MATERIAL SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 PUBLIC LAW 99-499. STANDARD SHOULD BE CONSULTED FOR SPECIFIC REQUIREMENTS.

SECTION I (IDENTIFICATION)

MANUFACTURER/ SUPPLIERS NAME: **EUTECTIC CORPORATION**
N94 W14355 Garwin Mace Drive
Menomonee Falls, WI 53051 USA

TELEPHONE NUMBER:
1-800-558-8524

PRODUCT NAME: **Eutectic Shim 3**

PRODUCT CLASSIFICATION: **Brazing Filler Alloy**

SECTION II (HAZARDOUS INGREDIENTS/IDENTITY INFORMATION)

IMPORTANT: This section covers the materials from which these products are manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term "Hazardous" in "Hazardous Ingredients" should not only be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200), but also as defined by other regulatory agencies. The chemicals or compounds subject to reporting under Title III, in Section 313, of the Superfund Amendments and Reauthorization Act (SARA) are marked by the symbol #.

WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer. (California Health & Safety Code 25249.5 et seq.)

	CAS	Exposure Limit (mg/m^3)		
INGREDIENTS	**NUMBER**	**OSHA PEL**	**ACGIH-TLV**	**Percent Ingredients (by weight)**
Silver #	7440-22-4	0.01	0.01	30 – 60
Cadmium #	7440-43-9	0.005	0.002	10 – 30
Zinc #	7440-66-6	5 (as fume)	Not listed	10 – 30
Copper #	7440-50-8	0.1	0.2	10 – 30
Nickel #	7440-02-0	1	0.2	1 – 5

SECTION III (PHYSICAL DATA) - Brazing filler alloy

SECTION IV (FIRE AND EXPLOSION DATA)

Flash point: NIF **Flammable limits in air (% by volume)**: NIF
Extinguishing media: water, dry chemical extinguisher, CO_2 **Special fire fighting procedures**: Low-pressure extinguisher.
Unusual fire and explosion hazards: Use NIOSH/MSHA self contained breathing apparatus. Thermal decomposition may produce heavy brown smoke and CdO fumes - highly toxic. Rating under National Fire Protection 704: Health, 3; Flammability, 0; Reactivity, 0.

SECTION V (REACTIVITY DATA)

Stability considerations : stable
Hazardous polymerization: will not occur.
Incompatibility: Materials to avoid: Mineral acids and/or caustic solutions. Cadmium dust reacts vigorously with oxidizing materials. Incompatible with sulfur, selenium, and tellurium.
Hazardous combustion or decomposition products: ZnO fumes (zinc) and CdO fumes (cadmium).

Brazing fumes cannot be classified simply. The composition and quantity of both are dependent upon the metal being brazed, the process, procedure, and the product used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being brazed (such as paint, plating, or galvanizing), the number of workers and the volume of the work area, the quality and the amount of ventilation, position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the alloy is consumed, fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Fume and decomposition products, not the ingredients in the rod, are important. Decomposition products include those originating from the volatilization, reaction, or oxidation of materials in Section II, plus those from the base metal and coating, etc., as noted above. These components are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society). Reasonably expected fume constituents of the fume could include complex oxides of nickel, cadmium, zinc and copper. The table below lists reasonably expected fumes that may be generated:

Substance	**CAS No.**	**OSHA PEL**	**ACGIH TLV**
Nickel Oxide #	1313-99-1	1 (as Ni)	0.2 (as Ni)

Gaseous reaction products may include carbon monoxide and carbon dioxide. **Monitor fume levels.** One recommended way to determine the composition and quantity of fumes and gas to which workers are exposed is to take an air sample inside the welder's helmet if worn, or in the worker's breathing zone (see ANSI/AWS F1.1, F1.2, F1.3, F1.4, and F1.5, available from the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126).

SECTION VI (HEALTH HAZARD DATA)

SHORT TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. **PRIMARY ROUTE OF ENTRY** is the respiratory system. **NICKEL, NICKEL OXIDE** - May cause metallic taste, nausea, tightness in chest, fever, and allergic reactions. **SILVER**: Chronic exposure via inhalation may cause argyria. **ZINC**: Acute exposure to zinc oxide fumes may cause respiratory tract infection and "metal fume fever", which is characterized by cough, metallic taste, dry throat, chills, fever, headache, tightness of chest, nausea, shortness of breath, vomiting, and fatigue. Excessive zinc intake has been associated with copper deficiency anemia.
COPPER: Individuals with Wilson's Disease are at increased risk of COPPER poisoning. Copper poisoning can result in hemolytic anemia and kidney, liver, and spleen damage. Acute (short-term) exposure may cause respiratory tract irritation, fever, muscle ache, chills, weakness, cough, and a metallic taste.
INHALATION may cause respiratory tract and mucous membrane irritation. Symptoms include nasal discharge and nosebleeds, coughing, sore throat and labored breathing. Severe exposure may cause bronchospasm and pulmonary edema. Absorption may cause systemic poisoning similar to that which occurs with ingestion. Inhalations of fumes may cause a flu-like illness called 'metal fume fever'. Typically metal fume fever begins four to twelve hours after sufficient exposure to freshly formed fumes. First symptoms are a metallic taste, dryness, and irritation of the throat. Cough and shortness of breath may occur along with a headache, fatigue, nausea, vomiting, diarrhea, and painful spasms of the limbs.
Cadmium fume produces **METAL FUME FEVER** which may result in severe tracheobronchitis, pneumonitis, pulmonary edema (throat dryness, cough, headache, vomiting, chest pains, and chills). Suspected acute inhalation exposure to Cd must be treated for pulmonary edema by a physician. Delay until onset of pulmonary involvement may result in death. Cadmium is transported via blood and stored in liver and kidneys. Can cause kidney damage. **AVOID DIRECT INHALATION OF FUMES DURING HEATING. AVOID INHALATION OR INGESTION OF DUST. DO NOT ALLOW DUST TO ACCUMULATE. MONITOR FUME LEVELS.**

LONG TERM (CHRONIC) OVEREXPOSURE - **PHYSIOLOGICAL EFFECTS**: Chronic inhalation of cadmium oxide dusts and fumes has caused tubular dysfunction as evidenced by protainuria. Other disorders have included pulmonary emphysema, anemia, bone demineralization, and impotency.
PRIMARY ROUTE OF ENTRY is the respiratory system. **INHALATION** of fumes may cause respiratory tract and mucous membrane irritation. Symptoms include nasal discharge and nosebleeds, coughing, sore throat and labored breathing. Severe exposure may cause bronchospasm and pulmonary edema. Absorption may cause systemic poisoning similar to that which occurs with ingestion. Inhalation of fumes may cause a flu-like illness called 'metal fume fever'. Typically metal fume fever begins four to twelve hours after sufficient exposure to freshly formed fumes. First symptoms are a metallic taste, dryness, and irritation of the throat. Cough and shortness of breath may occur along with a headache, fatigue, nausea, vomiting, diarrhea, and painful spasms of the limbs. **COPPER** may damage the liver, kidney, spleen, pancreas, and brain. Ingestion of large amounts may be fatal. **NICKEL, NICKEL OXIDE** - Long term overexposure to nickel products may cause lung fibrosis or pneumoconiosis.

EMERGENCY & FIRST AID PROCEDURES - Call for medical aid! Employ first aid techniques recommended by the American Red Cross.

Swallowing: Call a physician at once or your poison control center. Advise of Section II immediately. Drink large quantities of water - induce vomiting.
Skin: Promptly flush with water to remove all residue. If rash develops, consult a physician.
Inhalation: Terminate exposure and remove to fresh air. Call a physician immediately and advise of chemical composition (Section II).
Eyes: Flush with water for at least 15 minutes to remove all residue. Get medical help immediately.

CARCINOGENICITY
NICKEL - is listed as being carcinogenic to humans on **IARC** and **NTP** lists, and is listed by **NIOSH** as being a potential occupational carcinogen (with no further categorization).
CADMIUM - is listed as being carcinogenic to humans on **IARC** and **NTP** lists, and is listed by **NIOSH** as being a potential occupational carcinogen (with no further categorization).
WELDING FUMES (not otherwise specified) are considered to be carcinogenic defined with no further categorization by **NIOSH** and **IARC**.

SECTION VII (STORAGE, HANDLING AND SPECIAL PRECAUTIONS)

Read and understand the manufacturer's instructions and precautionary label on this product.
See American National Standard Z49.1, Safety in Welding and Cutting, published by the "American Welding Society," 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on the following:

Respiratory protection: Use a NIOSH approved respirator where dust, fumes or smoke exist. Monitor fume levels.
Ventilation: Maintain air flow away from the user to remove all fumes and vapors, so that the TLV is never exceeded. Adhere to environmental regulations for exhausts.
Protective gloves: Recommended.
Eye protection: Safety goggles for protection against dust/splash.
Other protective equipment: Full protective equipment normally used in brazing operation so as to prevent any contact.
Precautions to be taken in handling and storage. Store product at ambient conditions. Avoid wet or moist conditions. Wash thoroughly after handling to remove all residue.
Other precautions: Do **NOT** breathe fumes. Professionally wash contaminated clothing before re-use. Food and drink should not be consumed or tobacco products used, nor cosmetics applied in area where metal exposures are possible.
Waste: Dispose of any waste residues in closed containers. Be recognizant of potential FEDERAL, STATE, LOCAL, and OSHA regulations regarding cadmium. Vacuuming is strongly recommended for accumulated dust. Metal is recyclable. Conform to applicable regulations.

Exposure limits are subject to change. Contact ACGIH, OSHA, NIOSH, and IARC for current values.
