion. Contact with hot, molten metal will cause thermal burns. May cause an allergic skin reaction. Contact with fumes or metal powder will irritate skin.

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. . Mechanical damage via flying particles and chipped slag is possible. During metal processing, dusts caused from physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Risk of thermal burns on contact with molten product.

Symptoms/Injuries After Ingestion: Ingestion may cause adverse effects.

Chronic Symptoms: In massive form, no chronic hazard exists. If physically altered to present slivers, ribbons, dusts or fumes from molten material: Overexposure to metal fumes may result metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, lassitude), disturbances in smell and/or taste, and possible discoloration of skin, hair and mucous membranes; discoloration may become permanent. May cause cancer. Causes damage to organs through prolonged or repeated exposure. May damage fertility or the unborn child.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

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

Nickel (7440-02-0)	
LC50 Fish 1	100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
EC50 - Crustacea [1]	100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 Fish 2	15.3 mg/l
EC50 - Crustacea [2]	1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
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)
Molybdenum (7439-98-7)	
LC50 Fish 1	800 – 1320 mg/l

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Copper (7440-50-8)	
LC50 Fish 1	0.0068 – 0.0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 - Crustacea [1]	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 Fish 2	< 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
Vanadium oxide (V2O5) (1314-62-1)	
LC50 Fish 1	4.46 mg/l
NOEC Chronic Fish	0.073 mg/l
Phosphorus elemental (7723-14-0)	
LC50 Fish 1	33.2 mg/l Red Phosphorous (Exposure time: 96 h - Species Danio rerio [static])
EC50 - Crustacea [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 - Crustacea [2]	0.025 – 0.037 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

12.2. Persistence and Degradability

Carbon Steel Alloy Steel	
Persistence and Degradability	Inorganic product which cannot be eliminated from water by biological purification processes. May cause long-term adverse effects in the environment.
Copper (7440-50-8)	
Persistence and Degradability	Not readily biodegradable.

12.3. Bioaccumulative Potential

Carbon Steel Alloy Steel	
Bioaccumulative Potential	Bioaccumulation of metals cannot be excluded. Not established.
Sulfur dioxide (7446-09-5)	
BCF Fish 1	(no bioaccumulation expected)
Phosphorus elemental (7723-14-0)	
BCF Fish 1	(200 dimensionless)

12.4. Mobility in Soil

Carbon Steel Alloy Steel	
Ecology - Soil	Adsorption to solid soil phase is not expected.

12.5. Other Adverse Effects

Other Adverse Effects : None known.
Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste Treatment Methods: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

Sewage Disposal Recommendations: Do not dispose of waste into sewer. Do not empty into drains.

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

Additional Information: Recycle the material as far as possible. Handle empty containers with care because residual product is flammable. Recover or recycle if possible.

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

Marine Pollutant : Marine pollutant

14.2. In Accordance with IMDG

Marine Pollutant : Marine pollutant

14.3. In Accordance with IATA

Not regulated for transport

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*The shipping descriptions above do not apply to forms of this product that may result from further processing (such as dust, fines, and chips). Shipping classifications must be reassessed if the form of the product is altered.

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Carbon Steel Alloy Steel	
SARA Section 311/312 Hazard Classes	Health hazard - Carcinogenicity Health hazard - Reproductive toxicity Health hazard - Specific target organ toxicity (single or repeated exposure) Health hazard - Respiratory or skin sensitization Physical hazard - Self-heating Physical hazard - Pyrophoric (liquid or solid) Physical hazard - Flammable (gases, aerosols, liquids, or solids) Physical hazard - Combustible dust
Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Nickel (7440-02-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active 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 - Status: Active 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 %
Manganese (7439-96-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %
Molybdenum (7439-98-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Carbon (7440-44-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Copper (7440-50-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active 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 %
Silicon (7440-21-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Tellurium (13494-80-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Lead (7439-92-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	10 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	0.1 %

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Sulfur dioxide (7446-09-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Listed on the United States SARA Section 302	
SARA Section 302 Threshold Planning Quantity (TPQ)	500 lb
Vanadium oxide (V2O5) (1314-62-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Listed on the United States SARA Section 302	
CERCLA RQ	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	100 – 10000 lb
Bismuth (7440-69-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (dust or fume only)
Phosphorus elemental (7723-14-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
Listed on the United States SARA Section 302	
Subject to reporting requirements of United States SARA Section 313	
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)

15.2. US State Regulations

Nickel (7440-02-0)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
Chromium (7440-47-3)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
Manganese (7439-96-5)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
Molybdenum (7439-98-7)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
Copper (7440-50-8)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
Silicon (7440-21-3)
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List

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Tellurium (13494-80-9)

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

Lead (7439-92-1)

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

Sulfur dioxide (7446-09-5)

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

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

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


Aluminum (7429-90-5)

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

Phosphorus elemental (7723-14-0)

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

California Proposition 65

 **WARNING:** This product can expose you to Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. 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			
Lead (7439-92-1)	X	X	X	X
Sulfur dioxide (7446-09-5)		X		
Vanadium oxide (V ₂ O ₅) (1314-62-1)	X			

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

Date of Preparation or Latest Revision : 08/30/2023

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200. This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

H228	Flammable solid
H250	Catches fire spontaneously if exposed to air
H251	Self-heating; may catch fire
H280	Contains gas under pressure; may explode if heated
H300	Fatal if swallowed
H301	Toxic if swallowed

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H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H330	Fatal if inhaled
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H361	Suspected of damaging fertility or the unborn child
H362	May cause harm to breast-fed children
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H401	Toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic 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.

SDS US (GHS HazCom)