

Safety Data Sheet

1. Supplier and product

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Product: Bronze (Copper-based) Alloys Code: ERCuSi-A, ERCuAl-A1,2,3, ERCuSn-A,C, ERCuNi

Product Identification: AWS A5.7

Product size: Variable

Product Use(s): Metal welding

2. Hazards identification

Classification(s)

GHS Classified: The product is not classified as hazardous according to the Globally Harmonized System (GHS).

GHS Label Symbol(s): Not regulated

GHS Label Signal Word(s): Not Regulated

GHS Label Hazard Statement(s): Not regulated.

GHS Precautionary statements: Not regulated.

Other hazards which do not result in GHS classification:

WARNING: PROTECT yourself and others. Read and understand this information. Overexposure to brazing or welding fumes and gases can be

hazardous to your health. HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure your eyes. Before Use, read and understand

the manufacturer's instructions. Safety Data Sheets (SDSs), and your employer's safety policies. Keep your head out of the fumes. Use enough

ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area. · Wear correct eye, ear, and body protection.

Other Hazards: These products consist of bare or coated, odorless bronze rods. There are no immediate health hazards associated with these products. These products are not flammable nor reactive. If involved in a fire, these products may generate

irritating fumes and a variety of metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

3. Composition/information on ingredients

Note: The percentage by weight values for the ingredients in this product represent approximate formulation values

Ingredient	CAS Number	% wt.	GHS note
Copper (Cu)	7440-50-8	45-99	
Aluminum (Al)	7440-50-8	0-12	
Iron (Fe)	7439*89-6	0-6	Acute Tox 4 (oral): H302
Manganese (Mn)	7439-96-5	0-14	
Nickel	7440-02-0	0-31	Skin Sens 1: H317; Carc 1B: H350; STOT RE 1: H372
Silicon	7440-21-3	0-1	

Composition comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a hazard. The product may contain additional nonhazardous ingredients or may form additional compounds under the condition of use.

4. First aid measures

Description of First Aid Measures

Inhalation: Remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

Skin: Immediately begin decontamination with cold, running water. Minimum flushing is for 15 minutes. Victim must seek medical

attention if any adverse reaction occurs.

Eye: Open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

Ingestion: If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

Note to Physician: Treat symptoms and eliminate overexposure.

Most Important Symptoms and Effects Both Acute and Delayed

General: Welding, cutting, or processing this material may release dust or fumes that are hazardous. During processing, inhalation of fumes may cause dizziness and/or irritation to the eyes, nose, and throat. Hot molten product will cause thermal burns to the skin.

Inhalation: Short-term (acute) overexposure to gases, fumes, and dusts may include irritation of the eyes, lungs, nose, and throat.

Some toxic gases may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as water eyes, nose and throat irritation, headache, dizziness, difficulty in breath, frequent coughing, or chest pain. The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever, and allergic reactions. Excessive inhalation or ingestion of manganese can produce manganese poisoning. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances, and spastic gait resembling Parkinsonism. These symptoms can become progressive and permanent if not treated. Excessive inhalation of fumes may cause "Metal Fume Fever" with flu-like symptoms such as chills, fever, body aches, vomiting, sweating.

Skin Contact: May cause irritation. Contact with hot, molten metal will cause thermal burns.

Eye Contact: Fumes from thermal decomposition may cause eye irritation. Risk of thermal burns on contact with molten product.

Arc rays and sparks can burn eyes.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

5 Fire-fighting measures

Extinguishing media:

Suitable Extinguishing Media: Use extinguishing agents appropriate for surrounding materials.

Unsuitable Extinguishing Media: None

Special hazards arising from the substance or mixture:

Fire Hazard: Not considered flammable.

Explosion Hazard: Product is not explosive. Ensure proper welding procedures to avoid welding explosions.

Reactivity: None under normal conditions. Metallic dusts may ignite or explode.

Advice for firefighters:

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not breathe fumes from fires or vapors from decomposition.

Protection During Firefighting: Use proper protective equipment, including respiratory protection.

Hazardous Combustion Products: The hot material can present a significant thermal hazard to firefighters

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures:

General Measures: No additional information available.

For Non-Emergency Personnel

Protective Equipment: No additional information available.

Emergency Procedures: No additional information available..

For Emergency Personnel

Protective Equipment: No additional information available.

Emergency Procedures: No additional information available.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: No special requirements.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Avoid generation of dust during clean-up of spills. Ventilate area. Do not mix with other materials. Transfer spilled material to a suitable container for recycling or appropriate disposal.

7 Handling and storage

Precautions for Safe Handling

Use proper ventilation and respiration apparatus; eye, hand, and body protection as necessary. Avoid generating dust/fumes.

Additional Hazards When Processed: Risk of electric shock when welding. Arc rays and sparks can burn skin. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society and OSHA Hazard Communication Standard 1910.1200 for additional details regarding the handling and storage of this material.

Precautions for Safe Handling: Use appropriate personal protective equipment when handling and observe good personal hygiene measures after handling.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed

areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Store in a dry, cool place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Materials: See section 10.

8 Exposure controls/personal protection

Ingredients – Exposure Limits

Ingredient	CAS #	ACGIH TLV (mg/m3)	OSHA PEL (mg/m3)	Carc.
Aluminum	7429-90-5	1 (resp)	15 (total dust), 5 (resp)	A4
Copper	7440-50-8	0.2 (fume), 1 (total dust)	0.1 (fume), 1 (total dust)	EPA: D
Iron	7439-89-6	5 (fume)	10 (fume)	A4
Lead	7439-92-1	0.05	0.05	IARC 2B, A3, NTP: R
Manganese	7439-96-5	0.02 (resp)	5 (fume ceiling)	
Nickel	7440-02-0	1.5	1	IARC 2B, EPA: A
Phosphorus	7723-14-0	0.1	0.1	EPA: D
Silicon	7440-21-3	10 (total dust)	15 (total dust), 5 (resp)	
Silver	7440-22-4	0.1	0.01	EPA: D
Tin	7440-31-5	2	2	
Zinc (as oxide limits)	7440-66-6	2 (fume)	5 (fume), 15 (total dust)	EPA: D

Exposure controls:

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. All equipment should comply with the National Electric Code. When cutting, grinding, crushing, or drilling, provide general or local ventilation systems, as needed, to maintain airborne dust concentrations below the regulatory limits. Local vacuum

collection is preferred since it prevents release of contaminants into the work area by controlling it at the source. Other technologies that may aid in controlling airborne respirable dust include wet suppression, ventilation, process enclosure, and enclosed employee work stations. Prevent dust accumulation.

Personal Protective Equipment: Gloves. Protective clothing. Face shield. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: With molten material wear thermally protective clothing.

Hand Protection: Appropriate welding or heat resistant gloves.

Eye Protection: Welders should wear goggles or safety glasses with side shields that comply with ANSI Z87.1 under welding helmets and always wear goggles or other suitable eye protection when gas welding or oxygen cutting.

Skin and Body Protection: Wear fire/flame resistant/retardant clothing appropriate for task.

Respiratory Protection: Wear approved respiratory apparatus appropriate for task.

Consumer Exposure Controls: Do not eat, drink or smoke during use.

9. Physical and chemical properties

The following information pertains to copper, a main component of this product, unless otherwise indicated:

Physical state: Solid	Appearance: metallic rod or wire, bare or coated
Odor: none	Odor threshold: n/a
pH: n/a	Evaporation rate: n/a
Melting point: 630 - 1150 C (1200 - 2100 F)	Freezing point: n/a
Boiling point (@ 24 mm Hg): 2595 C (4703 F)	Flash point: n/a
Auto-ignition temperature: n/a	Decomposition temperature: n/a
Flammability (solid, gas): n/a	Lower flammable limit: n/a
Upper flammable limit: n/a	Vapor pressure: n/a
Relative vapor density at 20C: n/a	Relative density: n/a
Specific gravity @ 20C (water = 1): 8.3 - 8.9 g/cc	Solubility in water: Insoluble
Partition coefficient (N-octanol/water): n/a	Viscosity: n/a
Explosion - sensitivity to mechanical impact: not expected to present an explosion hazard due to mechanical impact	Explosion - sensitivity to static discharge: not expected to present an explosion hazard due to static discharge

Other information: No additional information available

10. Stability and reactivity

Products as shipped are non-hazardous, nonflammable, non-explosive, and nonreactive.

Reactivity: No additional information available.

Chemical stability: The product is stable under normal conditions. When using it may produce dangerous fumes and gases.

Possibility of hazardous reactions: Will not occur.

Conditions to avoid: None

Incompatible materials: None

Hazardous decomposition products: Metal oxides. Copper and Zinc compounds. Fume constituents may include: complex oxides or iron, manganese, silicon, chromium, nickel, columbium, molybdenum, copper, carbon dioxide, carbon monoxide, ozone and nitrogen oxides. Certain products may also include: antimony, barium, molybdenum, aluminum, columbium, magnesium, strontium, tungsten, zirconium, or zinc oxides. Fume limits for individual components may be reached before limit of 5 mg/m³ of general welding fumes is reached. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

NOTE: The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, the procedure, and the electrodes used. Other conditions that could also influence the composition and quantity of fumes and gases to which workers may be exposed include the following: any coatings on metal being welded (e.g., paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality of ventilation, the position of the welder's head with respect to the fume plume, and the presence of other contaminants in the atmosphere. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2 (Composition and Information on Ingredients). Fume and gas decomposition products, and not the ingredients in the electrode, are important.

Concentration of the given fume or gas component may decrease or increase by many times the original concentration. New compounds in the electrode may form. Decomposition products of normal operations include not only those originating from

volatilization, reaction, or oxidation of the product’s components but also those from base metals and any coating (as noted previously). The best method to determine the actual composition of generated fumes and gases is to take an air sample from inside the welder’s helmet if worn or if worn or in breathing zone. For additional information, refer to the American Welding Society Publication, “Fumes and Gases in the Welding Environment”.

11. Toxicological information

Information on Toxicological Effects – Product

Acute Toxicity: Not classified	LD50 and LC50 Data: Not available
Skin Corrosion/Irritation: Not classified	Serious Eye Damage/Irritation: Not classified
Respiratory or Skin Sensitization: Not classified	Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available	Carcinogenicity: Not classified.
Specific Target Organ Toxicity (Repeated Exposure): Not classified	Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified.	Aspiration Hazard: Not classified

Irritancy of product: Dusts or fumes of these products may be irritating to contaminated skin and eyes. Fumes may be irritating to the respiratory system.

Sensitization to the product: These products are not known to be skin or respiratory sensitizers.

Reproductive toxicity information: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: These components are not reported to produce mutagenic effects in humans. Animal mutation data are available for Boric Acid and Nickel (constituents of some of these products).

Embryotoxicity: These products are not reported to produce embryotoxic effects in humans.

Teratogenicity: These components are not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Copper and Nickel components of some of these products indicate teratogenic effects.

Reproductive Toxicity: These components are not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Boric Acid, Copper, and Phosphorus components of some of these products indicate adverse reproductive effects

Biological exposure indices: There may be BEI determined for the flux component in some of these products.

12. Ecological information

Manganese	NOEC chronic fish: 3.6 mg/L (Exposure time: 96h - Species: Oncorhynchus mykiss)
Iron	LC50 Fish: 0.56 mg/L (96h - Cyprinus carpio)
Nickel	LC50 Fish 1: >100 mg/L (96h - Brachydanio rerio) EC50 Daphnia 1: >100 mg/L (48h - Daphnia magna) EC50 other aquatic organisms 1: 0.18 mg/L (72h - Pseudokirchneriella subcapitata) LC50 Fish 2: 1.3 mg/L (96h - Cyprinus carpio [semi-static]) EC50 Daphnia 2: 1 mg/L (48h - Daphnia magna [static]) EC50 other aquatic organisms 2: 0.174- 0.311 mg/L (96h - Pseudokirchneriella subcapitata [static])
Copper	LC50 Fish 1: 0.0068-0.0156 mg/L (96h - Pimephales promelas) EC50 Daphnia 1: 0.03 mg/L (48h - Daphnia magna [static]) EC50 other aquatic organisms 1: 0.0426 - 0.0535 mg/L (72h - Pseudokirchneriella subcapitata [static]) LC50 Fish 2: <0.3 mg/L (96h - Pimephales promelas [static]) EC50 other aquatic organisms 2: 0.031 - 0.054 mg/L (96h - Pseudokirchneriella subcapitata [static])
Silver	LC50 Fish 1: 0.00155 - 0.00293 mg/L (96h - Pimephales promelas [static]) EC50 Daphnia 1: 0.00024 mg/L (48h - Daphnia magna [static]) LC50 Fish 2: 0.0062 mg/L (96h - Oncorhynchus mykiss [flow-through])
Lead	LC50 Fish 1: 0.44 mg/L (96h - Cyprinus carpio [semi-static]) EC50 Daphnia1: 600 microg/L (48h - water flea) LC50 Fish 2: 1.17 mg/L (96h - Oncorhynchus mykiss [flow-through])
Boric Acid	LC50 (trout eggs) = 100 ppm/ soft ; LC50 (trout eggs) = 79 ppm/ hard LC50 (catfish eggs) = 155 ppm/ soft; LC50 (catfish eggs) = 22 ppm/ hard LC50 (goldfish eggs) = 46 ppm/ soft; LC50 (goldfish eggs) = 75 ppm/ hard

Toxicity: Ecology - general: Toxic to aquatic life**Persistence and Degradability:** The components of these products are expected to persist in the environment for an extended period of time..**Bioaccumulative:** No additional information available.**Mobility in Soil:** No additional information available.**Other Adverse Effects:** No additional information available**13. Disposal considerations**

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Recycle where possible and/or dispose of spent material such as metals & metal-bearing waste and submerged arc welding (SAW) flux/slag appropriately.

EPA Waste Number: Not applicable.

14. Transport information

THIS MATERIAL IS NOT HAZARDOUS (Per 49 CFR 172.101) BY THE U.S. DEPARTMENT OF TRANSPORTATION.

Transport is not regulated in accordance with: USDOT, TDG (Canada), IATA, or IMDG.

UN Identification Number: Not Applicable

15. Regulatory information

Silicon	Listed on the United States TSCA (Toxic Substances Control Act) inventory
Manganese	Listed on the United States TSCA (Toxic Substances Control Act) inventory; Listed on United States SARA Section 313 SARA Section 313 - Emission Reporting: 1.0%
Iron	Listed on United States TSCA (Toxic Substances Control Act) inventory
Copper	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 1.0% SARA Section 304 (40 CFR Table 302.4)
Nickel	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 0.1% SARA Section 304 (40 CFR Table 302.4)
Aluminum	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 1.0%
Tin	Listed on United States TSCA (Toxic Substances Control Act) inventory
Zinc	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - fume/dust SARA Section 304 (40 CFR Table 302.4)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains information required by CPR.

WARNING: This product may contain chemicals, and when used for welding or brazing may produce fumes or gases containing chemicals known to the state of California to cause cancer, and/or birth defects (or other reproductive harm).

16. Other information including information on preparation and revision of the SDS

NFPA Health Hazard: 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given NFPA Fire Hazard: 0 - Materials that will not burn NFPA Reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water	HMIS III Rating Moderate Hazard - Temporary or minor injury may occur Flammability: 0 Minimal Hazard Physical: 0 Minimal Hazard Health: 1
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