



## MATERIAL SAFETY DATA SHEET

Manufacturer Name: Trade Name & Synonyms: Chemical Name:	Brand X Metals, Inc. Stainless Steel AISI/SAE Grades 300 Series, 400 Series
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### Section I – PRODUCT INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits OSHA PEL		Exposure Limits 8hr TWA		NTP Listed	IARC Listed
			DUST	FUME	DUST	FUME		
<b>Base Metal</b> Iron (Fe)	7439-89-6	83.0 - 86.5	----	10	----	5	NO	NO
<b>Alloying Elements</b>								
Aluminum (Al)	7429-90-5	0.1 – 0.5	15	----	10	5	NO	NO
Carbon (C)	7440-44-0	10 – 1.5	NA	NA	3.5	----	NO	NO
Chromium (Cr)	7440-47-3	10 - 27	10	----	----	5	YES	YES
Cobalt (Co)	7440-48-4	.01 - 75	1	----	----	0.5	NO	NO
Columbium (Cb)	7440-03-1	.01 - .10	NA	NA	NA	NA	NO	NO
Copper (Cu)	7440-50-8	18 – 4.5	1.0	1	1.0	2	YES	NO
Manganese (Mn)	7439-96-5	2 - 10	5	5	5	15	NO	NO
Molybdenum (Mo)	7439-98-7	.04 - 5	15	----	15	----	NO	NO
Nickel (Ni)	7440-02-0	12-34	1	----	1	----	YES	YES
Phosphorus (P)	7723-14-0	01 - 06	1	----	.1	----	NO	NO
Selenium (Se)	7782-49-2	01 – 0.3	2	----	2	----	NO	NO
Silicon (Si)	7440-21-3	15 – 2.0	15	----	10	----	NO	NO
Sulfur (S)	7704-34-9	01 - 06	----	15	----	5	NO	NO
Tantalum (Ta)	7440-25-7	01 - 10	5.0	----	5.0	----	NO	NO
Titanium (Ti)	7440-32-6	01 – 0.70	----	15	----	10	NO	NO

NOTE: The above listing is a summary of elements in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts. No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel. Values are applicable to component elements.

### Section II. PHYSICAL DATA

Material is <b>SOLID</b> at 'Normal Conditions'	Appearance and odor Grey-Black, Odorless	% Volatile by Volume N/A	Vapor Density N/A
Acidity / Alkalinity pH = N/A	Melting Point Approx. 2400-2800 F Boiling Point = N/A	Specific Gravity (H2O=1) Approx. 8	Vapor Pressure (MM Hg @ 20 C) N/A

### Section III – PERSONAL PROTECTIVE EQUIPMENT

<b>RESPIRATORY PROTECTION:</b> Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particulates. If exposure limits are reached or exceeded, use NIOSH approved equipment.	<b>HANDS, ARMS and BODY:</b> Protective gloves should be worn as required for welding, burning or handling operations.
<b>EYES and FACE:</b> Safety glasses should be worn when grinding or cutting. Face shields should be worn when welding, cutting or burning.	<b>OTHER CLOTHING and EQUIPMENT:</b> As required depending on operations and safety codes.

### Section IV – EMERGENCY MEDICAL PROCEDURES

<b>INHALATION:</b>	Remove to fresh air; if condition continues, consult a physician
<b>EYE CONTACT:</b>	Flush thoroughly with running water to remove particulate; obtain medical attention
<b>SKIN CONTACT:</b>	Remove particulates by washing thoroughly with soap and water. Seek medical attention if condition persists
<b>INGESTION:</b>	If significant amounts of metal are ingested, consult physician



**Section V – HEALTH/SAFTEY INFORMATION**

Stainless steel products in their normal state present no inhalation, ingestion or health hazard. Operations such as burning, welding, sawing, brazing, grinding and machining which result in elevated temperatures of the product to, or above its melting point, or result in the generation of airborne particulates may present hazards. The major exposure hazard is inhalation. Effects or overexposure to fume and dust are as follows:

**ACUTE:** Excessive inhalation of metallic fumes and dust may result in irritation of eyes, nose and throat. High concentrations of fumes and dust of iron-oxide, manganese, copper, zinc and lead may result in metal fume fever. Typical symptoms last from 12 to 48 hours and consist of a metallic taste in mouth, dryness and irritation of the throat chills and fever.

**CHRONIC:** Chronic and prolonged inhalation of metallic fumes or dust of the following elements may lead to the conditions listed opposite the element:

- Aluminum: Irritation of the eyes, nose, throat
- Chromium: Lesions of the skin and mucous membranes, possible cancer of the nose or lungs-bronchogenic carcinoma
- Cobalt: Respiratory tract irritation, skin rash
- Copper: Irritation of the eyes, nose and throat, metal fume fever
- Iron: Siderosis, pulmonary effects
- Manganese: Bronchitis, pneumonitis, lack of coordination
- Molybdenum: Respiratory tract irritation, possible liver and kidney damage, bone deformity
- Nickel: Lesions of the skin and mucous membranes, possible cancer of the nose or lungs-branchogenic carcinoma
- Phosphorous: Necrosis of the mandible
- Selenium: Nasal and bronchial irritation, gastrointestinal disturbances, garlic breath odor
- Sulfur: (as sulfur dioxide) Edema of the lungs
- Titanium: No chronic debilitating symptoms indicated
- Columbium/Tantalum: No chronic debilitating symptoms indicated

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Individuals with chronic respiratory disorders (i.e. asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure.

**OCCUPATIONAL EXPOSURE LIMITS:** See Product Ingredients. Chromium and Nickel have been identified by the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) as potential cancer causing agents.

Flash Point = N/A	Auto Ignition Temperature = N/A	Flammable Limits in Air = N/A	Extinguishing Media = For molten aluminum use dry powder or sand
Fire and Explosion Hazards: Stainless products do not present fire or explosion hazards under normal conditions. Fine metal particles such as products in grinding or sawing can burn. High concentrations of metallic fines in the air may present an explosion hazard.		<b>EXTINGUISHING MEDIA NOT TO BE USED</b> Do not use water on molten metal or fires caused by fine metal particles.	
<b>STABILITY</b> (X) Stable ( ) Unstable		<b>INCOMPATIBILITY (MATERIALS TO AVOID)</b> Reacts with strong acids to form hydrogen gas	
<b>CONDITIONS TO AVOID:</b> Stainless steel at temperatures above the melting point may liberate fume containing oxides of iron and alloying elements.			

**HAZARDOUS DECOMPOSITION PRODUCTS:** Metallic dust of fumes may be produced during welding, burning grinding and possibly machining. Refer to ANSI Z49.1

**Section VI – ENVIRONMENTAL**

**SPILL OR LEAK PROCEDURES**

Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for re-use.

**WASTE DISPOSAL METHOD\***

Used or unused products should be disposed of in accordance with Federal, State or Local Laws and Regulations.

\*Disposer must comply with Federal, State and Local disposal or discharge laws.

**Section VII – ADDITIONAL INFORMATION**

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod. Arc or spark generated when welding or burning could be a source of ignition for combustion and flammable materials.

**DISCLAIMER**

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