

MATERIAL SAFETY DATA SHEET

ALUMINUM

Updated 9/93

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Aluminum

General Use: For the engraving industry.

Company: UEI™ Systems, A Division of Universal Engraving, Inc.
9090 Nieman Road Overland Park, KS, USA 66214
1-800-821-8864 or 913-599-0244

Emergency Contact: 1-800-424-9300 United States and Canada
01-703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

	CAS #	%		CAS #	%
Aluminum	7429-90-5	80-99.7	Copper	7440-50-8	<10
Magnesium	7439-95-4	<10	Zinc	7440-66-6	<10
Cobalt	7440-48-4	<2	Iron	7439-89-6	<2
Manganese	7439-96-5	<2	Silicon	7440-21-3	<14
Tin	7440-31-5	<2	Chromium	7440-47-3	<0.5
Nickel	7440-02-0	<0.7			

This MSDS also covers two leaded alloys which have the following lead content:

Lead	7439-92-1	<1
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3. HAZARDS IDENTIFICATION

Gray to silver solid with no odor. Not hazardous.

4. FIRST AID MEASURES

In case of dust exposure:

Inhalation: In case of discomfort remove to a ventilated area. Consult a physician.

Skin Contact: Wash skin thoroughly with soap and water. In case of burns with hot metal, rinse with plenty of cold water and consult a physician.

Eye Contact: Flush eyes thoroughly with water taking care to rinse under the eyelids. If irritation persists continue for 15 minutes, rinsing occasionally under the eyelids. If discomfort continues consult a physician.

Ingestion: Not Applicable

5. FIRE FIGHTING MEASURES

Not a fire hazard unless in particle form. Suspensions of aluminum dust in air may pose a severe explosion hazard. A potential for explosion exists for a mixture of fine and coarse particles if a least 15-20% of the material is finer than 44 microns (325 mesh). (Buffing and polishing generate finer material than grinding, sawing, and cutting.) In case of aluminum fires, use a class D dry-powder extinguisher. Do not use water or halogenated extinguishing media.

Hazardous Combustion Products: Not applicable.

6. ACCIDENTAL RELEASE MEASURES: Not applicable.

7. HANDLING AND STORAGE

Because of the risk of explosion, aluminum ingots and metal scrap should be thoroughly dried prior to remelting. Use standard techniques to check metal temperature before handling. Hot aluminum does not present any warning color change. Exercise great caution, since the metal may be hot.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Special ventilation should be used to convey finely divided metallic dust generated by grinding, sawing, etc., in order to eliminate explosion hazards. Maintain dust concentration in ventilation ducts below the lower explosive limit of 40 g/m3 (0.04 oz/ft3). See "National Fire Protection Association Codes": Code 65 "Processing and Finishing of Aluminum", Code 651 "Standard for the Manufacture of Aluminum and Magnesium Powder", and Code 77 "Static Electricity". Use an approved respirator designed for the hazard, where concentrations exceed exposure limits. The use of both primary and secondary protective equipment is necessary when handling molten metal. Refer to "Aluminum Association" guidelines.

Exposure Limits:	ACGIH TLV (mg/m3)		OSHA (PEL) (mg/m3)	
	TWA	STEL	TWA	Ceiling
Aluminum total dust	10	none	15	none
Aluminum fume, powder, resp. Dust	5	none	5	none
Cobalt	0.05	none	0.1	none
Lead inorg. dust & fumes	0.15	none	0.05	none
Silicon total dust	10	none	15	none
Silicon resp. dust	none	none	5	none
Tin metal & oxide (As Sn)	2	none	2	none
Chromium metal	0.5	none	1	none
Nickel metal	1	none	1	none
Iron oxide (Fe2O3)	none	none	10	none
Copper fume	0.2	none	0.1	none

Copper dust	1	none	1	none
Zinc oxide fume	5	10	5	none
Zinc oxide total dust	10	none	15	none
Manganese dust	5	none	5	5-ceiling
Manganese fumes	1	3	5	5

MATERIAL SAFETY DATA SHEET FOR ALUMINUM CONTINUED:

9. PHYSICAL AND CHEMICAL PROPERTIES

pH: NA	Flashpoint: NA
Boiling Point: NA	Auto-ignition: NA
Melting Point: <1220 deg. C	Lower Flammable limit: NA
Vapor Pressure: NA	Higher Flammable Limit: NA
Vapor Density (Air = 1): NA	Explosive Properties: Not determined
Evaporation Rate: NA	Odor Threshold: Not determined
Relative Density (Water = 1): >2	Oxidizing Properties: Not determined
Water Solubility: NA	NFPA fire code: 0
Partition Coefficient (n-octanol/water): Not determined	

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions and Material to Avoid: Molten aluminum may explode on contact with water. In the form of particles, may explode when mixed with halogenated acids, halogenated solvents, bromates, iodates, or ammonium nitrate. Aluminum particles on contact with copper, lead, or iron oxides can react vigorously with release of heat if there is a source of ignition or intense heat.

Hazardous Decomposition Products: In the form of particles, aluminum reacts with halogenated acids, water, and sodium hydroxide, producing flammable hydrogen gas.

11. TOXICOLOGICAL INFORMATION

Route of Exposure: Inhalation

Acute Effects: Inhalation: Solid aluminum does not present an inhalation hazard. Aluminum and silicon dusts generated during use are considered nuisance particulates. High concentrations of freshly-formed fumes of copper, magnesium, manganese, or zinc oxides can produce symptoms of metal fume fever. High concentrations of copper dust can cause irritation of the upper respiratory tract.

Chronic Effects: Ingestion and inhalation: Aluminum fumes generated during welding or melting present low health risks. High concentrations of manganese dust can affect the central nervous system (apathy, drowsiness, weakness, and other symptoms resembling to Parkinson's disease). Lead compounds bioaccumulate. The most frequent chronic effects are kidney and central nervous damages and anemia. Medical surveillance should be undertaken to prevent high blood lead levels.

Medical Conditions Aggravated by Exposure to the Product: Not determined.

Carcinogenicity/Mutagenicity/Reproductive Toxicity: Nickel, chromium, and some of their compounds are listed in the current "Annual Report on Carcinogens" prepared by the "National Toxicology Program" (NTP). The International Agency for Research on Cancer (IARC) classifies lead compounds in group 2B: possibly carcinogenic in humans (no evidence in humans but sufficient evidence in animals).

12. DISPOSAL CONSIDERATIONS

Recycle if possible. Dispose of waste in accordance with federal, state, and local regulations. Aluminum in the form of particles may be reactive and its hazardous characteristics should be determined prior to disposal.

13. REGULATORY INFORMATION

WHMIS Classification (Canada): D2 Material causing other toxic effects. EEC Classification (Europe): Not Classified.

USA Regulations: This product contains lead. Any process resulting in exposure to more than 0.5 mg/m³ of metal dust may result in a daily dose of lead of over 0.5ug/day, the dose above which the "California Safe Drinking Water and Toxic Enforcement Act" of 1986 requires notification. Refer to the appropriate regulation notification wording guidelines.

Section 313 Supplier Notification: This product may contain the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (Title III of SARA) and of 40 CFR 372. (This information must be included in all MSDS's that are copied and distributed for this material).

Chemical Name	CAS #	Chemical Name	CAS #
Manganese	7439-96-5	Chromium	7440-47-3
Copper	7440-50-8	Zinc	7440-66-6
Nickel	7440-02-0	Lead	7439-92-1
Cobalt	7440-48-4		

14. OTHER INFORMATION

UEI™ Systems provides the information contained herein in good faith. It is believed to be correct. However it is not all inclusive and should be used only as a guide. Individuals receiving this information must exercise their independent judgement in determining its appropriateness for a particular purpose. UEI™ Systems shall not be held liable for any damage resulting from handling or from contact with this product.

Abbreviations:

CAS #: Chemical Abstracts Service Registry Number
NA: Not Applicable
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit

EC: European Community
ACGIH: American Conference of Governmental Industrial Hygienists
OSHA: Occupational Safety and Health Administration
C: Celsius