



# Dunkirk Specialty Steel, LLC

PO Box 319, Dunkirk, New York 14048

Phone: 800-916-9133 / 716-366-1000 Fax: 716-366-0478

## Material Safety Data Sheet

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Stainless Steel  
Product Description: Wire, rod, bar, shaped products.

Manufacturing Location:  
Dunkirk Specialty Steel LLC.  
830 Brigham Road  
P.O. Box 319  
Dunkirk, New York 14048

Emergency Telephone Numbers: Health (716) 366-1000 or (800) 916-9133 (8:00 am - 5:00 pm EST M-F)

### 2. COMPOSITION/INFORMATION ON COMPONENTS

#### IMPORTANT!

This section covers materials that may be present in the steel article purchased. Dependent on customers' end-use, such as welding or grinding the metal, fumes, gases, and particulate may be generated; see Section 3 for possible contaminant exposure scenarios.

Component	(CAS No.)	wt. %	PEL (mg/m <sup>3</sup> )	TLV (mg/m <sup>3</sup> )	Supplemental Information
iron	(7439-89-6)	< 99.0	10	5	PEL for iron oxide/TLV for welding fume
chromium	(7440-47-3)	< 35.0	1	0.5	
nickel	(7440-02-0)	< 35.0	1	0.5	
manganese	(7439-96-5)	< 10.0	5 C	0.2	
molybdenum	(7439-98-7)	< 10.0	15	10	TLV for insoluble compounds
tungsten	(7440-33-7)	< 6.5	NL	5	TLV for insoluble compounds
cobalt	(7440-48-4)	< 4.5	0.1	0.02	
copper	(7440-50-8)	< 4.5	1	1	PEL/TLV for dust/mists.
			0.1	0.05	PEL/TLV for fumes.
vanadium	(7440-62-2)	< 4.5	0.5 C	0.05	PEL/TLV for respirable van. pentoxide
silicon	(7440-21-3)	< 2.5	15 (T)	10	
			5 (R)	-	
titanium	(7440-32-6)	< 2.5	15	10	PEL and TLV for titanium dioxide
aluminum	(7429-90-5)	< 2.0	15(T)	10	
			5 (R)	5	TLV as Aluminum in welding fume
carbon	(7440-44-0)	< 1.2	3.5	3.5	As carbon black
columbium	(7440-03-1)	< 1.1	NL	NL	
sulfur	(7704-34-9)	< 0.45	13	5.2	PEL and TLV for sulfur dioxide
phosphorus	(7723-14-0)	< 0.45	0.1	0.1	
tin	(7440-31-5)	< 0.05	2	2	PEL and TLV for inorganic tin
tantalum	(7440-25-7)	< 0.02	2	5	
boron	(7440-42-8)	< 0.01	15	10	PEL and TLV for boron oxide

Every material listed may not be present in all grades of steel. CAS Registry No. is representative for components listed.

PEL (mg/m<sup>3</sup>): 8-Hour Occupational Safety and Health Administration's (OSHA's) Permissible Exposure Limit (PEL) is milligrams per cubic meter of air (mg/m<sup>3</sup>)

TLV (mg/m<sup>3</sup>): 8-Hour American Conference of Governmental Industrial Hygienists (ACGIH's) Threshold Limit Value (TLV) in mg/m<sup>3</sup> - 1993-1994

C - Denotes ceiling limit/PEL for fume

T - Total particulate

R - Respirable fraction



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### 3. HAZARD IDENTIFICATION

#### Health Hazard Overview:

As shipped this product has no known toxicological properties. User generated dust and/or fumes can liberate hazardous contaminants when operations such as welding, brazing, grinding, cutting, etc. are performed.

The composition of the use generated dust and/or fumes will depend on how the user alters the product both mechanically and/or chemically. Thus it is the user's responsibility to assess potential generated contaminant exposures based on their processing of the product.

For informational purposes, outlined below are potential health effects of the metal components present. Liberation of these components and or potential concentrations is dependent on how the metal is altered by the user.

Additionally, when evaluating potential contaminant exposures, the product may have applied a metallic or non-metallic coating dependent on the customer's specifications. Material safety data sheets on the specific coating applied, if employed, are attached.

#### Potential Contaminant Exposures and Associated Health Effects

##### *welding fumes*

Welding fumes are defined as fumes generated by manual arc or oxy-acetylene welding of iron, mild steel, or aluminum. Excessive exposures to welding fumes can cause metal fume fever, which results from exposure to freshly formed metal fume. Symptoms are flu-like, including dyspnea, coughing, muscle pains, fevers, and chills. Exposure may also cause respiratory irritation. In addition, exposure to the particular metal (nickel, chromium, etc.) liberated may pose additional toxic effects.

##### *iron oxide*

Chronic exposure, usually six to ten years, to iron oxide dust/fume may result in siderosis, an accumulation of iron dust in the lungs. Siderosis is considered a benign condition and does not progress to a carcinogenic state.

##### *chromium*

The level of toxicity of chromium is dependent on its oxidation state (i.e., solubility). Chromium metal is relatively non-toxic. When the metal is heated to high temperatures, such as welding, fumes produced may be very toxic, especially to the lungs. Under these high temperatures, hexavalent chromium may be produced, which in its insoluble form is designated as confirmed human carcinogen (bronchogenic carcinoma). Other health effects include nasal irritation, and possible kidney and liver damage. Chromate dust may also cause skin ulcerations, dermatitis, and allergenic skin reactions.

##### *nickel*

Nickel metal is a cause of contact dermatitis in sensitized individuals. Based on a review of health data from exposed nickel refinery workers, the National Institute for Occupational Safety and Health (NIOSH) has reported that nickel metal and all inorganic nickel forms, when airborne, should be considered carcinogenic. The International Agency for Research on Cancer (IARC) has listed nickel compounds as carcinogenic to humans based on epidemiological and animal studies.



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### 3. HAZARD IDENTIFICATION (CONT.)

#### *manganese*

Acute exposures can result in metal fume fever. Chronic exposures effect the central nervous system, with early symptoms including languor, sleepiness, and weakness in the legs. Emotional disturbances and spastic gait with tendency to fall during walking are observed in more advanced cases.

#### *molybdenum*

Molybdenum compounds exhibit a low order of toxicity. Fumes from arcing molybdenum metal causes kidney and liver damage in experimental animals. Inhalation of high concentrations may be irritating to the respiratory tract.

#### *tungsten*

Insoluble tungsten at high concentrations during tungsten carbide machining may cause hard metal disease, accompanied by pulmonary fibrosis. The disease is characterized by cough, dyspnea, and wheezing, with a high incidence of minor radiological abnormalities.

#### *cobalt*

Potential symptoms to cobalt metal, fume, and dust, include cough, dyspnea, fibrosis, and respiratory hypersensitivity. Cobalt liberation during tungsten carbide machining is also associated with hard metal pneumoconiosis, and the development of hypersensitivity asthma in some workers. Repeated skin contact can cause sensitivity and allergenic skin rashes. Animals injected with cobalt powders developed carcinogenic tumors.

#### *copper*

Copper itself probably has little or no known toxicity, although there are conflicting reports in the literature. Fumes and dust may be irritating to the upper respiratory tract and, as a sublimed oxide, may be responsible for metal fume fever.

#### *vanadium*

Vanadium itself is considered nontoxic; however, during smelting or refining, the oxides of vanadium are toxic. Vanadium pentoxide exposure is associated with eye, skin, and respiratory irritation, conjunctivitis, and pulmonary damage.

#### *silicon*

Elemental silicon is an inert material which appears to lack the property of causing fibrosis in lung tissue.

#### *titanium*

Titanium and several of its compounds are considered to pose extremely low toxicity. Most of the available studies suggest that inhaled titanium dioxide is biologically inert.

#### *aluminum*

Aluminum powder is an eye, skin and respiratory irritant. Exposures to finely divided aluminum powder have been reported to cause pulmonary fibrosis with encephalopathy. Fumes associated with aluminum soldering flux have been reported to result in a delayed type of asthma. May be implicated in Parkinson's disease.



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### 3. HAZARD IDENTIFICATION (CONT.)

#### *carbon*

Elemental carbon, as it exists in this product, is of low toxicity. The health hazard data contained in this MSDS is based on exposure to carbon black, not carbon as it is present in this product. Chronic inhalation of carbon black may result in temporary or permanent damage to the heart and lungs. Epidermal exposure may lead to inflammation of hair follicles and oral mucosal lesions. Pneumoconiosis may also occur as a result of chronic exposure to carbon black .

#### *columbium*

No health information found in literature search.

#### *sulfur*

Symptoms of inhalation include respiratory irritation, sneezing and coughing. Sulfur is irritating to skin; repeated contact may induce allergenic response. Sulfur is an eye irritant. Chronic exposure to sulfur dioxide may cause permanent pulmonary impairment, which is caused by repeated episodes of bronchoconstriction. Sulfur dioxide is also extremely irritating to the respiratory tract and eyes.

#### *phosphorus*

Phosphorus causes thermal and chemical burns on skin contact and will be absorbed by the skin. Phosphorus is highly toxic, associated with bone destruction and anemia. Ocular irritation and damage is associated with white phosphorus fumes.

#### *tin*

Exposures to dust or fumes of tin is known to cause stannosis, a benign pneumoconiosis. The condition is characterized by no distinctive fibrosis, no evidence of disability, and no special complicating factors.

#### *tantalum*

The toxicity of metallic tantalum is low, probably due to its poor solubility.

#### *boron*

Elemental boron is not considered a poison. Boric acid and boron derivatives, when ingested or absorbed through the skin or mucous membranes for long periods, causes anorexia, vomiting, skin rash, convulsions, and anemia.



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### 4. FIRST AID MEASURES

As shipped, the likelihood for hazardous consequences through inhalation, skin or eye contact, or ingestion is considered to be minimal. The following measures are for exposures to dust or fumes.

**Inhalation:**

Remove from exposure. If breathing difficulty occurs, or coughing persists, get prompt medical attention.

**Skin/Eye Contact:**

Flush eyes with plenty of water for at least 15 minutes. If irritation persists, seek medical attention. Wash skin with soap and water to remove metallic particles. If a rash develops, seek medical attention.

**Ingestion:**

Seek medical attention.

### 5. FIRE FIGHTING MEASURES

Flashpoint and Method :Not applicable

Flammable Limits :Not applicable

Autoignition Temperature :Not available

**General Hazard:**

In the form shipped, these specialty metals are not combustible. Note: Special care may be required for fire fighting the metal, if reduced to particulates (dust).

Fire Fighting Instructions: No special equipment for product as shipped.

Fire Fighting Equipment: No special equipment for product as shipped.

**Hazardous Combustion Products:**

In the form shipped, hazardous decomposition products are not expected.

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### 6. ACCIDENTAL RELEASE MEASURES

Land/Water Spill: As shipped this product does not pose a hazard to the environment.

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### 7. HANDLING AND STORAGE

Storage Temperature: Not applicable. Storage Pressure: Not Applicable.

General: Store material away from incompatible materials (see Section 10).

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### 8. EXPOSURE CONTROL/PERSONAL PROTECTION

**Engineering Controls:**

The use of local exhaust ventilation is recommended to control emissions near the source of where the metal is being altered (i.e., welding, grinding, etc.).

**Personal Protection:**

When handling the product, leather gloves are recommended.

Wear appropriate personal protective equipment based on operations performed, such as safety glasses with side shields, when grinding or sawing the product.

Based on your processing of the product, if industrial hygiene monitoring reveals overexposures, refer to Section 2 for exposure limit values. Engineering controls are required to reduce exposures below mandated exposure limits (OSHA PELs). In the absence of feasible engineering controls, or in the interim of implementing engineering controls, wear a NIOSH approved respirator for the protection from particulates (high efficiency particulate absolute (HEPA) filter cartridge). Respiratory selection should be chosen in accordance with NIOSH's Respirator Decision Logic Publication No. 87-108.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure	: Not applicable	Vapor Density (Air = 1)	: Not applicable
Specific Gravity (H2O = 1)	: 7.5 - 8.5	Evaporation Rate	: Not applicable
Solubility in Water	: insoluble	Freezing Point	: Not applicable
pH	: Not applicable	Odor	: odorless
Boiling Point	: Not applicable	Appearance	: gray in color
Viscosity	: Not applicable	Physical State	: solid

### 10. STABILITY AND REACTIVITY

**General:** As shipped, this product is stable and hazardous polymerization will not occur.

**Incompatible Materials and Conditions to Avoid:** Acids, bases, and oxidizers.

**Hazardous Decomposition:** None for product as shipped.

### 11. DISPOSAL CONSIDERATIONS

**General:**

Consult an expert on the disposal of recovered material. Ensure disposal is in compliance with governmental requirements and ensure conformity to federal, state, and local regulations.

Remember, scrap metal can be recycled.



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### 12. TRANSPORT INFORMATION

DOT (Department of Transportation):

Proper Shipping Name :Not applicable  
Hazardous Class :Not applicable  
Identification Number :Not applicable

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### 13. REGULATORY INFORMATION

TSCA (Toxic Substances Control Act): Not applicable.

CERCLA (Comprehensive Response Compensation, and Liability Act): Not applicable.

SARA Title III (Superfund Amendments and Reauthorization Act):

311/312 Hazardous Categories:

Not applicable for storage of item as shipped; however, if processed, user end-product may require reporting.

313 Reportable Ingredients:

Chromium, nickel, manganese, cobalt, copper, vanadium, aluminum, and phosphorus.

CARCINOGENICITY (OSHA, HAZARD COMMUNICATION)

NTP (National Toxicology Program): Not applicable.

IARC (International Agency for Research on Cancer): Not applicable.

OTHER: Not applicable.

Note: Dependent on customer's end-use, components may be liberated that may be carcinogenic (refer to Section 3).

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### 14. OTHER INFORMATION

THE INFORMATION RELATES TO THIS SPECIFIC MATERIAL. IT MAY NOT BE VALID FOR THIS MATERIAL IF USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY ONESELF AS TO THE SUITABILITY AND COMPLETENESS OF THIS INFORMATION FOR HIS/HER OWN PARTICULAR USE.

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