

# Copper Brass Sales

## COPPER/COPPER ALLOYS + BRASS

Re-Issue Date: September 1, 1990

(313) 775-7710

Copper and Brass Sales, Inc.  
17401 Ten Mile Road  
East Detroit, Michigan 48021

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### SECTION I. MATERIAL IDENTIFICATION

REVISED - JANUARY 3, 1994

#### Copper/Copper Alloys

See attached alloy composition sheets for alloy presence and percentages of alloying ingredients.

### SECTION II. HAZARDOUS INGREDIENTS

#### Copper/Copper Alloys

	CAS Number		OSHA-PEL 8-hr TWA	ACGIH-TLV 8-HR TWA (1984-85)	ACGIH STEL (1984-85)
Aluminum	(7429-90-5)	(Dust)	--	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>
		(Fume)	--	5 mg/m <sup>3</sup>	--
Antimony	(7440-36-0)		0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	--
Arsenic	(7440-38-2)		0.5 mg/m <sup>3</sup>	0.02 mg/m <sup>3</sup>	--
Beryllium	(7440-41-7)		0.002 mg/m <sup>3</sup>	0.002 mg/m <sup>3</sup>	--
Cadmium	(7440-43-9)	(Dust)	0.2 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>
		(Fume)	0.1 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> *	--
Chromium	(7440-47-3)		1 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	--
Cobalt	(7440-48-4)		0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	--
Copper	(7440-50-8)	(Dust)	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>
		(Fume)	0.1 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	--
Iron	(1309-37-11)		10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
				(As iron oxide fume)	
Lead	(7439-92-1)		0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	0.45 mg/m <sup>3</sup>
Manganese	(7439-96-5)	(Dust)	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	--
		(Fume)	--	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>
Nickel	(7440-02-0)		1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	--
Phosphorus	(7723-14-0)		0.01 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>
Silicon	(7440-21-3)		(1)	(2)	20 mg/m <sup>3</sup>
Silver	(7440-22-4)		0.01 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	--
Sulphur (Yellow)	(7704-34-9)		13 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	5/10 mg/m <sup>3</sup>
Tellurium	(13494-80-9)		0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	--
Tin	(7440-31-5)		2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>
Zinc	(1314-13-2)	(Dust)	--	(2)	--
		(Fume)	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
				(As zinc oxide)	
Zirconium	(7440-67-7)		5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>

\*Ceiling Limit

Note: antimony trioxide, beryllium, cadmium, chromium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens.

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### SECTION III. PHYSICAL DATA

Physical Form:	Solid	Specific Gravity:	7.45 - 9.00
Boiling Point:	Not Applicable	Vapor Density:	Not Applicable
Freeze-Melt Temperature:	Approximately 1290 <sup>o</sup> - 2260 <sup>o</sup> F	Solubility in H <sub>2</sub> O:	Insoluble
Vapor Pressure:	Not Applicable	Color:	Silver or Yellow to Red
Evaporation Rate:	Not Applicable	Odor:	None

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### SECTION IV. FIRE AND EXPLOSION DATA

Flash Point: (Method Used) Not Applicable  
Flammable Limits (LEL-UEL) Not Applicable

Extinguishing Media: See Below  
Auto Ignition Temp. - Not Applicable

**Special Fire Fighting Procedures:** Solid massive form is not combustible. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat, flames, chemical reaction, or in contact with powerful oxidizers. Use special mixtures of dry chemical or sand. Firefighters should wear self-contained breathing apparatus and protective clothing.

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### SECTION V. REACTIVITY DATA

**Stability:** Stable.

**Conditions to Avoid:** Stable under normal conditions of transport and storage. Molten metal may react violently with water.

**Incompatibility (Materials to Avoid):** Acids, bases, and oxidizers.

**Hazardous Decomposition or Byproducts:** Metal fume.

**Hazardous Polymerization:** Will not occur

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### SECTION VI. HEALTH HAZARD DATA

Permissible Exposure Limits and Threshold Limit Values. See Section II.

Route(s) of Entry: Inhalation: Yes; Skin: Yes; Ingestion: Yes

Under normal handling conditions the solid alloy presents no significant health hazards. Processing of the alloy by dust or fume producing operation (grinding, buffing, heating, welding, etc.) may result in the potential for exposure to airborne metal particulates or fume. The exposure levels in Section II are relevant to fumes and dusts.

Effects of Overexposure:

**Aluminum** -- Excessive exposure to aluminum fume and dust has been associated with lung disease, but this effect is probably due to simultaneous silica exposure.

**Antimony** -- Antimony and its compounds are irritating to the skin and mucous membranes and are systemic poisons. Effects are reported to include metallic taste in the mouth, vomiting, colic, loss of appetite and weight, and diarrhea. In addition, 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.

**Beryllium** -- Inhalation of beryllium dust or fume may result in the production of an acute or chronic systematic disease depending upon the level of exposure and the beryllium compound involved. Granulomatous lesions of the skin, liver, kidneys, spleen, and lymph nodes have been reported.

Damage to the lungs may be in both the acute and chronic forms, both of which have similar signs and symptoms. These include a relatively non-productive cough, progressive difficulty in breathing, loss of appetite, and loss of weight. The major difference between the two is the suddenness of onset and the rate of progression. In the acute form, the symptoms appear in several hours to several weeks after exposure and there is usually rapid progression of signs including dyspnea, anorexia, and extreme weight loss. Complete recovery is possible and fatal cases usually result from acute heart disease. In chronic beryllium disease, the symptoms or signs are generally delayed in their onset and are persistent in nature. They may be triggered or aggravated by stresses such as pregnancy, respiratory infection, and thyrotoxicosis. In the progression of the disease, symptoms of heart disease may occur.

Beryllium is also a suspected human carcinogen and has caused cancer in laboratory animals.

**Cadmium** -- Inhalation of cadmium 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 have been reported as a result of the irritation of the fumes. Headaches, dizziness, loss of appetite, and weight loss have also been

reported and the liver, kidneys and bone marrow may be injured by the presence of the metal.

Continued exposure to lower levels of cadmium has resulted in chronic poisoning characterized by irreversible lung damage and kidney damage. A single, high level exposure to cadmium can cause severe lung irritation which may be fatal. Cadmium is also a suspected human carcinogen.

**Chromium** -- In some workers, chromium compounds act as allergens and may cause dermatitis and may also produce pulmonary sensitization. Chromic acid and chromates have a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract. Although rare, there may be the possibility of skin and pulmonary sensitization.

IARC has determined that there is sufficient evidence of increased lung cancer among workers in the chromate-producing industry and possible chromium alloy workers. This determination is supported by sufficient evidence for carcinogenicity to animals and possible mutagenicity testing of Cr VI compounds.

**Cobalt** -- Cobalt has been reported as causing hypersensitization type dermatitis in individuals who are susceptible. Animal studies have shown that particulate cobalt is an acutely irritating substance and industrial exposures, possibly combined with small amounts of silica, are reported capable of producing serious pneumoconiosis which is initially of an insidious nature.

**Copper** -- Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present potentially significant health hazards. Fumes of copper may cause metal fume fever with flu-like symptoms and skin and hair discoloration. While industrial dermatitis has not been reported, keratinization of the hands and the soles of the feet has been reported. Systemically as well, copper dust and fume cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.

**Iron** -- The inhalation of iron oxide fumes or dust may cause an apparent benign pneumoconiosis which is called siderosis. This disease is reported to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible.

**Lead -- Short term exposure:** Lead is an accumulative poison. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains, and decreasing appetite. The effects are reversible and complete recovery is possible. Inhalation of large amounts of lead may lead to seizures, coma, and death.

**Lead -- Long term exposure:** Long term exposure can result in a buildup of lead in the body and more severe symptoms. These include anemia, pale skin, a blue line at the gum margin, decreased handgrip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may also result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headache, convulsions, coma, delirium, and death. Alcohol ingestion and physical exertion may bring on symptoms. Continued exposure can result in decreased fertility and/or increased chances of miscarriage or birth defects.

**Manganese** -- Chronic manganese poisoning may result from inhalation of dust or fume. The central nervous system is the chief site of the injury. Chronic manganese poisoning is not a fatal disease although it is extremely disabling. Some individuals may be hypersusceptible to manganese. Freshly formed manganese fume has caused fever and chills similar to metal fume fever.

**Nickel** -- The most common ailment arising from contact with nickel or its compounds is an allergic dermatitis known as "nickel itch" which usually occurs when the skin is moist. Generally nickel and most salts of nickel do not cause systemic poisoning, but nickel has been identified as a suspected carcinogen.

**Silicon** -- Accumulation in lungs may be responsible for benign pneumoconiosis, but is not considered to be responsible for pulmonary functional impairment or respiratory symptoms.

**Tin** -- The inhalation of inorganic tin fumes or dust may cause an apparent benign pneumoconiosis called stannosis which is reported not to be disabling.

**Zinc (as Oxide)** -- Zinc is very low in toxicity but inhalation of fumes may cause "metal fume fever." Onset of symptoms may be delayed 4-12 hours and 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 effect.

**Note:** Antimony trioxide, beryllium, cadmium, chromium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens.

#### **Emergency First Aid Procedures:**

**Eye Contact** Flush well with running water to remove particulate. Get medical Attention.

**Skin Contact** Vacuum off excess dust. Wash well with soap and water.

**Inhalation** Remove to fresh air. Get medical attention.

**Ingestion** Seek medical attention if large quantities of material have been ingested.

## SECTION VII. PRECAUTIONS FOR SAFE HANDLING OR USE

**Steps to be Taken in Case Material is Released or Spilled:** No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentration of airborne dust. If liquids (acids or bases) containing solubilized metal are spilled evacuate unprotected personnel from area. Absorb liquid by means of vermiculite, dry sand or similar material. Follow federal, state, and local regulations concerning the disposal of waste.

**Waste Disposal Method:** Dispose of in accordance with federal, state, and local regulations. Cleanup personnel should wear respirators and protective clothing. Ventilate area of release.

**Precautions to be Taken in Handling and Storing:** Store material away from incompatible materials and keep dust from sources of ignition.

**Other Precautions:** See all other sections of this MSDS.

## SECTION VIII. CONTROL MEASURES

**Respiratory Protection:** If exposure above the PEL or TLV, NIOSH approved respirator for fume or dust, dependent upon the source of airborne contaminant.

**Ventilation:** Required if dust or fume created in handling or working on this material.

**Local Exhaust:** Required if dust or fume created in handling or working on this material.

**Mechanical (general):** As above to reduce airborne dust or fume levels.

**Protective Gloves:** Required for melt, grind, cut or weld operations. Select glove approved for the specific operation.

**Eye Protection:** Required for melt, grind, cut, or weld operations. Minimum requirement of safety glasses with side shields for these operations. Melting and welding may require special eye protection including face shields and specially tinted glass. Grinding operations may also require face shields.

**Other Protective Clothing or Equipment:** As required for the work done on or with the metal.

**Work/Hygiene Practices:** As required for the work done with lead bearing materials. Meet requirements of the OSHA lead standard where necessary. Always evaluate the jobs done on this product in accordance with OSHA or relevant state, federal, or local standards.

### IMPORTANT

#### LIABILITY DISCLAIMER

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct as it was obtained from sources we believe are reliable. However, 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 used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.

Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.

ALLOY (NOMINAL) COMPOSITION SHEET

COPPER AND BRASS SALES, INC.  
17401 TEN MILE ROAD  
EAST DETROIT, MICHIGAN 48021  
313-775-7710

Copper Alloy UNS No.	Name	Copper, %	Zinc, %	Lead, %	Tin, %	Phosphorus, %	Arsenic, %	Iron, %	Antimony, %	Aluminum, %
C34200	High Leaded Brass	64.00	34.00	2.00	-	-	-	-	-	-
C34500	High Leaded Brass	63.00	35.25	1.75	-	-	-	-	-	-
C35000	Medium Leaded Brass	62.00	36.90	1.10	-	-	-	-	-	-
C35300	High Leaded Brass	61.50	36.70	1.80	-	-	-	-	-	-
C35600	Extra High Leaded Brass	62.50	35.00	2.50	-	-	-	-	-	-
C36000	Free Cutting Brass	61.50	35.25	3.25	-	-	-	-	-	-
C36500	Leaded Muntz Metal	60.00	39.35	0.65	-	-	-	-	-	-
C37000	Free Cutting Muntz Metal	60.00	39.00	1.00	-	-	-	-	-	-
C37700	Forging Brass	60.00	38.00	2.00	-	-	-	-	-	-
C38500	Architectural Bronze	57.00	40.00	3.00	-	-	-	-	-	-
C41100	Bearing Bronze	90.00	9.50	-	0.50	-	-	-	-	-
C42500	Contact Bronze	88.50	9.30	-	2.00	0.20	-	-	-	-
C43500	Trumpet Metal	81.00	18.10	-	0.90	-	-	-	-	-
C44300	Arsenical Admiralty	71.00	27.96	-	1.00	-	0.04	-	-	-
C44400	Antimonial Admiralty	71.00	28.00	-	1.00	-	-	-	-	-
C44500	Phosphorized Admiralty	71.00	27.96	-	1.00	0.04	-	-	-	-
C46200	Naval Brass	63.50	35.75	-	0.75	-	-	-	-	-
C46400	Naval Brass	60.00	39.25	-	0.75	-	-	-	-	-
C46500	Arsenical Naval Brass	60.00	39.70	-	0.80	-	0.06	-	-	-
C48200	Leaded Naval Brass	60.00	38.55	0.70	0.75	-	-	-	-	-
C48500	Leaded Naval Brass	60.00	37.50	1.75	0.75	-	-	-	-	-
C50500	Phosphor Bronze (E)	98.70	-	-	1.30	0.16	-	-	-	-
C51000	Phosphor Bronze (A)	94.80	-	-	5.00	0.20	-	-	-	-
C51100	Phosphor Bronze	95.60	-	-	4.20	0.20	-	-	-	-
C52100	Phosphor Bronze (C)	91.75	-	-	8.00	0.25	-	-	-	-
C52400	Phosphor Bronze (D)	89.75	-	-	10.00	0.25	-	-	-	-
C53400	Phosphor Bronze (B-1)	93.90	-	1.00	5.00	0.10	-	-	-	-
C54400	Phosphor Bronze (B-2)	87.90	4.00	4.00	4.00	0.10	-	-	-	-
C61000	Aluminum Bronze	92.00	-	-	-	-	-	-	-	8.00
C61400	Aluminum Bronze (D)	90.25	-	-	-	-	-	2.75	-	7.00

**ALLOY (NOMINAL) COMPOSITION SHEET**

**COPPER AND BRASS SALES, INC.**  
 17401 TEN MILE ROAD  
 EAST DETROIT, MICHIGAN 48021  
 313-775-7710

Copper Alloy UNS No.	Name	Copper, %	Zinc, %	Lead, %	Manganese, %	Tin, %	Phosphorus, %	Arsenic, %	Tellurium, %	Chromium, %	Cadmium, %	Sulfur, %	Zirconium, %	Silicon, %	Silver, %	Beryllium, %
C10100	Oxygen Free Electronic Copper	99.99+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10200	OF Copper	99.95+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10300	Oxygen Free Extra Low Phosphorus	99.95+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10400	Silver Bearing OFHC Copper	99.9+	-	-	-	-	.003	-	-	-	-	-	-	-	8-12 oz*	-
C10700	Silver Bearing OFHC Copper	99.9+	-	-	-	-	-	-	-	-	-	-	-	-	25-30 oz*	-
C10800	Oxygen Free Low Phosphorus	99.95+	-	-	-	-	.008	-	-	-	-	-	-	-	0.01(B)	-
C11000	Electrolytic Tough Pitch Copper	99.9+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C11300	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	8 oz*	-
C11400	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	10-15 oz*	-
C11500	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	16 oz*	-
C11600	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	25-30 oz*	-
C12000	Phosphorized Copper DLP	99.9+	-	-	-	-	.008	-	-	-	-	-	-	-	-	-
C12200	Phosphorized Copper	99.98	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-
C14200	Arsenical Copper DPA	99.68	-	-	-	-	0.02	0.03	-	-	-	-	-	-	-	-
C14500	Tellurium Copper	99.49	-	-	-	-	0.01	-	0.50	-	-	-	-	-	-	-
C14700	OFHC <sup>o</sup> Sulfur Copper	99.70	-	-	-	-	-	-	-	-	0.30	-	-	-	-	-
C15000	Amzirc <sup>o</sup> (Zirconium Copper)	99.83	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-
C16200	Cadmium Copper	99.0	-	-	-	-	-	-	-	-	1.00	-	-	-	-	-
C16500	Cadmium Copper	98.58	-	-	-	0.60	-	-	-	-	0.80	-	-	0.02	-	-
C17000	Beryllium Copper	98.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1.70
C17200	Beryllium Copper	98.1	-	-	-	-	-	-	-	-	-	-	-	-	-	1.90
C17300	Beryllium Copper	97.7	-	0.40	-	-	-	-	-	-	-	-	-	-	-	1.90
C17500	Beryllium Copper	96.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.60
C18200	Chromium Copper	99.14	-	-	-	-	-	-	-	0.85	-	-	-	0.01	-	-
C18700	Leaded Copper	99.00	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-
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C21000	Gilding	95.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C22000	Commercial Bronze	90.00	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C22600	Jewelry Bronze	87.50	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-
C23000	Red Brass	85.00	15.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C24000	Low Brass	80.00	20.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C26000	Cartridge Brass	70.00	30.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C26800	Yellow Brass	66.00	34.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27000	Yellow Brass	65.00	35.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27200	Yellow Brass	63.00	37.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27400	Yellow Brass	62.00	38.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C28000	Muntz Metal	60.00	40.00	-	-	-	-	-	-	-	-	-	-	-	-	-
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C31400	Leaded Commercial Bronze	89.00	9.10	1.90	-	-	-	-	-	-	-	-	-	-	-	-
C31600	High Strength Commercial Bronze	89.50	7.65	1.75	-	-	0.10	-	-	-	-	-	-	-	1.00 (NI)	-
C32000	Hardware Bronze	85.00	13.25	1.75	-	-	-	-	-	-	-	-	-	-	-	-
C33000	Low Leaded Tube Brass	66.50	33.00	0.50	-	-	-	-	-	-	-	-	-	-	-	-
C33100	Leaded Tube Brass	66.00	33.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-
C33200	Free Cutting Tube Brass	66.50	31.90	1.60	-	-	-	-	-	-	-	-	-	-	-	-
C33500	Low Leaded Brass	65.00	34.50	0.50	-	-	-	-	-	-	-	-	-	-	-	-
C34000	Medium Leaded Brass	65.00	34.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-

\*Silver content is expressed in troy ounces per avoirdupois ton (1 oz. per ton is equivalent to 0.0034 per cent).  
<sup>o</sup>Trademark of American Metal Climax, Inc.

ALLOY (NOMINAL) COMPOSITION SHEET

COPPER AND BRASS SALES, INC.  
17401 TEN MILE ROAD  
EAST DETROIT, MICHIGAN 48021  
313-775-7710

Copper Alloy UNS No.	Name	Copper, %	Zinc, %	Lead, %	Tin, %	Phos, phorus, %	Ar-senic, %	Man-ganese, %	Iron, %	Sili-con, %	Nickel, %	Alumi-num, %
C63000	Aluminum Nickel Bronze	82.00	-	-	-	-	-	1.00	2.50	-	5.00	9.50
C64200	Aluminum Bronze	90.75	-	-	-	-	-	-	-	1.85	-	6.95
C65100	Low Silicon Bronze (B)	98.25	-	-	-	-	-	0.25	-	1.50	-	-
C65500	High Silicon Bronze (A)	95.80	-	-	-	-	-	1.10	-	3.10	-	-
C66700	Manganese Brass	70.00	28.80	-	-	-	-	1.20	-	-	-	-
C68700	Aluminum Brass-Arsenical	77.50	20.46	-	-	-	0.04	-	-	-	-	2.00
C69400	Silicon Red Brass	81.50	14.50	-	-	-	-	-	-	4.00	-	-
C70600	Cupro Nickel, 10%	88.35	-	-	-	-	-	0.40	1.25	-	10.00	-
C71000	Cupro Nickel, 20%	78.75	-	-	-	-	-	0.50	0.75	-	20.00	-
C71500	Cupro Nickel, 30%	68.90	-	-	-	-	-	0.60	0.50	-	30.00	-
C72500	Cupro Nickel, 9%	88.20	-	-	2.30	-	-	-	-	-	9.50	-
C74500	Nickel Silver, 10%	65.00	24.75	-	-	-	-	0.25	-	-	10.00	-
C75200	Nickel Silver, 18%	64.50	17.25	-	-	-	-	0.25	-	-	18.00	-
C75700	Nickel Silver, 12%	65.00	22.75	-	-	-	-	0.25	-	-	12.00	-
C76200	Nickel Silver, 12%	59.00	28.75	-	-	-	-	0.25	-	-	12.00	-
C77000	Nickel Silver, 18%	55.00	26.75	-	-	-	-	0.25	-	-	18.00	-
C77300	Nickel Silver	48.58	41.00	-	-	0.02	-	-	-	0.15	10.25	-
C78200	Leaded Nickel Silver	65.00	25.00	2.00	-	-	-	-	-	-	8.00	-
C79200	Leaded Nickel Silver, 12%	61.50	25.50	1.00	-	-	-	-	-	-	12.00	-
C79600	Leaded Nickel Silver, 10%	45.00	42.00	1.00	-	-	-	2.00	-	-	10.00	-
C93200	Bearing Bronze	82.00	2.75	7.00	6.50	0.15	-	-	0.20	.005	1.00	.005
C95400	Aluminum Bronze	83.50	-	-	-	-	-	0.50	4.00	-	1.50	10.50

\*Antimony 0.32 - Sulfur 0.07)

Chemical analysis has not been performed by or for Copper and Brass Sales, Inc. with respect to the items listed in this MSDS alloy composition sheet. Data supplied is furnished by our various suppliers, ASTM or CDA. If an alloy is not listed please contact Copper and Brass Sales, Inc. for MSDS information.

Alloy sheets are not to be used for material design specifications. Refer to ASTM or CDA for alloy composition.

## MATERIAL SAFETY DATA SHEET ALUMINUM ALLOYS

<b>COMPANY</b> Copper and Brass Sales, Inc. 17401 Ten Mile Road East Detroit, Michigan 48021	<b>ISSUE DATE</b> November 25, 1985	<b>IDENTIFICATION NUMBER</b> N/A
<b>TRADE NAME (Common Name or Synonym)</b> Aluminum Alloys		<b>EMERGENCY PHONE NUMBER</b> 313-775-7710
<b>CHEMICAL NAME</b> Aluminum (does not include lithium and nickel alloys)	<b>FORMULA</b> Al	<b>DOT IDENTIFICATION NUMBER</b> N/A

### I. INGREDIENTS

MATERIAL OR COMPONENT		1984-85 ACGIH TLV (mg/m <sup>3</sup> )*		OSHA 1910.1000 TWA (mg/m <sup>3</sup> )**
<b>BASE METAL</b>	<b>CAS NUMBER</b>	<b>% COMPOSITION BY WEIGHT</b>		
Aluminum	7429-90-5	80.0-99.7		Not established
MAXIMUM % COMPOSITION BY WEIGHT				
<b>ALLOYING ELEMENT</b>	<b>CAS NUMBER</b>	<b>1.0-10.0</b>	<b>1.0-20.0</b>	<b>OSHA 1910.1000 TWA (mg/m<sup>3</sup>)**</b>
Cobalt, Co	7440-48-4	W, P		0.1
Copper, Cu	7440-50-8	W		0.2, as fume
Iron, Fe	1309-37-1	W, P		5.0, as fume
Magnesium, Mg	1309-48-4	W	P	10.0, as fume
Manganese, Mn	7439-96-5	W		15.0, as fume
Silicon, Si	7440-21-3		W, P	5.0 Ceiling
				10.0, as total dust
				Not established
				5.0, as respirable dust
Tin, Sn	7440-31-5		P	" "
Zinc, Zn	1314-13-2	W, P		2.0, as inorganic compounds
Lead, Pb	7439-92-1		W	5.0, as fume
				.15, as fume

**Key:**  
 W = Wrought aluminum (fabricated products)  
 P = Prime and ingot hardener aluminum  
 \*TLV = Threshold-Limit-Value  
 \*\*TWA = Time-Weighted-Average

**Note:** Aluminum alloys may be comprised of all or variations of the alloys shown here. In addition, the welding of aluminum alloys may produce the products listed in Section VII, #7.

### II. PHYSICAL DATA

<b>MATERIAL IS (At Normal Conditions):</b> <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other		<b>APPEARANCE AND ODOR</b> Metallic appearance; no odor	
<b>ACIDITY/ALKALINITY</b> pH = NA	<b>Melting Point</b> 440-1215 °F <b>Boiling Point</b> NA °F	<b>Specific Gravity (H<sub>2</sub>O = 1)</b> 2.5 - 2.9 <b>Solubility in water (% by weight)</b> nil	<b>VAPOR PRESSURE</b> (mm Hg at 20°C) NA

### III. PERSONAL PROTECTIVE EQUIPMENT

Appropriate personal protective equipment is required when melting, casting, machining, forging, or otherwise processing. The nature of the processing activity will determine what form of equipment is necessary, i.e., glasses, respirator, protective clothing, and ear protection.

### IV. EMERGENCY MEDICAL PROCEDURES

**For Skin contact,** remove particles by thoroughly washing with soap and water.

**For eye contact,** flush with water for at least 15 minutes. Get medical attention if irritation persists.