990061

MATERIAL SAFETY DATA SHEET

COPPER ALLOYS C19010, C19015

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SECTION # 1 - MATERIAL IDENTIFICATION

COPPER ALLOYS C19010 (PMC-102), C19015 (PMC-102M)
CHEMICAL FAMILY: COPPER ALLOY

SECTION # 2 - CHEMICAL COMPONENTS

NOTE: This MSDS applies to a range of alloys. For actual compositions refer to material test report or specific alloy specification. All percentages are by weight.

COMPONENT: COPPER
CAS NUMBER: 7440-50-8 **PERCENT OF MIXTURE:** 99.93 (maximum)

EXPOSURE LIMITS:

DUST, MIST:	ACGIH TLV-TWA	1 mg/M^3
	OSHA PEL-TWA	1 mg/M^3
FUME:	ACGIH TLV-TWA	0.2 mg/M^3
	OSHA PEL-TWA	0.1 mg/M^3

COMPONENT: MAGNESIUM
CAS NUMBER: 7439-95-4 **PERCENT OF MIXTURE:** 0.2 (maximum)

EXPOSURE LIMITS:

MAGNESIUM OXIDE FUME	ACGIH TLV-TWA	10 mg/M^3
	OSHA PEL-TWA	15 mg/M^3—total particulate

COMPONENT: NICKEL
CAS NUMBER: 7440-02-0 **PERCENT OF MIXTURE:** 3.0 (maximum)

EXPOSURE LIMITS:

ELEMENTAL/METAL	ACGIH TLV-TWA	1.5 mg/M^3
	OSHA PEL-TWA	1 mg/M^3

SECTION #2 - CHEMICAL COMPONENTS (continued)

COMPONENT: PHOSPHORUS
CAS NUMBER: 7723-14-0 **PERCENT OF MIXTURE:** 0.16 (maximum)
EXPOSURE LIMITS:

ACGIH TLV-TWA	0.1 mg/M^3
OSHA PEL-TWA	0.1 mg/M^3

COMPONENT: SILICON
CAS NUMBER: 7440-21-3 **PERCENT OF MIXTURE:** 1.0 (maximum)
EXPOSURE LIMITS:

ACGIH TLV-TWA	10 mg/M^3
OSHA PEL-TWA	5 mg/M^3—respirable fraction
	15 mg/M^3—total dust

SECTION # 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Copper alloy products in the natural state do not present a hazard for emergency response personnel.

POTENTIAL HEALTH EFFECTS:

Copper alloy products in the natural state do not present an inhalation, ingestion, or contact hazard. However, operations such as burning, welding, sawing, brazing, or grinding may release fumes and/or dusts which may present health hazards if TLVs are exceeded.

INHALATION:

- Short-term exposure to fumes/dust may produce irritation of the respiratory system.
- High concentrations of oxide fumes of copper or magnesium may cause metal fume fever.

EYE:

- Short-term exposure to fumes/dust may produce irritation.

SKIN:

- Repeated or prolonged exposure to copper dusts or mists may cause irritant or allergic contact dermatitis.

INGESTION:

- Ingestion of large doses of nickel compounds (1-3 mg/kg) has been shown to cause intestinal disorders, convulsions, and asphyxia.

SECTION #3 - HAZARDS IDENTIFICATION (continued)

CHRONIC EFFECTS:

- Repeated or prolonged overexposure to copper fume may cause the skin and hair to change color.
- Hypersensitivity to nickel is common and can cause allergic contact dermatitis, pulmonary asthma, and conjunctivitis.
- Chronic overexposure to phosphorus fumes may cause osteomyelitis of the jaw bones ("phossy" jaw).

SIGNS AND SYMPTOMS:

- Metal fume fever – metallic taste in mouth, dryness and irritation of the throat, and influenza-like symptoms. The effects may be delayed.
- Nickel overexposure – effects on nasal sinuses, including inflammation and ulceration.

CARCINOGENICITY:

COMPONENT	ACGIH	IARC	NTP
Copper (fume, dusts & mists)	No	No	No
Magnesium oxide fume	No	No	No
Nickel (elemental/metal)	No	Yes	Yes
Phosphorus (white or yellow)	No	No	No
Silicon	No	No	No

See Toxicological Information (Section #11)

SECTION # 4 - FIRST AID MEASURES

INHALATION:

If exposed to excessive levels of metal fumes, remove to fresh air. Seek medical attention.

EYES:

Flush with water for at least 15 minutes.

SKIN:

Wash with soap and water.

SECTION # 5 - FIRE FIGHTING MEASURES

FLASH POINT: Not applicable
AUTOIGNITION TEMPERATURE: Not applicable
LOWER EXPLOSIVE LIMIT (%): None
UPPER EXPLOSIVE LIMIT (%) None

EXTINGUISHING MEDIA:
Use extinguishing media appropriate to the surrounding material.

SPECIAL FIREFIGHTING INSTRUCTIONS:
Copper alloy products in the solid state present no fire or explosion hazard, but may react with strong acids, bases, or oxidizing agents.

SECTION # 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN THE EVENT OF SPILLS, LEAKS, OR RELEASES:
Not applicable

SECTION # 7 - HANDLING AND STORAGE

HANDLING:
In welding, precautions should also be taken for airborne contaminants that may originate from components of the welding rod.

SECTION # 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

VENTILATION:
Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding, or machining when exposure exceeds TLVs.

EYE PROTECTION:
Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by welding standards.

RESPIRATORY PROTECTION:
NIOSH/MSHA – Approved dust and fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLVs.

OTHER PREVENTIVE MEASURES:
Do not eat, drink, or smoke during work. Wash hands before eating or smoking.

SECTION # 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Salmon-colored, lustrous metal

ODOR:	None	**PHYSICAL STATE:**	Solid
pH:	Not applicable	**VAPOR PRESSURE:**	Not applicable
VAPOR DENSITY (AIR = 1)	Not applicable	**PERCENT VOLATILE:**	Not applicable
EVAPORATION RATE:	Not applicable	**SPECIFIC GRAVITY:**	8.9
SOLUBILITY IN WATER:	Not applicable	**MELTING POINT:**	1944 – 1994 °F

SECTION # 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY:
Stable

CONDITIONS TO AVOID:
None

INCOMPATIBILITY WITH OTHER MATERIALS:
Mercury, ammonia, acetylene acids
Contact with strong acids, bases, or oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS:
Metallic dust or fumes may be produced during welding, burning, grinding, and machining.

HAZARDOUS POLYMERIZATION:
Will not occur

SECTION # 11 - TOXICOLOGICAL INFORMATION

LETHAL DOSE OR CONCENTRATION OF PRODUCT OR ITS COMPONENTS:
LD50 = Lethal Dose 50
LDLo = Lowest Published Lethal Dose
TCLo/TDLo = Lowest Published Toxic Concentration/Dose

Copper	TDLo:	120 μg/kg (human, oral—gastrointestinal effects)
Nickel	LDLo:	5 g/kg (rat, oral)
Phosphorus	LDLo:	22 mg/kg (woman, oral—cardiac effects)
	TDLo:	11 mg/kg (woman, oral—gastrointestinal effects)
	LD50	3,030 μg/kg (rat, oral)
	LD50	4,820 μg/kg (mouse, oral)

SECTION # 12 - ECOLOGICAL INFORMATION

Not applicable

SECTION # 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS:
According to local, state, and federal regulations

SECTION # 14 - TRANSPORT INFORMATION

Not applicable

SECTION # 15 - REGULATORY INFORMATION

LISTED ON TSCA INVENTORY: YES

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): These alloys are not regulated under Section 302 of SARA and 40 CFR 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR 370): These alloys are defined as hazardous by OSHA under 29 CFR 1910.1200(d).

SARA TITLE III SECTION 313 TOXIC CHEMICALS (40 CFR 372): These alloys may contain the following toxic chemical(s) subject to reporting requirements under this section of SARA and of 40 CFR 372:

CAS NUMBER	CHEMICAL NAME	PERCENT BY WEIGHT OF ALLOY
7440-50-8	Copper	≤ 99.93
7439-02-0	Nickel	≤ 3.0

SECTION #15 – REGULATORY INFORMATION (continued)

OTHER LISTS:

Chemical Name	WHMIS Ingredient Disclosure List	CA Prop 65 Chemical	MA Toxic Substance List	MI Critical Materials Register	NJ Hazardous Substances List	PA Right-to-Know List
Copper	Yes	Yes	Yes	Yes	Yes	Yes
Magnesium	No	No	Yes	No	No	No
Nickel	Yes	Yes	Yes	Yes	Yes	Yes
Phosphorus	Yes	No	Yes	No	Yes	No
Silicon	No	No	Yes	No	No	No

SECTION # 16 - OTHER INFORMATION

REFERENCES

ACGIH Threshold Limit Values (1998)
International Agency for Research on Cancer (IARC) Monographs
National Library of Medicine Databases:
- ChemID
- Registry of Toxic Effects of Chemical Substances (RTECS) (updated August 6, 1998)
- Integrated Risk Information (IRIS) (updated August 6, 1998)
- Chemical Carcinogenesis Risk Information System (CCRIS) (updated August 6, 1998)
- Hazardous Substances Data Bank (HSDB) (updated August 6, 1998)

National Toxicology Program (NTP) Reports
NIOSH Pocket Guide to Chemical Hazards (1997)
NIOSH/OSHA Occupational Health Guideline for Copper Fume
NIOSH/OSHA Occupational Health Guideline for Copper Dusts and Mists
NIOSH/OSHA Occupational Health Guideline for Magnesium Oxide Fume
NIOSH/OSHA Occupational Health Guideline for Nickel Metal and Soluble Nickel Compounds
NIOSH/OSHA Occupational Health Guideline for Phosphorus (Yellow)
OSHA General Industry Standards (29 CFR 1910)

SECTION #16 – OTHER INFORMATION (continued)

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