MSDS (Material Safety Data Sheet)

Information on Products Distributed and/or Manufactured by Alaskan Copper Works, Alaskan Copper & Brass Company or Stainless Piping Systems, Inc.

ALASKAN

CAUTION

DUST FUMES MIST

MAY BE HAZARDOUS TO YOUR HEALTH DURING CERTAIN MANUFACTURING PROCEDURES

WEAR
RESPIRATORS/GLOVES/SAFETY GLASSES
USE ADEQUATE VENTILATION
AS REQUIRED
SEE MSDS FILE FOR SPECIFIC SAFETY PRECAUTIONS BEFORE HANDLING

This information and data is being provided on the following pages as required by the Office of Health Compliance Assistance (OSHA) Hazard Communication Standard (HCS), 29 CFR 1910.1200), State of Washington, HCS WAC 296-62-054 through WAC 296-62-05425 and Oregon Occupational Safety and Health Code, Oregon Administrative Rules (OAR) Chapter 435, Division 155. The products manufactured by and distributed by ALASKAN do not, in and of themselves, constitute a hazardous material under these regulations. However, some of the elements contained in these products have been determined to be hazardous by OSHA. These can only be released through certain manufacturing procedures such as burning, melting, welding, sawing, brazing, grinding and machining.

In compliance with these regulations, we are providing you with a summary MSDS for all of our products you currently use or might use in the future.

While the information contained herein is believed to be correct, no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment to store, handle, or process the materials. Hazards connected with the use of the material are solely the responsibility of the user.

Last Updated: February 3, 2003

Chemical Analysis

Stainless Steel Wrought Alloys

Type	UNS Desig-nation	ASTM Mat'l Spec	Carbon % Max	Manga-nese % Max	Phos-phorus % Max	Sulfur % Max	Silicon % Max	Molyb-denum %	Chrom-ium* %	Nickel * %	Other Elements %
304	S30400	A 240	.08	2.0	.045	0.03	1.0		18.0-20.0	8.0-10.5	N .10 max
304L	S30403	A 240	.03	2.0	.045	0.03	1.0		18.0-20.0	8.0-12.0	N .10 max
304H	S30409	A 240	.04-.10	2.0	.045	0.03	1.0		18.0-20.0	8.0-10.5	
309S	S30908	A 240	.08	2.0	.045	0.03	1.0		22.0-24.0	12.0-15.0	
310S	S31008	A 240	.08	2.0	.045	0.03	1.5		24.0-26.0	19.0-22.0	
316	S31600	A 240	.08	2.0	.045	0.03	1.0	2.0-3.0	16.0-18.0	10.0-14.0	N .10 max
316L	S31603	A 240	.03	2.0	.045	0.03	1.0	2.0-3.0	16.0-18.0	10.0-14.0	N .10 max
316H	S31609	A 240	.04-.10	2.0	.045	0.03	1.0	2.0-3.0	16.0-18.0	10.0-14.0	
317	S31700	A 240	.08	2.0	.045	0.03	1.0	3.0-4.0	18.0-20.0	11.0-15.0	N .10 max
317L	S31703	A 240	.03	2.0	.045	0.03	1.0	3.0-4.0	18.0-20.0	11.0-15.0	N .10 max
321	S32100	A 240	.08	2.0	.045	0.03	1.0		17.0-19.0	9.0-12.0	Ti=5 x C to .7
321H	S32109	A 240	.04-.10	2.0	.045	0.03	1.0		17.0-19.0	9.0-12.0	Ti=4 x C to .7
347	S34700	A 240	.08	2.0	.045	0.03	1.0		17.0-19.0	9.0-13.0	Cb+Ta=10 x C to 1.1
347H	S34709	A 240	.04-.10	2.0	.045	0.03	1.0		17.0-19.0	9.0-13.0	Cb+Ta=8 x C to 1.0
**	S31803	A 240	.03	2.0	.030	0.02	1.0	2.5-3.5	21.0-23.0	4.5-6.5	N .08-.20
***	S32550	A 240	.04	1.5	.040	0.03	1.0	2.0-4.0	24.0-27.0	4.5-6.5	Cu 1.5-2.5 N .10-.25
254SMO	S31254	A 240	.020	.020-1.0	.030	.01	.80	6.0-6.5	19.5-20.5	17.5-18.5	Cu 0.5-1.0 N 0.18-.22
AL-6XN	N08367	B 688	.030	2.0	.040	.03	1.0	6.0-7.0	20.0-22.0	23.5-25.5	Cu 0.75-max N 0.18-.25

Stainless Steel Cast Alloys

A.C.I.[1] Type	Wrought Equivalent	Carbon % Max	Manganese % Max	Phosphorus % Max	Sulfur %Max	Silicon % Max	Chronmium* %	Nickel* %	Other Elements %
CF-8	304	.08	1.5	.04	.04	2.0	18.0-21.0	8.0-11.0	Mo .50 max
CF-3	304L	.03	1.5	.04	.04	2.0	17.0-21.0	8.0-12.0	Mo .50 max
CH-20	309	.20	1.5	.04	.04	2.0	22.0-26.0	12.0-15.0	Mo .50 max
CK-20	310	.20	1.5	.04	.04	1.75	23.0-27.0	19.0-22.0	Mo .50 max
CF-8M	316	.08	1.5	.04	.04	1.5	18.0-21.0	9.0-12.0	Mo 2.0-3.0
CF-3M	316L	.03	1.5	.04	.04	1.5	17.0-21.0	9.0-13.0	Mo 2.0-3.0
CG-8M	317	.08	1.5	.04	.04	1.5	18.0-21.0	9.0-13.0	Mo 3.0-4.0
****	317L	.03	1.5	.04	.04	1.5	18.0-21.0	9.0-13.0	Mo 3.0-4.0
CF-8C	347	.08	1.5	.04	.04	2.0	18.0-21.0	9.0-12.0	Cb= 8 x C to 1.0
CN-7M	20CB	.07	1.5	.04	.04	1.5	19.0-22.0	27.5-30.5	Mo 2.0 to 3.0 Cu 3.0 to 4.0

Aluminum Wrought Alloys

Alloy	UNS Desig-nation	ASTM Mat'l Spec	Manganese % Max	Magnesium %	Iron % Max	Zinc % Max	Silicon % Max	Titanium % Max	Copper % Max	Chromium* %	Aluminum %
3003	A93003	B 209	1.0-1.5		.70	.10	.6		.05-.20		r
5052	A95052	B 209	.1	2.2-2.8	.40	1.0	.25		.10	.15-.35	r
5083	A95083	B 209	.40-1.0	4.0-4.9	.40	.25	.40	.15	.10	.05-.25	r
5086	A95086	B 209	.20-.7	3.5-4.5	.50	.25	.40	.15	.10	.05-.25	r
6061	A96061	B 209	.15	.80-1.2	.70	.25	.40-.8	.15	.15-.40	.04-.35	r

[1] Formerly Alloy Casting Institute, now called Steel Founders Society of America

** Items with a single * are suspected carcinogens in humans: see Pages 4 -6 for detailed information.*

***Commonly referred to as Al 2205™*

**** Commonly referred to as Ferralium 255®*

***** Not an ACI alloy, but frequently identified as CG-3M*

r = remainder

Note: Chemistry for wrought alloys is for sheet and plate only. Similar material specifications apply to other forms.

Nickel Base Wrought Alloys

Symbol[1] and Grade	UNS Desig-nation	ASTM Mat'l Spec	Carbon % Max	Manga-nese % Max	Phos-phorus % Max	Copper % Max	Iron % Max	Molyb-denum %	Chrom-ium* %	Nickel* %	Other Elements % Max
N (200)	N02200	B 162	.15	.35		.25	.40			99.0 min	Si .35 S .01
NL (201)	N02201	B 162	.02	.35		.25	.40			99.0 min	Si .35 S .01
NC (400)	N04400	B 127	.30	2.0		28.0-34.0	2.5			63.0 min	Si .5 S .024
NC1 (600)	N06600	B 168	.15	1.0		.50	6.0-10.0		14.0-17.0	72.0 min	Si .5 S .015
NIC (800)	N08800	B 409	.10	1.5		.75	39.5 min		19.0-23.0	30.0-35.0	Si 1.0 S .015 Ti .15-.60 Al .15-.60
330 (RA 330)	N08330	B 536	.10	2.0	.030	1.0	r		17.0-20.0	34.0-37.0	Si .75-1.5 S .03 Pb* .005 Sn .025
NICMC (825)	N08825	B 424	.05	1.0		1.5 - 3.0	22.0 min	2.5-3.5	19.5-23.5	38.0-46.0	Si .5 S .03 Al .2 Ti .6-1.2
20CB	N08020	B 463	.07	2.0	.045	3.0-4.0	r	2.0-3.0	19.0-21.0	32.0-38.0	Si 1.0 S .035 Cb+Ta 8 x C to1.0
HB-2 (Hast B-2)	N10665	B 333	.02	1.0	.040		2.0	26.0-30.0	1.0	r	Si .10 S .03 Co 1.0
HC276 (Hast C-276)	N10276	B 575	.02	1.0	.040		4.0-7.0	15.0-17.0	14.5-16.5	r	Si .08 S .03 Co 2.5 V .35 W 3.0-4.5
HC4 (Hast C-4)	N06455	B 575	.015	1.0	.040	1.5-2.5	8.0-21.0	6.0-8.0	21.0-23.5	r	Si 1.0 S .03 Co .2 W .5 V .5 B .01 Al+Ti .5
HN (Hast N)	N10003	B 434	.04-.08	1.0	.015	.35	5.0	15.0-18.0	6.0-8.0	r	Si 1.0 S .02 Co .2 W .5 V .5 B .01 Al+Ti .5
HX (Hast X)	N06002	B 435	.05-.15	1.0	.040		17.0-20.0	8.0-10.0	20.5-23.0	r	Si 1.0 S .03 Co.5-2.5 W.2-1.0
NCMC (625)	N06625	B 443	.10	.50	.015		5.0	8.0-10.0	20.0-23.0	58.0 min	Si .5 S .15 Co 1.0 (if determined) Al .4 Ti .4 Cb+Ta 3.15-4.15
904L	N08904	B 625	.020	2.0	.045	1.0-2.0	r	4.0-5.0	19.0-23.0	23.0-28.0	Si 1.0 S .035

[1]As listed in ASTM B 366, Table 1 (except Alloy 904L)

Titanium Wrought Alloys

Grade	ASTM Mat'l Spec	Nitrogen % Max	Carbon % Max	Hydrogen % Max	Iron % Max	Oxygen % Max	Titanium %	Residuals (each) % Max	Residuals (total) % Max	Other Elements %
Grade 1	B 265	.03	.10	.015	.20	.18	r	.10	.40	
Grade 2	B 265	.03	.10	.015	.30	.25	r	.10	.40	
Grade 3	B 265	.05	.10	.015	.30	.35	r	.10	.40	
Grade 4	B 265	.05	.10	.015	.50	.40	r	.10	.40	
Grade 5	B 265	.05	.10	.015	.40	.20	r	.10	.40	Al 5.5-6.75 V 3.5-4.5
Grade 6	B 265	.05	.10	.020	.50	.20	r	.10	.40	Al 4.0-6.0 Sn 2.0-3.0
Grade 7	B 265	.03	.10	.015	.30	.25	r	.10	.40	Pd* .12-.25
Grade 10	B 265	.05	.10	.020	.35	.18	r	.10	.40	Sn 3.75-5.25 Mo 10.0-13.0 Zr 4.5-7.5
Grade 11	B 265	.03	.10	.015	.20	.18	r	.10	.40	Pd* .12-.25
Grade 12	B 265	.03	.08	.015	.30	.25	r	.10	.40	Mo .2-.4 Ni .6-.9

r = remainder

Note: Chemistry for wrought alloys is for sheet and plate only. Similar material specifications apply to other forms.
** Items with a single * are suspected carcinogens in humans: see Pages 4 -6 for detailed information.*

Chemical Analysis

Copper Alloys[1]

UNS Designation	Common Name	Copper %	Nickel %	Lead* %	Manganese %	Tin %	Phosphorus %	Arsenic* %	Tellurium %	Zirconium %	Silicon %	Cobalt %	Beryllium* %
C10100	Oxygen Free Electronic	99.99+					.0003		.0010				
C10200	Oxygen Free	99.95+											
C10300	OFXLP	99.95+											
C11000	Electrolytic Tough Pitch	99.99+											
C12000	Phosphorus Deoxidized	99.9+					.008						
C12200	Phosphorus Deoxidized	98.98					.020						
C14500	Tellurium Bearing	99.49					.010		.50				
C17200	Beryllium Copper	98.1+	**									.25	1.85
C17300	Beryllium Copper	97.7+	.25	.30									1.85
C17500	Beryllium Copper	96.9+	**									2.5	.50

**May be substituted for cobalt

Copper-Based Alloys[1]

UNS Designation	Common Name	Copper %	Zinc %	Lead* %	Manganese %	Tin %	Phosphorus %	Arsenic* %	Tellurium %	Nickel* %	Silicon %	Iron %	Aluminum %
C22000	Commercial Bronze	90.00	10.0										
C23000	Red Brass, 85%	85.00	15.0										
C24000	Low Brass, 80%	80.00	20.0										
C26000	Cartridge Brass	70.00	30.0										
C27000	Yellow Brass, 70%	65.00	35.0										
C27200	Yellow Brass, 63%	63.00	37.0										
C27400	Yellow Brass, 62%	62.00	38.0										
C31400	Leaded Commercial Bronze	89.00	9.1	1.90									
C33000	Low Leaded Brass (Tube)	66.50	33.0	.50									
C34900	Low Leaded Brass (Tube)	66.29	37.5	.30									
C35600	Extra High Leaded Brass	62.50	35.0	2.50									
C36000	Free Cutting Brass	61.50	35.3	3.25									
C38500	Architectural Bronze	57.00	40.0	3.00									
C44300	Admiralty, Arsenical	71.00	27.96			1.0		.040					
C46400	Naval Brass, Uninhibited	60.00	39.25			.75							
C48200	Naval Brass, High Leaded	60.00	38.55	.70		.75							
C51000	Phosphor Bronze, 5% A	94.80				5.0	.20						
C51100	Phosphor Bronze	95.60				4.2	.20						
C61400	Aluminum Bronze	90.25										2.75	7.00
C63000	Aluminum-Nickel Bronze	82.00			1.0					5.0		2.50	9.50
C64200	Aluminum-Silicon Bronze	90.75									1.85		6.95
C65100	Low Silicon Bronze B	98.25			.25						1.50		
C65500	High Silicon Bronze A	95.80			1.1						3.10		
C67500	Manganese Bronze A	58.50	39.25		.25	1.0						1.00	
C70600	90-10 Copper-Nickel	88.35			.40					10.0		1.25	
C71500	70-30 Copper-Nickel	68.90			.60					30.0		.50	
C75200	18% Spring Nickel Silver	64.50	17.25		.25					18.0			
C90300	Tin Bronze	87.50	4.00	.30		8.25				1.0		.20	
C93200	SAE 660 Bearing Bronze	83.00	3.00	7.00		7.00							
C95400	Aluminum Bronze (Armco 18™)	83.50			.50						1.50		10.50

[1]*Nominal Composition is listed.*

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Health Hazard Information

The below listed ingredients have been determined to be a health hazard at 1% or greater of the composition or in the case of carcinogens (noted with *) at .1% of the composition. See previous pages for chemical analysis of products.
Inhalation of dust and/or fume is the primary method of entry.

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INGREDIENTS	CAS NO.	OSHA TWA[1]	ACGIH TLV-TWA[1]	ACGIH TLV-STEL[1]
Aluminum (Al)	7429-90-5	15 Dust/5 Fume	10 Dust/5 Fume	
Aluminum Coating	7429-90-5	15 Dust/5 Fume	10 Dust/5 Fume	
*Antimony (Sb)	7440-36-0	0.5 Dust & Fume	0.5 Dust & Fume	
*Arsenic (As)[2]	7440-38-2	10 µg Inorganic	0.01 Dust & Fume	
*Beryllium (Be)[2]	7440-41-7	2 µg Compounds	0.002 Dust & Fume	
Bismuth (Bi)	7440-69-9	Not Established	Not Established	
Boron (B)	7440-42-8	10 Oxide Dust	10 Oxide Fume	
*Cadmium(Cd)[3]	7440-43-9	0.1 Fume .3 CL	0.05 Dust & Fume	
Carbon (C)	7440-44-0	Not Established	Not Established	
*Chromium (Cr)	7440-47-3	1.0 Chrome Metal	0.5 Chrome Metal & Compounds	
Cobalt(Co)	7440-48-4	0.05 Dust & Fume	0.05 Dust & Fume	
Columbium (Cb)	7440-03-1	5 Dust & Fume	5 Dust & Fume	
Copper (Cu)	7440-50-8	1.0 Dust & Mists/0.1 Fume	1.0 Dust & Mists/0.2 Fume	
Iron (Fe)	7439-89-6	10 Oxide Fume	5 Oxide Fume	
*Lead (Pb)[2]	7439-92-1	0.05 Inorganic	0.05 Dust & Fume	
Magnesium	1309-48-4	10 Total Particulate	6 Oxide Fume	
Manganese (Mn)[3]	7439-96-5	1 Fume/5 CL Compounds	5 Dust/1 Fume	3 Fume
Molybdenum (Mo)	7439-98-7	10 Total Dust	10 Insoluble Compounds	
*Nickel (Ni)	7440-02-0	1 Nickel Metal	0.05 Nickel Metal	
Phosphorous (P)	7723-14-0	0.1 Phosphorus	0.1 Phosphorus	
Selenium (Se)	7782-49-2	0.2 Metals & Compounds	0.2 Metals & Compounds	
Silicon (Si)	7440-21-3	10 Total Dust	10 Total Dust	
Silver (Ag)	7440-22-4	0.01 Silver Metal	0.01 Silver Metal	
Sulfur (S)	7704-34-9	5 Sulfur Dioxide	5.2 Sulfur Dioxide Dust/2 Fume	13/5 SO_2 Dust/Fume
Tantalum(Ta)	7440-25-7	5.0 Metal Dust Oxide	5.0 Metal Dust Oxide	
Tellurium(Te)	13494-80-9	0.1 Tellurium	0.1 Tellurium	
Tin(Sn)	7440-31-5	2 Inorganic Compounds	2 Tin Metal	4 Tin Metal
Titanium(Ti)	7440-32-6	10 Total Dust	10 Titanium Dioxide	
Tungsten(W)	7440-33-7	1 Soluble/5 Insoluble	1 Soluble/5 Insoluble Compounds	
Vanadium (V)	7440-62-2	0.01 Dust & Fume	0.01 Dust & Fume	
Zinc	7440-66-6	10 Oxide Dust	10 Dust/5 Fume	10 Fume
Zirconium (Zr)	7440-67-7	5 Zirconium Compounds	5 Zirconium & Compounds	10 Zirconium

[1]Allowable concentrations are expressed in milligrams per cubic meter of air, unless noted
[2]µg = microgram (one millionth of a gram; 10^{-6} gram)
[3]CL = ceiling limit

Aluminum: Excessive exposure to aluminum fume and dust has been associated with lung disease, however this effect may be due to simultaneous silica exposure.

***Antimony:** May cause irritation to the skin and mucous membranes. Symptoms include metallic taste in the mouth, vomiting, colic, loss of appetite and weight, and diarrhea. In acute poisoning there may be death from circulatory or respiratory failure or toxic hepatitis. A skin/contact dermatitis may result which starts as an inflammation of the hair follicles and can progress through pus formation and sloughing to leave a contracted scar.

***Arsenic:** Excessive exposure to airborne concentrations of inorganic compounds may cause lung cancer. May cause irritation to the skin and mucous membranes. Gastrointestinal, nervous system, kidney and liver disorders have been reported in acute or chronic overexposures. Depression of bone marrow may also occur. Ingestion is harmful and may cause nausea, vomiting, paralysis, gastrointestinal irritation and may be fatal.

**Items with a single * are suspected carcinogens in humans. See Pages 4-6 for detailed information.*

Health Hazard Information

***Beryllium:** Airborne particles of beryllium alloys can cause irreversible lung damage and result in an acute or chronic systemic disease called berylliosis. Symptoms include a relatively non-productive cough, progressive difficulty in breathing, fatigue after slight exertion, loss of appetite and weight. The acute form symptoms appear in several hours to several weeks with a usually rapid progression of signs including anorexia, dyspnea, and heart disease. Chronic symptoms are usually delayed in their onset and persistent in nature and can be triggered or aggravated by stresses, such as pregnancy, respiratory infection, and thyrotoxicosis. Granulomatous lesions of the skin, liver, kidneys, spleen and lymph nodes have been reported. Beryllium is also suspected to be a human carcinogen and has caused cancer in laboratory animals.

***Cadmium:** Inhalation of fumes may cause respiratory irritation with a sore, dry throat and a metallic taste followed by a cough, chest pain, and difficulty in breathing. Bronchitis, pneumonitis and pulmonary edema, headaches, dizziness, loss of weight and appetite have also been reported. The liver, kidneys and bone marrow may be injured by the presence of the metal. Continued exposure to lower levels of cadmium may result in irreversible lung and kidney damage. Single high level exposure can cause severe and possibly fatal lung irritation. Cadmium is also a suspected human carcinogen.

***Chromium:** May act as an allergen and cause a dermatitis and/or produce a pulmonary sensitization. Chromic acid and chromates have a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract. The International Agency for Research on Cancer (IARC) has determined that there is a significant increase in lung cancer. This finding is supported by animal studies.

***Cobalt:** Cobalt has been reported as causing hypersensitization type dermatitis in some individuals. Excessive and prolonged overexposure of cobalt may cause an asthma-like disease with cough and dyspnea.

Copper: Dust and fumes from melting, grinding and cutting may present a potential health hazard. Fumes may cause a metal fume fever with flu-like symptoms and damage or ulceration of the nasal passages. There may also be skin and hair discoloration. Dermatitis due to sensitization may occur in some individuals.

Iron: The inhalation of iron oxide fumes or dust may cause an apparent benign pneumoconiosis which is called siderosis. Shortness of breath and coughing are common.

***Lead:** Lead is an accumulative poison. Short term exposure symptoms may include stomach cramps, fatigue, constipation, and decreasing appetite. Inhalation of large amounts of lead may lead to seizures, coma, and death. Long term exposure symptoms are nausea, vomiting, severe anemia, paralysis of the wrist joint and kidney damage. Exposure can result in decreased fertility and/or increased chances of miscarriage or birth defects.

Magnesium: Heavy exposure to fume may be irritating to eyes, nose and throat and cause metal fume fever.

Manganese: Manganese poisoning is not fatal although it is extremely disabling. Prolonged exposure can affect the central nervous system. A fever and chills may be typical symptoms.

***Nickel:** Often causes allergic dermatitis know as “nickel itch”. Inhalation can cause hypertrophic rhinitis and nasal sinusitis. In extreme cases it is suspected of causing cancer of the nasal cavities, lungs and other organs.

Silicon: May be responsible for benign pneumoconiosis, but is not considered to be dangerous in the cold state.

Tin: Tin fume or dust is moderately irritating to the eyes and airways and may cause an apparent benign pneumoconiosis called stannosis which is not disabling.

Zinc: Even as an oxide, zinc is low in toxicity but inhalation of fumes may cause “metal fume fever”. Onset of symptoms may be delayed 4-12 hours and can include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24-48 hours and leave no lasting effect.

**Items with a single * are suspected carcinogens in humans: See Pages 4 -6 for detailed information.*

Physical Data

Alloy Group	Appearance & Odor	Specific Gravity	Melting Point	Solubility In Water
Aluminum	Silvery Gray/Odorless	2.5-2.9	900° F - 1200° F	Negligible
Copper	Reddish Tone/Odorless	7.45-9.00	1290° F - 2260° F	Insoluble
Copper-Nickel	Silver to Red Brown	8.94	2240° F - 2260° F	Insoluble
Nickel & Nickel Base	Metallic/Odorless	8.00	2600° F - 2800° F	Insoluble
Beryllium Copper	Copper to Brass/Odorless	8.26	1600° F - 1875° F	Insoluble
Brass	Yellow to Gold Odorless	7.45-9.00	1290° F - 2260° F	Insoluble
Bronze	Red Brown to Gold/Odorless	7.45-9.00	1290° F - 2260° F	Insoluble
Stainless Steel	Silvery Gray/Odorless	8.00	2400° F - 2800° F	Insoluble
Carbon Steel	Cloudy Gray/Odorless	8.00	2600° F - 2800° F	Insoluble

Note: Boiling Point, Vapor Pressure, Evaporation Rate and Vapor Density are Not Applicable.

Special Precautions and Information

FIRE AND EXPLOSION:
The metal products manufactured and/or distributed by Alaskan are in a stable solid state and in that state pose no threat of fire or explosion. Fires involving fines or chips should be extinguished with dry sand or Class D extinguishers. Halogenated extinguishers should NOT be used. Moisture trapped in molten metal may cause an explosion. Hazardous polymerization will not occur.

SPILL OR LEAK PROCEDURES:
Vacuum if possible, rather than sweep fines, dust and filings. If sweeping is required, use a dust inhibitor. Follow Federal, State and local regulations for disposal. Most metal chips and scrap are fully recyclable.

PERSONNEL PROTECTION:
Local exhaust ventilation should be provided for melting, welding, burning, grinding and cutting operations. If fumes and dust cannot be controlled with exhaust ventilation, an appropriate NIOSH-approved respiratior should be used to prevent excessive inhalation exposure. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis and to limit cuts and abrasions. Eye proctection through the use of approved safety glasses or goggles should be worn when working with metal processing and when entering or passing through an area where such processing is being done. Approved ear plugs or ear muffs should be worn where noise levels reach or exceed 90 decibels. Employees involved in the handling of material should wear safety shoes equipped with steel toes.

EMERGENCY AND FIRST AID:
EYES: Immediately flush eyes with water for at least 15 minutes. SKIN: Brush off excess dust and scrub area with soap and water. Metal edges cut easily, care should be taken in handling material. Cuts should be attended to in a common sense manner and medical help should be contacted when serious injuries are sustained. INHALATION: Remove to fresh air, contact medical attention. Wear masks when appropriate. INGESTION: Seek medical help if large quantities have been ingested. Food should not be consumed in the work area.

Abbreviated Glossary of Acronyms and Terms

ACGIH - American Conference of Governmental Industrial Hygienists
CAS - Chemical Abstracts Service Registry Number
CEILING - Limit Not To be Exceeded, Except For Peak Limit
EPA - Environmental Protection Agency
IARC - International Agency for Research on Cancer
NIOSH - National Institute for Occupational Safety and Heath of the Public Health Service, U.S. Department of Health and Human Services (DHHS)
NTP - National Toxicology Program
PEAK - 30 Minute Maximum Duration Concentration Above Ceiling Limit
PEL - Permissible Exposure Limit
STEL - Short Term Exposure Limit
TLV - Eight hour average threshold limit value
TWA - Time Weighted Limit

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