

SECTION 1 - HAZARDOUS INGREDIENTS
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<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>LC50, ppm (inhalation, rat)</u>	<u>LD50, mg/kg (Oral, rat)</u>
Oxygen-free copper	#1100			
Copper	7440-50-8	99.90-99.95	N/Av	N/Av
Oxygen	7782-44-7	0.00-0.05	N/Av	N/Av
Tellurium Copper				
Copper	7440-50-8	99.90-99.95	N/Av	N/Av
Tellurium	13494-80-9	0.00-0.50	>2420 mg/m ³ /4H	45 (gpg)
Phosphorus	7723-14-0	0.008	N/Av	3.03

SECTION 2 - PREPARATION INFORMATION
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Prepared by: Thermal Dynamics Corporation

Telephone #: 603-298-5711

Preparation date: November 19, 2003

SECTION 3 - PRODUCT IDENTIFICATION

Product identifier (alloys): Copper

Product use: Cutting and welding tips and electrode bodies

Supplier name and address:

Manufacturer name and address:

Thermal Dynamics Corporation
82 Benning Street
West Lebanon, New Hampshire 03784
Telephone: 603-298-5711

N/A (multiple vendors)

Emergency Telephone #: CHEMTREC 800 424 9300 USA / CANADA
703 527 3887 INTERNATIONAL

HMIS Rating: Health - 1*; Flammability - 0; Reactivity - 0

SECTION 4 - PHYSICAL DATA

- **Physical state, odor and appearance:** Solid, silver or yellow to reddish in color; no odor
- **Odor threshold:** N/Av
- **Specific gravity:** 7.5-9.0
- **Coefficient of water/oil distribution:** N/Av
- **Vapor pressure (mm Hg @ 20°C):** N/Av
- **Boiling point:** N/Av
- **Melting point:** N/Av
- **pH:** N/Av
- **Vapor density (Air=1.0):** N/Av
- **Evaporation rate (n-BuAc=1.0):** N/Av

- **Volatiles, %:** None
- **Solubility in water:** Insoluble in water; soluble in acids.

SECTION 5 - FIRE AND EXPLOSION DATA

- **Conditions of flammability:** Product is not normally a fire hazard. However, dusts of this may be ignited if exposed to an extremely strong ignition source.
- **Means of extinction:** On fires involving fine metallic dusts, use a powder (dry chemical) extinguisher or smother with an inert solid such as sand. Never use water as an extinguishing agent. Water reacts violently with molten metal.
- **Sensitivity to mechanical impact/static discharge:** Not susceptible to mechanical impact or static discharge under normal conditions.
- **Flash point (Method):** N/Ap
- **Lower/upper flammable limits (% by volume):** N/Ap
- **Auto-ignition temperature:** N/Av
- **Hazardous combustion products:** Normally not a fire hazard. If ignited, may give off fumes of copper oxides or copper vapors.

SECTION 6 - REACTIVITY DATA

- **Stability:** Stable. Hazardous polymerization will not occur.
- **Incompatible materials:** Incompatible with strong oxidizers, acids and bases, acetylenic compounds; ethylene oxide, sulphuric acid.
- **Conditions of reactivity:** Extremely high temperatures or contact with incompatibles. Liquid copper explodes on contact with water.
- **Hazardous decomposition products:** Product may give off copper oxides when heated during use (see "Hazardous combustion products"); may give off hydrogen gas (highly flammable and potentially explosive) on exposure to acids. Welding may produce toxic gases such as ozone and oxides of nitrogen.

SECTION 7 - TOXICOLOGICAL PROPERTIES

Routes of exposure and acute/chronic effects

- **Exposure limits:** ACGIH-TLV: 0.2 mg/m³ Copper as Cu fume; 1.0 mg/m³ (Cu) as dust or mist; 0.1 mg/m³ Tellurium and compounds, as Te.
- **Routes of entry:** Under normal handling conditions, the solid alloy presents no significant health hazards; however, processing of the alloy into a dust or fume by grinding, buffing, forging, welding, etc. may result in exposure to airborne metal particles which may be inhaled, or contact the eyes or skin.
- **Inhalation:** Exposure to copper dust and fume causes irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.
- **Skin contact:** None under normal conditions
- **Eye contact:** Contact with dust or fumes may cause irritation.
- **Ingestion:** Unlikely to occur; effects not known, but unlikely to cause serious illness.
- **Chronic effects:** Although industrial dermatitis has not been reported, keratinization of the hands and the soles of the feet has been reported, as well as skin discoloration. When copper is released as the oxide fume, as may happen during welding, it may cause "metal fume fever", with symptoms of nasal congestion and body aches, similar to influenza. Onset of symptoms may be delayed 4-12 hours and include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste in the mouth, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin.

These symptoms go away in 24-48 hours and leave no permanent effect. Inhalation of copper dusts or fumes has caused damage to red blood cells in animals.

- **Carcinogenicity:** Copper is not listed as a carcinogen by IARC or ACGIH.
- **Teratogenicity, mutagenicity, other reproductive effects:** Copper has been used in intrauterine devices to prevent pregnancy. Other reproductive effects are unknown.
- **Sensitization to material:** Copper is not normally a sensitizer, although allergies to copper have been reported.
- **Synergistic materials:** Exposure to other lung irritants, such as dust or tobacco smoke, may increase lung irritation from this material.

SECTION 8 - FIRST AID

- **Inhalation:** If high levels of dust or fume are inhaled, remove victim to fresh air. If breathing difficulty does not improve rapidly, get patient to a doctor. Give artificial respiration if breathing stops.
- **Skin:** Wash skin with mild soap and water. Rinse thoroughly. See a doctor if irritation or skin rash persists.
- **Eyes:** Flush with plenty of water for at least 15 minutes. Get medical attention immediately.
- **Ingestion:** If swallowed, contact a doctor or poison control centre immediately.

SECTION 9 - PREVENTIVE MEASURES

- **Spill, leak or release:** If a large quantity of dust is spilled, remove by vacuuming or wet-sweeping to prevent dust becoming airborne. Clean-up personnel should wear approved respirators.
- **Waste disposal:** Scrap metal may be reclaimed for later use. Dispose of in accordance with federal, provincial and local regulations.

PROTECTIVE EQUIPMENT

- **Respiratory protection:** Wear a NIOSH-approved cartridge respirator for particulates or a supplied air mask if dust and/or fumes equal or exceed TLV's.
- **Engineering controls:** Use sufficient local and/or general exhaust to keep fumes below exposure limits.
- **Protective gloves:** Wear gloves to protect against thermal burns and excessive skin contact.
- **Eye protection:** Use safety glasses with side shields or safety goggles to prevent injury to eyes when machining or in presence of high dust concentrations.
- **Other protective equipment:** Keep work areas clean and free of metallic dust.

STORAGE AND HANDLING

- **Handling procedures and equipment:** Avoid inhaling dusts or fumes. Dust should be placed in containers and kept sealed when not in use.
- **Storage requirements:** Store in a cool, dry area.
- **Special shipping information:** None (See Section 10).

SECTION 10 - REGULATION INFORMATION
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(Not meant to be all-inclusive - selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown on this page. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, provincial or state, and local laws. The following specific information is made for the purpose of complying with numerous federal, provincial or state, and local laws and requirements. See MSDS for health and safety information.

Canadian Regulations:

WHMIS INFORMATION: Not regulated as a Controlled Product.

TDG INFORMATION: Not regulated as dangerous goods.

U.S. Regulations:

SARA 313 INFORMATION: This product contains copper, which is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment Reauthorization Act of 1986 and 40 CFR Part 372.

Department of Transportation (DOT): The solid is not hazardous according to DOT criteria.

Additional notes or references:

Abbreviations:

ACGIH: American Conference of Governmental Industrial Hygienists
gpg: Guinea pig
IARC: International Agency for Research on Cancer
N/Ap Not applicable
N/Av: Not available
NIOSH: National Institute for Occupational Safety and Health

References:

1. Van Nostrand Reinhold, Dangerous Properties of Industrial Materials, Seventh Edition, N. Irving Sax.
2. Canadian Centre for Occupational Health and Safety. RTECS (Registry of Toxic Effects) and CHEMINFO databases.
3. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2000.
4. International Agency for Research on Cancer Monographs.