

MATERIAL SAFETY DATA SHEET ALUMINUM ALLOYS

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

I. INGREDIENTS

MATERIAL OR COMPONENT			1984-85 ACGIH TLV (mg/m ³)*	OSHA 1910.1000 TWA (mg/m ³)**
BASE METAL	CAS NUMBER	% COMPOSITION BY WEIGHT		
Aluminum	7429-90-5	80.0-99.7	10.0, as metal dust and oxide 5.0, as welding fume	Not established
MAXIMUM % COMPOSITION BY WEIGHT				
ALLOYING ELEMENT	CAS NUMBER	1.0-10.0	1.0-20.0	1984-85 ACGIH TLV (mg/m³)*
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		1.0, as fume
Silicon, Si	7440-21-3		W, P	10.0, as total dust 5.0, as respirable dust
Tin, Sn	7440-31-5		P	2.0, as oxide and metal
Zinc, Zn	1314-13-2	W, P		5.0, as fume
Lead, Pb	7439-92-1		W	.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

MATERIAL IS (At Normal Conditions): <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other		APPEARANCE AND ODOR Metallic appearance; no odor	
ACIDITY/ALKALINITY pH = NA	Melting Point 440-1215 °F Boiling Point NA °F	Specific Gravity (H₂O = 1) 2.5 - 2.9 Solubility in water (% by weight) nil	VAPOR PRESSURE (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.

V. HEALTH/SAFETY INFORMATION

Health	Inhalation	Not likely unless material machined, welded or remelted. Short term overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of throat and nose.			
	Ingestion	Not likely.			
	Skin	Not likely.			
	Eyes	May irritate eyes when welding or plasma cutting.			
THRESHOLD LIMIT VALUE See Ingredients Section.					
Fire and Explosion	Flash Point	NA °F	AUTO IGNITION TEMPERATURE NA °F	FLAMMABLE LIMITS IN AIR Lower NA % Upper NA %	EXTINGUISHING MEDIA Dry powder or sand.
	UNUSUAL FIRE AND EXPLOSION HAZARDS Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive air mixtures. SEE ADDITIONAL INFORMATION.			EXTINGUISHING MEDIA NOT TO BE USED Do not use water or halogen on dust fires.	
Reactivity	STABILITY	INCOMPATIBILITY (Materials to Avoid)			
	<input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	Anhydrous bromine.			
	CONDITIONS TO AVOID See Fire and Explosion Section. SEE ADDITIONAL INFORMATION.				
HAZARDOUS DECOMPOSITION PRODUCTS See Fire and Explosion Section. SEE ADDITIONAL INFORMATION.					

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES	NA
WASTE DISPOSAL METHODS*	Used or unused product should be tested to determine hazard status and disposal requirements under federal, state, or local laws and regulations. *Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

1. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen.
2. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate.
3. When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. This applies to the collection of moisture in saw cavities as well. Moisture must be driven off prior to remelting.
4. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
5. Aluminum powder must be packaged and shipped as a Flammable Solid, UN1396.
6. Hard alloy ingots in the 2000 and 7000 series must be stress-relieved to prevent explosion when sawed.
7. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express 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 the product.

Data sheets of individual manufacturers may be obtained by contacting Copper & Brass Sales, Inc., 17401 Ten Mile Rd., E. Detroit, MI 48021.

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

*Unified
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 Systems
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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

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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.