

1 - PRODUCT AND COMPANY IDENTIFICATION

Material name	CADMIUM FREE SILVER SOLDER ALLOYS
SDS number	013 version 1.1
Chemical formula	Silver, Copper, Zinc
Alloys included	450, 560, 650, 750, 800 silver solders
Product use	Fabricated sheet and wire solder for joining.
Restriction on use	Not recommended for use in the oral environment
Manufacturer information	Hoover & Strong Inc., 10700 Trade Road, N. Chesterfield, VA 23236 (804) 794 3700 (800) 759 9997 fax (800) 616 9997
Emergency Contact	(804) 794 3700 (800) 759 9997 fax (800) 616 9997

2 - HAZARDS IDENTIFICATION

Emergency overview	Metallic solid. White & Yellow colored. Non-combustible as-supplied.
Potential health effects	As-delivered, these materials pose no health hazard. If vaporized, metal fumes such as Zinc Oxide [OSHA PEL = 5mg/m ³ (fume) 15mg/m ³ (dust)] and Silver Fume [OSHA PELL = 0.1mg/m ³] may be released. Exposure to elevated concentrations of metal fumes > OSHA PEL may cause metal fume fever. Symptoms include dryness and irritation of the throat, a metallic taste in the mouth, headache, fever, chills, excessive sweating, muscle pains, nausea, vomiting & weakness, tightness in chest, decreased pulmonary function.
Eyes	Dust and fumes from processing can cause eye irritation.
Skin	A small percentage of the population may be allergic to the metals contained in these materials. Prolonged or repeated skin contact may cause localized sensitization and allergic contact dermatitis.
Carcinogenicity	All products as shipped do not present any cancer or reproductive hazards.

3 - COMPOSITION/INFORMATION ON INGREDIENTS

Compositions include some or all of the following. These may include some components classified as non-hazardous.

Component	CAS #	Content
Silver	7440-22-4	20.0 - 90.0%
Copper	7440-50-8	10.0 - 50.0%
Zinc	7440-66-6	1.0 - 35.0%

4 - FIRST AID MEASURES

Eye Contact	Dust and fumes from processing can irritate eyes. Rinse eyes with flowing water or saline solution for a minimum of 15 minutes. If symptoms persist seek medical attention.
Skin Contact	Dust and fumes from processing can irritate the skin. Wash affected areas with soap and water for a minimum of 15 minutes. If symptoms persist seek medical attention.
Inhalation	If dust or fumes from processing are inhaled, remove victim to fresh air. If breathing is labored or difficult, provide oxygen. If breathing has stopped, perform artificial respiration to supply vital functions. Provide all relevant information to rescuers.

Note: Hot and molten metal can burn. Suitable precautions must be taken to prevent this.

5 - FIRE FIGHTING MEASURES

Flammable/combustible properties	These products do not present fire or explosion hazards as-shipped.
Flashpoint	Non flammable
Auto-ignition temperature	N/A
Flammable limits in air	Lower limit - N/A Upper limit - N/A
Unusual fire and explosion hazard	Fine powder or dust may ignite at high temperatures.
Extinguishing media	While these materials are not flammable, hot/molten metal can cause ignition of surrounding materials. If this occurs, use extinguishers suitable for use on or near hot/molten metal. Class D extinguisher, dry chemical, CO ₂ , dry sand, halon
Unsuitable extinguishing media	Do not use water when fighting fires around hot/molten metal.
Special fire fighting procedures	Responders should wear eye protection and NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

6 - ACCIDENTAL RELEASE MEASURES

Spill or leak response	Spill of molten metal should be smothered with sand or any other class D extinguishing media. Notify safety personnel of spills. Clean up personnel must wear protection against inhalation of dust and fine particles. Use a vacuum with a HEPA filter to recover dust and fine particles.
Disposal	Return to manufacturer for refining. Dispose of any unsalvageable material in accordance with federal, state and local regulations.

7 - HANDLING AND STORAGE

Storage	Keep away from extreme heat.
Incompatible materials	N/A
Hazardous polymerization	Will not occur.

8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Component	CAS #	OSHA/PEL #	ACGIH/TLV #
Silver	7440-22-4	0.01 mg/m ³	0.1 mg/m ³
Copper	7440-50-8	1.0 mg/m ³	0.2 mg/m ³
Zinc	7440-66-6	5.0 mg/m ³	5.0 mg/m ³
Engineering controls	As-delivered, these materials require no engineering controls. During heating or melting, ensure adequate ventilation to meet established occupational exposure limits. Low level fume generation can be controlled by adequate room ventilation. For higher levels of fume generation, local exhaust by mechanical methods is recommended. During grinding or any special operation where dust and/or fumes may occur, approved		

	respirator protection is required. Do not blow dust off clothing or skin with compressed air.
Respiratory protection	If permissible levels are exceeded, use NIOSH approved dust respirator or air supplied personal safety helmet.
Eye protection	Use safety glasses.
Skin protection	Not normally needed. Wear impermeable gloves and protective work clothing as necessary. With hot or molten material, the use of heat resistant gloves, goggles or face shield and protective clothing to protect from hot material splash should be worn. Safety type boots are recommended.
Work/hygiene practices	Avoid inhalation or ingestion. Do not use food or tobacco in the work area. Wash thoroughly before eating or smoking.
9 - PHYSICAL AND CHEMICAL PROPERTIES	
Form	Solid
Appearance	White & Yellow colored
Odor	None
Odor threshold	None
Boiling point	Not determined
Melting point	1145°F to 1490°F
Flashpoint	N/A
pH	N/A
Specific gravity	8.8 to 10.3
Evaporation rate	N/A
Solubility	Insoluble in water
Flammability	N/A
Lower flammable limit	N/A
Upper flammable limit	N/A
Auto ignition temperature	N/A
Partition coefficient	N/A
10 - STABILITY AND REACTIVITY	
Chemical stability	Stable under normal conditions of use, storage, and transportation as-shipped.
Materials with which substance is incompatible	N/A
Hazardous polymerization	Will not occur.
Conditions to avoid	Extreme heat may cause the product to decompose releasing zinc oxide and metal fume.
11 - TOXICOLOGICAL INFORMATION	
General	To the best of our knowledge, the chemical, physical and toxicological characteristics of these materials have not been fully investigated and recorded.
Likely routes of exposure	Inhalation, skin, eyes. Product as shipped does not present an inhalation hazard. Subsequent operations may create dust and fumes.
Symptoms of exposure	May cause irritation and contact dermatitis. May cause metal fume fever symptoms if inhaled.
Acute effects	Direct contact of dust or fumes with skin or eyes may cause irritation.
Chronic effects	None known.
Acute toxicity	No data known.
Chronic toxicity	No data known.
Carcinogenicity	None of the metals contained in these materials are identified as carcinogenic.
Medical conditions aggravated by exposure	Respiratory illness, dermatitis, gastrointestinal disorders.
12 - ECOLOGICAL INFORMATION	
Ecotoxicity	No data.
Persistence and degradability	No data.
Bioaccumulative potential	No data.
Mobility in soil	No data.
Other adverse effects	No further relevant information available.
13 - DISPOSAL CONSIDERATIONS	
If the material cannot be returned to process, return to manufacturer for refining. If the material must be disposed of, package and do so in accordance with federal, state and local regulations.	
14 - TRANSPORTATION INFORMATION	
No transport restrictions known.	
15 - REGULATORY INFORMATION	
None known.	
16 - OTHER INFORMATION	
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