



# Safety Data Sheet

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Trade Name:** Steel

**CAS Number:** Not applicable

**Synonyms:** Carbon Steels

**Use/Description:** Bar, sheet, pipe, tubing, and structural steel products

**Manufacturer / Supplier Information:**

Steel & Pipe Supply Co., Inc.

555 Poyntz Ave.

Manhattan, KS 66502

**Phone:** 800-521-2345

**Emergency #:** 800-424-9300 CHEMTREC

## 2. HAZARD(S) IDENTIFICATION

**Emergency Overview:** STEEL PRODUCTS AS SOLD BY SPS ARE NOT HAZARDOUS PER OSHA GHS 29 CFR 1910, 1915, 1926. However, individual customer processes such as welding, sawing, brazing, grinding, abrasive blasting, and machining may result in the formation of fumes, dust (combustible or otherwise), and/or particulate that may present the following hazards:

**OSHA Hazards:** Carcinogen  
Skin Sensitizer  
Target Organ Effect – Lungs

**GHS Classification:** Carcinogenicity (Category 2)  
Skin Sensitization (Category 1)  
Specific Target Organ Toxicity-Repeated Exposure Category 1)

**Pictograms(s):**



**Signal Word:** Danger

**Hazard Statement(s):**

Dust/fumes may cause an allergic skin reaction  
 Dust/fumes suspected of causing cancer via inhalation  
 Inhalation of dust/fumes causes damage to respiratory tract through prolonged or repeated exposure.

**Precautionary Statement(s):**

Do not handle until all safety precautions have been read and understood.  
 Avoid breathing dust/fumes.  
 Use personal protective equipment as required.  
 If exposed or concerned: Get medical advice/attention.

**Potential Health Effects:**

**Eye Contact** - Dusts or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.

**Skin Contact** – Dusts or particulates may cause mechanical irritation due to abrasion. Coated steel may cause skin irritation in sensitive individuals (see Section 16 for additional information). Some components in this product are capable of causing an allergic reaction, possibly resulting in burning, itching and skin eruptions. Contact with heated material may cause thermal burns.

**Inhalation** – Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dusts may result in metal fume fever, and influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat, cough, shortness of breath, pulmonary edema, general malaise, weakness, fatigue, muscle and joint pains, blurred vision, fever and chills. Typical symptoms last from 12 – 48 hours.

**Ingestion** – Not expected to be acutely toxic via ingestion based on the physical and chemical properties of the product. Swallowing of excessive amounts of the dust may cause irritation, nausea, and diarrhea.

**Potential Fire and Explosion Hazards:** Under normal conditions, steel products do not present fire or explosion hazards, and dust generated by handling steel products is oxidized and no combustible. Processing of steel products by some individual customers may produce potentially combustible dust that may represent a fire or explosion hazard.

**Chronic or Special Toxic Effects** – Repeated exposure to fine dusts may inflame the nasal mucosa and cause changes to the lung. In addition, a red=brown pigmentation of the eye and/or skin may occur. Welding fumes have been associated with adverse health effects. Contains components that may cause cancer or reproductive effects. The following components are listed by NTP, OSHA, or IARC as carcinogens: Nickel, chromium (hexavalent), cobalt, lead, cadmium, antimony (trioxide), arsenic, and beryllium. See Section 11 for additional specific information on effects noted above.

**Target Organs** – Overexposure to specific components of this product that are generated in dusts or fumes may cause adverse effects to the following organs or systems: eyes, skin, liver, kidney, central nervous system, cardiovascular system, respiratory system.

**Medical Conditions Aggravated by Exposure:** - Diseases of the skin such as eczema may be aggravated by exposure. Also, disorders of the respiratory system including asthma, bronchitis, and emphysema. Long-term inhalation exposure and agents that cause pneumoconiosis (e.g. dust) may act synergistically with inhalation of oxide fumes or dusts of this product.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

CAS#	Component	Percent
1309-37-1	Iron oxide	<97
7439-89-6	Iron	>16.7
7440-47-3	Chromium	0-11
7440-66-6	Zinc	0-10
7440-02-0	Nickel	0-9.5
124-38-9	Carbon dioxide	0-5.5
630-08-0	Carbon monoxide	0-5.5
7440-44-0	Carbon	0-5.5
7439-98-7	Molybdenum	0-5
7440-21-3	Silicon	0-4

7439-96-5	Manganese	0-3
7440-50-8	Copper	0-2.5
7429-90-5	Aluminum	0-2
7704-34-9	Sulfur	0-2
1344-28-1	Aluminum oxide	0-2
7440-69-9	Bismuth	0-1.5
7440-32-6	Titanium	0-1
7440-62-2	Vanadium	0-1
1314-62-1	Vanadium pent oxide	0-1
7440-42-8	Boron	0-0.9
7440-36-0	Antimony	0-0.9
7440-70-2	Calcium	0-0.9
7439-95-4	Magnesium	0-0.9
7727-37-9	Nitrogen	0-0.9
10102-43-9	Nitric oxide	0-0.9
10102-44-0	Nitrogen dioxide	0-0.9
7723-14-0	Phosphorus	0-0.9
7782-49-2	Selenium	0-0.9
7440-31-5	Tin	0-0.9
7440-33-7	Tungsten	0-0.9
7440-03-1	Niobium	0-0.9
13494-80-9	Tellurium	0-0.5

The above listing is a summary of elements used in carbon and alloy steels. Various grades will contain different combinations of the elements. Other trace elements may also be present in minute amounts. These small quantities (less than 0.1%) are frequently referred to as “trace” or “residual” elements; generally they originate in the raw material used. Such elements would include arsenic (As), Beryllium (Be), Cadmium (Cd), cobalt (Co), lead (Pb), mercury (Hg), oil mist (the product may have a light coating of oil to prevent corrosion), oxygen (O), selenium (Se), tellurium (Te), and zirconium (Zr). Various byproducts of processing from these trace elements may include lead chromate, ozone, polybrominated biphenyls (PBB), and polybrominated diphenyl ether (PBDE), and these byproducts may also be considered trace. If listed in the above table, the ingredient is considered to be a component rather than trace.

Carbon and alloy steel products as provided contain chromium metal in the zero valence state. As such, chromium metal does not present any unusual health hazard. However, welding, torch cutting, brazing, or grinding of chromium metal in carbon and alloy steel may generate airborne concentrations of hexavalent chromium.

#### **4. FIRST AID MEASURES**

**Eye Contact** – In case of overexposure to dusts or fumes, immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the eye lids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies.

**Skin Contact** – In case of overexposure to dusts or particulates, wash with soap and plenty of water. Get medical attention if irritation develops or persists. If thermal burn occurs. Flush area with cold water and get immediate medical attention.

**Inhalation** – In case of overexposure to dusts or fumes, remove to fresh air. Get immediate medical attention of symptoms described in the SDS develop.

**Ingestion** – Not considered an ingestion hazard. However, if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention.

**Notes to physician** – Inhalation of metal fumes or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malaise, nausea, vomiting, muscle cramps, and remarkable leukocytosis. Treatment is symptomatic, and condition is self-limited in 24-48 hours. Chronic exposure to dusts may result in pneumoconiosis of mixed type.

## **5. FIRE FIGHTING MEASURES**

**Flash Point (Method)** – Not applicable

**Flammable Limits (% volume in air)** – Not applicable

**Auto ignition Temperature** – Not applicable

**Extinguishing Media** – For molten metal, use dry powder or sand. For steel dust use dry sand, water, foam, argon or nitrogen.

**Special Fire Fighting Procedures** – Do not use water on molten metal. Do not use Carbon Dioxide. Firefighters should not enter confined spaces without wearing NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full mask and full protective equipment.

**Unusual Fire or Explosion Hazards** – Steel products do not present fire or explosion hazards under normal conditions. Any non-oxidized fine metal particles / dust generated by grinding, sawing, abrasive blasting, or individual customer processes may produce materials that the customer should test for combustibility and other hazards in accordance with applicable regulations. High Concentrations of combustible metallic fines in the air may present an explosion hazard.

## **6. ACCIDENTAL RELEASE MEASURES**

**Precautions if Material is Spilled or Released** – Emergency response is unlikely unless in the form of combustible dust. Avoid inhalation, eye, or skin contact of dusts by using appropriate precautions outlined in this SDS (see section 8). Fine turnings and small chips should be swept or vacuumed and placed into appropriate disposable containers. Keep fine dust or powder away from sources of ignition. Scrap should be reclaimed for recycling. Prevent materials from entering drains, sewers, or waterways. Specific standards and regulations may be applicable to materials generated by individual customer processes. As appropriate, these standards and regulations should be consulted for applicability.

**Fire and Explosion Hazards** – Some customer processes may generate combustible dust that may require specific precautions when cleaning spills or releases of dust.

**Environmental Precautions** – Some grades of steel may contain reportable quantities of alloying elements. See Section 15 for additional information.

**Waste Disposal Methods** – Dispose of used and unused product in accordance with applicable Federal, State, and Local regulations. Please recycle.

## **7. HANDLING AND STORAGE**

**Storage Temperatures** – Stable under normal temperatures and pressures.

**Precautions to be taken in Handling and Storing** – Store away from strong oxidizers. Dusts and/or powders, alone, or combined with process specific fluids, may form explosive mixtures in the air. Applicable Federal, State, and Local laws and regulations may require testing dust generated from processing of steel products to determine if it represents a fire or explosion hazard and to determine appropriate protection methods. Avoid breathing dusts or fumes.

## **8. EXPOSURE CONTROL / PERSONAL PROTECTION**

Operations with potential for generating high concentrations of airborne particulates or fumes should be evaluated and controlled as necessary.

**Eye Protection** – Use Safety Glasses. Dust resistant safety goggles are recommended under circumstances where particles could cause mechanical injury such as grinding or cutting. Face shield should be used when welding or cutting.

**Skin** – Appropriate protective gloves should be worn as necessary. Good personal hygiene practices should be followed including cleansing exposed skin several times daily with soap and water and laundering or dry cleaning soiled work clothing.

**Respiratory Protection** – NIOSH/MSHA approved dust/fume/mist respirator should be used to avoid excessive exposure. See Section 3 for component material information. If such concentrations are sufficiently high that this respirator is inadequate, or high enough to cause oxygen deficiency, use a positive pressure self-contained breathing apparatus (SCBA). Follow all applicable respirator use, fitting, and training standards and regulations.

**Ventilation** – Provide general and/or local exhaust ventilation to control airborne levels of dust or fumes below exposure limits.

**Exposure Guidelines** – No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. See Section 3 for component materials. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

## **9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance and Odor** – Silver grey to grey black with metallic luster.

**Boiling Point** – Not applicable

**Melting Point** – Approximately 2800 degrees F.

**pH** – Not applicable

**Specific Gravity (at 15.6 degrees C)** – Not applicable

**Density (at 15.6 degrees C)** – Not applicable

**Vapor Pressure** – Not applicable

**Vapor Density (air=1)** – Not applicable

**Solubility in Water** – Insoluble

**Evaporation Rate (Butyl Acetate=1)** – Not applicable

**Other Physical and Chemical Data** – None

## **10. STABILITY AND REACTIVITY**

**Stability** – Stable

**Conditions to avoid** – Steel at temperatures above the melting point may liberate fumes containing oxides of iron and alloying elements. Avoid generation of airborne fume.

**Hazardous Polymerization** – Will not occur

**Incompatibility (Materials to Avoid)** – Reacts with strong acids to form hydrogen gas. Do not store near strong oxidizers.

**Hazardous Decomposition Products** – Metallic fumes may be produced during welding, burning, grindings, and possibly machining or any situation with the potential for thermal decomposition. Refer to ANSI Z49.1.

## **11. TOXICOLOGICAL INFORMATION**

The primary component of this product is iron. Long-term exposure to iron dusts or fumes can result in a condition called siderosis which is considered to be a benign pneumoconiosis. Symptoms may include chronic bronchitis, emphysema, and shortness of breath upon exertion. Penetration of iron particles in the skin or eye may cause an exogenous or ocular siderosis which may be characterized by a red-brown pigmentation of the affected area. Ingestion overexposures to iron may affect the gastrointestinal, nervous, and hematopoietic system and the liver. Iron and steel founding, but not iron or iron oxide, has been listed as carcinogenic (Group 1) by IARC.

When this product is welded, fumes are generated. Welding fumes may be different in composition from the original welding product, with the chief component being ordinary oxides of the metal being welded. Chronic health effects (including cancer) have been associated with the fumes and dusts of individual component metals and welding fumes as a general category have been listed by IARC as a carcinogen (Group 2B). There is also limited evidence that welding fumes may cause adverse reproductive and fetal effects. Evidence is stronger where welding materials contain known reproductive toxins, e.g., lead, which may be present in the coating material of this product.

Breathing fumes or dusts of this product may result in metal fume fever, which is an illness produced by inhaling metal oxides. These oxides are produced by heating various metals including cadmium, zinc, magnesium, copper, antimony, nickel, cobalt, manganese, tin, lead, beryllium, silver, chromium, aluminum, selenium, iron, and arsenic. The most common agents involved are zinc and copper.

This product may contain small amounts of manganese. Prolonged exposure to manganese dusts or fumes is associated with “manganism”, a Parkinson-like syndrome characterized by a variety of neurological symptoms including muscle spasms, gait disturbances, tremors, and psychoses.

This product may contain small amounts of cadmium. Primary target organs of cadmium overexposure are the lung and the kidney. Because of its cumulative nature, chronic cadmium poisoning can cause serious disease which takes many years to develop and may continue to progress despite cessation of exposure. Progression of the disease may not reflect current exposure conditions. It is also capable of causing painful osteomalacia called “Itai-Itai” in postmenopausal women, and has caused developmental effects and/or reproductive effects in male and female animals. Cadmium is a listed carcinogen by NTP, OSHA, and IARC (Group 1).

This product may contain small amounts of chromium. Prolonged and repeated overexposure to chromium dusts or fumes may cause skin ulcers, nasal irritation and ulceration, kidney damage and cancer of the respiratory system. Chromium is a

skin sensitizer. Cancer is general attributed to the hexavalent (+6) form of chromium which is listed as a carcinogen by NTP and IARC (Group 1).

This product may contain small amounts of nickel. Prolonged and repeated contact with nickel may cause sensitization dermatitis. Inhalation of nickel compounds has caused lung damage as well as sinus, nasal and lung cancer in laboratory animals. Nickel is a listed carcinogen by NTP and IARC (Group 1).

This product may contain small amounts of vanadium. Adverse effects from dermal, inhalation or parenteral exposure to various vanadium compounds have been reported. The major target for vanadium pent oxide toxicity is the respiratory tract. Fumes or dust can cause severe eye and respiratory irritation, and systemic effects. Chronic bronchitis, green tongue, conjunctivitis, pharyngitis, rhinitis, rales, chronic productive cough, and tightness of the chest have been reported following exposure. Allergic reactions resulting from skin and inhalation exposures have also been reported. A statistical association between vanadium air levels and lung cancer has been suggested, but vanadium currently is not regarded as a human carcinogen.

This product may contain small amounts of lead. Lead can accumulate in the body. Consequently, exposure to fumes or dust may produce signs of polyneuritis, diminished vision and peripheral neuropathy, such as tingling and loss of feeling in the fingers, arms and legs. Lead is a known reproductive and developmental toxin. It is also associated with central nervous system disorders, anemia, and kidney dysfunction and neurobehavioral abnormalities. The brain is a major target organ for lead exposure. Elemental lead is list as an IARC 2B carcinogen.

This product may contain small amounts of copper. Copper dust and fumes can irritate the eyes, nose and throat causing coughing, wheezing, nosebleeds, ulcers, and metal fume fever. Other effects from repeated inhalation of copper fumes include a metallic or sweet taste and discoloration of skin, teeth or hair. Copper also may cause an allergic skin reaction. Overexposure to copper can affect the liver.

## **12. ECOLOGICAL INFORMATION**

**Aquatic Ecotoxicological Data** – No specific information available on this product.

**Environmental Fate Data** – Np specific information available on this product.

## **13. DISPOSAL CONSIDERATIONS**

Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. Disposal in accordance with federal, state, and local health and environmental regulations. Prevent materials from entering drains, sewers, or waterways.

## **14. TRANSPORT INFORMATION**

**DOT Proper Shipping Name** – Not regulated

**DOT Hazard Classification** – Not regulated

**UN/NA Number** – Not applicable

**DOT Packing Group** – Not applicable

**Labeling Requirements** – Not applicable

**Placards** – Not applicable

**DOT Hazardous Substance** – Not applicable

**DOT Marine Pollutant** – Not applicable

## **15. REGULATORY INFORMATION**

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, dusts and fumes from this product may be combustible or hazardous and require protection to comply with applicable Federal state and local laws and regulations.

**California Proposition 65:** This product contains chemicals (antimony [oxide], arsenic, beryllium, chromium [hexavalent], cobalt, cadmium, lead, nickel) known to the State of California to cause cancer and chemicals (cadmium, lead) known to the State of California to cause birth defects or other reproductive harm.

**Massachusetts Substance List:** Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Titanium, Tungsten, Vanadium, Zinc.

**Pennsylvania Hazardous Substance List:** Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Tungsten, Vanadium, Zinc.

**New Jersey Hazardous Substance List:** Aluminum, Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Phosphorus, Selenium, Silicon, Sulfur, Tin, Tungsten, Vanadium, Zinc.

**Toxic Substances Control Act (TSCA):** Components of this product are listed in the TSCA inventory.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** Steel is not reportable, however, it contains hazardous substances that may be reportable if released in pieces with diameters less than or equal to .004 inches (RQ marked with a “\*”).

<u>Chemical Name</u>	<u>Reportable Quantity (in lb)</u>
Antimony	5000*
Arsenic	1*
Beryllium	10*
Cadmium	10*
Chromium	5000*
Copper	5000*
Lead	10*
Nickel	100*
Phosphorus	1
Selenium	100*
Zinc	1000*

**Superfund Amendments and Reauthorization Act of 1985 (SARA), Title III**

SECTION 311/312 HZARD CATAGORIES: Immediate Health Effect, Delayed Health Effect

This product contains the following EPCRA Section 313 chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right – to – Know Act of 1986 (40 CFR 372):

SECTION 313 REPORTABLE INGREDIENTS:

<b>Chemical Name</b>	<b>CAS Number</b>	<b>Concentration (% by weight)</b>	<b>Reportable</b>
Aluminum	7429-90-5	<0.05	No – Less than 1%
Antimony	7440-36-0	<0.9	No – Less than 1%
Arsenic	7440-38-2	<0.09	No – Less than 0.1%
Beryllium	7440-41-7	<0.09	No – Less than 0.1%
Cadmium	7440-43-9	<0.09	No – Less than 0.1%
Chromium	7440-47-3	0.01-1.0	Yes – Greater than 0.1%
Cobalt	7440-48-4	<0.09	No – Less than 0.1%
Copper	7440-50-8	<0.9	No – Less than 1%
Lead	7439-92-1	<0.05	Yes
Manganese	7439-96-5	02.-2	Yes – Greater than 1%
Nickel	7440-02-0	<1	Yes – Greater than 0.1%
Phosphorus	7723-14-0	<0.9	No – Less than 1%
Selenium	7782-49-2	<0.9	No – Less than 1%
Vanadium	7440-62-2	<0.9	No – Less than 1%
Zine	7440-66-6	0-0.1	No – Less than 1%

Concentrations based on analytical data and process knowledge of typical products reported by suppliers.

## **16. OTHER INFORMATION**

This SDS covers steel as delivered from a SPS facility but does not include chemicals that may be applied by subsequent handlers and/or distributors of this product. This could include a variety of material including oil, paints, galvanization, etc. that are not included in this SDS. Additionally, specialty orders may require application of coating material not listed in this SDS. SDSs for any coating will be provided separately on request. During welding, precautions should be taken for airborne contaminants that may originate from components if the welding rod. Arc or spark generated when welding or burning could be a source of ignition for combustible and/or flammable materials. The information in the SDS was obtained from sources which we believe are reliable; however, the information is provided without and representation of warranty, expressed or implied, regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, use, or disposal of this product.