SECTION I - PRODUCT IDENTIFICATION
Copper metal, powder and pieces

<table>
<thead>
<tr>
<th>MANUFACTURER NAME AND ADDRESS:</th>
<th>TELEPHONE NUMBERS:</th>
<th>DATES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurt J. Lesker Co</td>
<td>CHEMTREC</td>
<td></td>
</tr>
<tr>
<td>P.O. Box 10</td>
<td>(800)424-9300</td>
<td></td>
</tr>
<tr>
<td>1925 Route 51</td>
<td>(703)527-3887 (outside USA)</td>
<td></td>
</tr>
<tr>
<td>Clairton, PA 15025</td>
<td>US National Poison Hotline</td>
<td>(800)222-1222</td>
</tr>
<tr>
<td>UPC/EAN: 231-159-6</td>
<td></td>
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</tbody>
</table>

SYNONYMS
Copper metal; allbri natural copper; ANAC 110; Arwood copper; bronze powder

CHEMICAL FAMILY: Metal

DOT HAZARD LABEL: No data.

FORMULA: Cu

MOLECULAR WEIGHT: 63.54

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION
Copper metal, powder and pieces

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS (CHEMICAL NAME)</th>
<th>NAME:</th>
<th>CAS #:</th>
<th>RTECS #:</th>
<th>PERCENTAGE:</th>
<th>OSHA PEL:</th>
<th>ACGIH TLV:</th>
<th>OTHER LIMITS</th>
<th>SEC.302 (EHS):</th>
<th>SEC.304 RQ:</th>
<th>SEC.313:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>Copper</td>
<td>7440-50-8</td>
<td>GL5325000</td>
<td>0.0 - 100.0 %</td>
<td>0.1 mg/m3</td>
<td>0.2 mg/m3</td>
<td>NE</td>
<td>No</td>
<td>Yes 5000 LB</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>See SECTION IX-ADDITIONAL COMMENTS FOR COSHH Regulations</td>
<td>NA</td>
<td>NA</td>
<td>0.0 - 100.0 %</td>
<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS
Copper metal, powder and pieces
PHYSICAL STATES:
[ ] Gas, [ ] Liquid, [X] Solid

BOILING POINT:
2324.00 C (4215.2 F) to 2595.00

MELTING POINT:
1083.00 C (1981.4 F)

SPECIFIC GRAVITY (WATER = 1):
8.92

DENSITY:
No data.

VAPOR PRESSURE (VS. AIR OR MM HG):
1 mm at 1628.0 C (2962.4 F)

VAPOR DENSITY (VS. AIR = 1):
No data.

EVAPORATION RATE (VS BUTYL ACETATE=1):
No data.

SOLUBILITY IN WATER:
insoluble

PERCENT VOLATILE:
N.A.

PH:
No data.

APPEARANCE AND ODOR

Reddish brown powder and pieces, no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA
Copper metal, powder and pieces

FLASH PT: N.A.
METHOD USED: NON-FLAMMABLE
EXPLOSIVE LIMITS: LEL: NA UEL: NA

EXTINGUISHING MEDIA

AUTOIGNITION TEMPERATURE: 700C (cloud)
USE: Not applicable. Use suitable extinguishing media for surrounding materials and type of fire.

SPECIAL FIRE FIGHTING PROCEDURES

Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

UNUSUAL FIRE AND EXPLOSION HAZARDS

May ignite on contact with chlorine; chlorine trifluoride; fluorine; and hydrazinium nitrate.
May react violently with C2H2; bromates; chlorates; iodates; (Cl2+OF2); dimethyl sulfoxide+trichloroacetic acid; ethylene oxide; H2O2; hydrazine mononitrate; hydrozoic acid; H2S+air; Pb(N3)2; K2O2; NaN3; Na2O2; and sulfuric acid.
May have a potentially explosive reaction with acetylenic compounds; 3-bromopropyne; ethylene oxide; lead azide; and ammonium nitrate.
Powders below 50 micron size range are not easily ignited by sparks and are weakly explosive in air.

SECTION V - REACTIVITY DATA
Copper metal, powder and pieces

STABILITY: Unstable [ ] Stable [X]

CONDITIONS TO AVOID - INSTABILITY

None

INCOMPATIBILITY - MATERIALS TO AVOID
HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Oxides of copper.

HAZARDOUS POLYMERIZATION: Will occur [ X ] Will not occur [ ]

CONDITIONS TO AVOID - HAZARDOUS POLYMERIZATION

Hazardous polymerization can occur, on long standing a white highly explosive peroxide deposit may form. Avoid prolonged exposure to air or moisture.

SECTION VI - HEALTH HAZARD DATA

Copper metal, powder and pieces

ROUTE(S) OF ENTRY: Inhalation? Yes , Skin? Yes , Eyes? Yes , Ingestion? Yes , Other: N

HEALTH HAZARDS (ACUTE AND CHRONIC)

Copper compounds: In animals, inhalation of copper dust has caused hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, and injury to the lung cells; injection of the dust has caused cirrhosis of the liver and pancreas, and a condition closely resembling hemochromatosis or bronzed diabetes. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

INHALATION:
Acute: May cause irritation to the respiratory tract, metal fume fever, allergic reaction, high temperature, metallic taste, nausea, coughing, general weakness, muscle aches, exhaustion, skin discoloration, nausea, vomiting, abdominal pain, diarrhea, stomach and intestine ulceration, jaundice, kidney and liver damage.
Chronic: May cause degeneration of mucous membrane, discoloration of the skin and hair, respiratory disease, ulceration and perforation of the nasal septum and pharyngeal congestion.

INGESTION:
Acute: Poison by intraperitoneal route. May cause acute copper toxicity.
Chronic: May cause irritation to the gastrointestinal tract and chronic copper toxicity. May cause damage to the nervous system, kidneys and enlarge the liver.

SKIN: Acute: May cause irritation.
Chronic: May cause dermatitis.

EYE: Acute: May cause irritation to the conjunctiva.
Chronic: No chronic health effects recorded.

TARGET ORGANS: May affect the respiratory system, skin, liver central nervous system, and kidneys.

CARCINOGENICITY: NTP? No , IARC Monographs? No , OSHA Regulated? No

CARCINOGENICITY/OTHER INFORMATION
Questionable carcinogen with experimental teratogenic and reproductive effects.

---------------------- COPPER OTHER TOXICITY DATA ---------------------

orl-rat TDLO: 152 mg/kg(22W pre):TER iut-rat TDLO: 250 ug/kg(female ID pre):REP ipl-rat TDLO: 100 mg/kg;ETA orl-hmn TDLO: 120 ug/kg;GIT
ipr-mus LD50: 3500 ug/kg

RECOMMENDED EXPOSURE LIMITS: See "Section II"
**LD 50/LC 50:** See "Carcinogenicity/Other Information"

**SIGNS AND SYMPTOMS OF EXPOSURE**

**INHALATION:** May cause a red, dry throat, metallic taste in mouth, congestion of the nasal and pharyngeal, sneezing, headache, excitability, dizziness and difficulty breathing.

**INGESTION:** Acute copper toxicity may cause: fever, tachycardia, hypotension, hemolytic anemia with intravascular hemolysis, oliguria, uremia, coma and cardiovascular collapse. Chronic copper toxicity may cause: nausea, vomiting, epigastric pain, yellow watery diarrhea, dizziness, general debility, jaundice, and green stools, saliva and vomitus.

**SKIN:** May cause redness, itching and swelling.

**EYE:** May cause redness, itching, burning and watering.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**

Pre-existing respiratory, gastric disorders and an increased risk for individuals with Wilson's disease.

**EMERGENCY AND FIRST AID PROCEDURES**

**INHALATION:** Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.

**INGESTION:** Give 1-2 glasses of milk or water and induce vomiting; seek medical attention immediately. Never induce vomiting or give anything by mouth to an unconscious person.

**SKIN:** Remove contaminated clothing; brush material off skin; wash affected area with mild soap and water; seek medical attention if symptoms persist.

**EYE:** Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

**NOTE TO PHYSICIAN**

No data available.

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**SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE**

*Copper metal, powder and pieces*

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Wear appropriate respiratory and protective equipment specified in section VIII-control measures. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

**WASTE DISPOSAL METHOD**

Dispose of in accordance with local, state and federal regulations.

**HAZARD LABEL INFORMATION:**

Store in cool, dry area Store in tightly sealed container

Wash thoroughly after handling
PRECAUTIONS TO BE TAKEN IN HANDLING

None

PRECAUTIONS TO BE TAKEN IN STORING

None

OTHER PRECAUTIONS

None

SECTION VIII - CONTROL MEASURES
Copper metal, powder and pieces

PROTECTIVE EQUIPMENT SUMMARY - HAZARD LABEL INFORMATION:
NIOSH approved respirator  Impervious gloves  Safety glasses
Clothes to prevent skin contact

RESPIRATORY EQUIPMENT (SPECIFY TYPE)
NIOSH approved respirator

VENTILATION
Local Exhaust: Local exhaust ventilation may be necessary to control any air contaminants to within their PELs or TLVs during the use of this product.
Special: None
Mechanical (Gen): Good general ventilation is recommended.
Other: None

EYE PROTECTION
Safety glasses

PROTECTIVE GLOVES
Rubber gloves

OTHER PROTECTIVE CLOTHING
Protective gear suitable to prevent contamination

WORK/HYGIENIC/MAINTENANCE PRACTICES
Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.

SECTION IX - ADDITIONAL COMMENTS
Copper metal, powder and pieces

Control of Substances Hazardous to Health Regulations
EH40 Occupational Exposure Limits

Maximum Exposure Limit: NE
Occupational Exposure Standard: 1 mg/m³
2 mg/m³ Short-term Exposure Limit

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Abbreviations used: NA=Not Applicable NE: Not Established