

MATERIAL SAFETY DATA SHEET

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Manufacturer's
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SECTION 1 - IDENTITY

Common Name: Aluminum Unisub

CAS No: NA -alloy

Trade name & Synonyms: Aluminum Unisub

Chemical Family: Metal
Alloy

Chemical Name: Aluminum Alloy

Formula: NA—See
ingredients

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component (s): **This material is an aluminum alloy. This MSDS also discusses potential hazards created by using this product in the sublimation process. Information specific to the alloy is included as required. PLEASE NOTE: Other components used in the sublimation process such as inks are separate materials and are not covered in this MSDS.**

| Chemical name/CAS | % | 2001 Threshold Limit OSHA | |
|-----------------------|-----|-----------------------------|---------------------------|
| | | Value (mg/M ³): | PEL (mg/M ³): |
| Aluminum (7429-90-3) | 95 | 10 | 15 |
| Manganese (7439-96-5) | 1.7 | 0.2 | 5 (Ceiling) |
| Zinc (7440-66-6) | 1.7 | 10 | 15 |

| Chemical name/CAS | % | 2001 Threshold Limit Value (mg/M ³): | OSHA PEL (mg/M ³): |
|-----------------------|-----|--|--------------------------------|
| Magnesium (7439-95-4) | 1.5 | 10 (as oxide fume) | 15 (as oxide fume) |
| Chromium (7440-47-3) | 0.2 | 0.5 | 1 |

NOTE : The following materials were detected in parts per billion quantities, much less than 1 ppm, in a test of 8 hour Time Weighted Average exposures during the sublimation process in a small un-vented room. (1 ppm = 1,000 ppb). Note: all TLVs/PELs are in ppm. This test was performed to simulate worst case conditions. An odor was noted in this controlled situation but an extensive analysis showed that health risk criteria concentrations (TLVs and PELs) were not approached:

| Chemical name: | 2001 Threshold Limit Value (ppm) : | OSHA PEL (ppm): |
|------------------------|------------------------------------|-----------------|
| 1,3 Dichloropropene | 1 | none |
| Acetone | 500 | 1000 |
| Chlorobenzene | 10 | 75 |
| Ethyl Methacrylate | none | none |
| Hexachlorobutadiene | 0.02 (skin) | none |
| Isopropyl Benzene | none | none |
| n-Propylbenzene | none | none |
| Butylbenzene | none | none |
| Toluene | 50 | 200 |
| Trichlorofluoromethane | 1000 (ceiling) | 1000 |
| Xylene | 100 | 100 |

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point: NA

Specific Gravity: 2.5 – 2.9

Vapor Pressure (mm Hg): NA

Percent Volatile by Volume (%): 0

Vapor Density (Air = 1): NA

Evaporation Rate (butyl acet = 1): NA

Solubility in Water: None

Reactivity in Water: None as solid
Dust will react

Appearance and Odor:

Aluminum Unisub is shaped as a silver gray flat panel. It has no odor. The sublimation or engraving process can also create an odor.

FIRE AND EXPLOSION DATA -

| | | | |
|-----------------------------|---|--------------|--------------------|
| Flash Point: NA | Flammable Limits in Air % by Volume: 40 mg/L (Aluminum fines) | <u>Lower</u> | <u>Upper</u> ND |
| Extinguisher Media: Class D | Auto-Ignition Temperature: Aluminum dust may burn readily. | | |

Special Fire

Fighting Procedures: This material is an aluminum alloy. Use methods and materials appropriate for surrounding fire. Use water spray for chip fires. Use Class D extinguishing agents for dust. DO NOT USE Halogenated Agents.

Combustion products are expected to be carbon monoxide and smoke.

Unusual Fire and

Explosion Hazards: Dust dispersed in air can be explosive and can generate explosive gases if in contact with water.

SECTION 4 - PHYSICAL HAZARDS

Stability: Stable Conditions to Avoid: Do not allow build up of chips, dust or contact of chips, dust with water.

Incompatibility (Materials to Avoid): Reacts violently with halogenated hydrocarbons and oxidizers to produce heat. Reacts with acids, alkalis, and nitrates. Small particles can react with water.

Hazardous Decomposition Products: Combustion products are expected to be primarily carbon monoxide and smoke.

The actual sublimation process emits extremely small amounts of
1,3 Dichloropropene, Acetone, Chlorobenzene Ethyl Methacrylate,
Hexachlorobutadiene,
Isopropyl Benzene, n-Butylbenzene, n-Propylbenzene, Butylbenzene, Toluene,
Trichlorofluoromethane, Xylene

Hazardous Polymerization: Will not occur

SECTION 5 - HEALTH HAZARDS : -Product is a solid sheet of aluminum alloy. No hazards anticipated during handling and storage. The following information was developed for the products produced during the sublimation process

Primary Routes of Exposure: Inhalation

Signs and Symptoms of Overexposure:

Inhalation: Irritation

Eye Contact: Irritation

Skin Contact: Irritation or physical abrasion.

Ingestion: None known

Effects of Overexposure: None known, Respiratory irritation possible

Medical Conditions Generally Aggravated by Exposure: Pre-existing respiratory disease such as asthma and lung problems.

Chemical Listed as Carcinogen or Potential Carcinogen: These forms of metal alloys are not listed as carcinogens. Welding can create hexavalent chromium which is classified as a carcinogen by IARC, NTP, EPA and ACGIH.

Emergency and First Aid Procedures:

1. Inhalation: Hazard is unlikely. Remove from further exposure. Keep warm and at rest. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should administer oxygen. Seek immediate medical attention.
2. Eyes: Hazard is unlikely. Immediately flush eyes with plenty of water for two to three minutes. Remove any contact lenses and continue flushing for 15 minutes. Get immediate medical attention.
3. Skin: Hazard is unlikely. If irritation occurs wash affected area with plenty of soap and water. Seek immediate medical attention.
4. Ingestion: Hazard is unlikely. If irritation occurs wash out mouth with water, keep at rest. Seek immediate medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

Primary Routes of Exposure: Hazard is unlikely. Inhalation of decomposition products

SECTION 6 - SPECIAL PROTECTION INFORMATION :

Respiratory Protection (Specify type): Usually not necessary to reduce exposures to TLV during anticipated normal use. If requested, due to odor or if TLV is exceeded; use organic vapor filtration system with a respirator type appropriate for the exposure level. Consult industrial hygienist.

Ventilation: Usually not necessary to reduce exposures to TLV during normal use. General or local exhaust may be necessary to minimize odors in small rooms. **All confined space work should be done in accordance with OSHA 1910.146.**

Protective Gloves: Possible material handling hazard (cuts, abrasion) Use cloth or leather if necessary or requested. If solvents used consult industrial hygienist.

Eye Protection: Safety glasses required.

Other Protective Clothing or Equipment: None known.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage: None known for solid material. Dust is a fire hazard.

Other Precautions: Use sufficient local or general ventilation to reduce odors from sublimation process.

Steps to be Taken in Case Material is Released or Spilled: Use non-sparking tools or natural bristle broom for clean up of dust spills. Do not use water.

Waste Disposal Methods: This material is not specifically listed as a hazardous waste under RCRA and would normally not exhibit any characteristics of hazardous waste as specified in 40 CFR 1910 Part 261.20. If material is processed, mixed or contaminated with other materials, it may become regulated as hazardous waste and subject to RCRA regulations.