



HEALTH	1
FLAMMABILITY	0
REACTIVITY	0
PROTECTIVE EQUIPMENT	

Nickel Plated Oxygen Free Copper Wire

NFPA RATING

HMIS RATING

SECTION I. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nickel Plated Oxygen Free Copper Wire; Single, Flat, & Multiple Stand Construction

Manufacturer/Vendor Information: **IWG High Performance Conductors**

1570 Campton Road
Inman, SC 29349

Phone: (864) 472-9022

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24-Hour Emergency Phone: (800) 424-9300 Chemtrec

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the Substance

GHS-US classification



- H302 - Harmful if swallowed
- H333 – May be harmful if inhaled
- H372 – Causes damage to organs through prolonged or repeated exposure
- H400 – Very toxic to aquatic life
- H412 – Harmful to aquatic life with long lasting effects

2.2 Unclassified Hazards

2.2.1 This material is stable under most conditions and presents minimal risk in the solid form as shipped, but thermal decomposition can create toxic vapors, gases, or fumes.

2.2.2 Abrasion, grinding, cutting, melting, welding, or other operations which reduce the particle size of the material will change the hazard classification of the product.

2.2.3 Reduction of the product into a dust or fume can create an explosion hazard if the dust or fume becomes airborne in the presence of a spark or ignition source.

2.2.4 This material as a dust or fume poses a health hazard when inhaled and / or ingested.

2.3 Unknown Acute Toxicity

No data available on inhalation acute toxicity. CDC (ASTDR) has established a minimal risk level for ingested copper at 0.01 mg/kg/day for acute oral exposure (1-14 days).

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>CAS No.</u>	<u>Chemical Name</u>	<u>% by wt.</u>
7440-50-8	Copper	>70.00
7440-02-0	Nickel	<30.00
7440-48-4	Cobalt	<0.045

SECTION 4. FIRST AID**4.1 Instructions**

4.1.1 Eyes: If dust or fume contacts the eyes, flush with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

4.1.2 Skin: Wash with soap and water. Get medical attention if irritation develops or persists. Contact with nickel may cause "nickel itch" a sensitization reaction causing itching, burning, erythema and eczema.

4.1.3 Ingestion: Rinse mouth. If conscious, induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

4.1.4 Inhalation: Nickel metal is a pulmonary sensitizer. If exposed to excessive levels of dusts or fumes, move to fresh air and get medical attention if cough or other symptoms develop. If not breathing administer CPR.

4.2 Signs and Symptoms

Irritation of eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis.

ACUTE "Metal Fume Fever" Symptoms include: irritation of eyes, nose, throat, and skin; flu-like symptoms – sudden or delayed onset of chills, weakness, fatigue, nausea, vomiting, headache, diarrhea, muscular pains; tightness of chest; paralysis; loss of consciousness or death.

4.3 Note to Physician

Wilson's Disease or G6PD deficiency causes individuals to absorb, retain, and store copper excessively, leading to copper toxicosis. Nickel is a known allergen.

SECTION 5. FIRE FIGHTING MEASURES

5.1 Fire Fighting / Extinguishing Media: Particulate copper nickel fire utilize: powdered dolomite, sodium chloride, or graphite.

5.2 Fire Fighting Procedures:

(1.) Evacuate area and fight fire from a safe distance. As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear. Avoid direct water stream on molten material. Molten form explodes upon contact with water.

(2.) Particulate copper powder is a moderate fire hazard. For copper fires do not use water; apply powdered dolomite, sodium chloride, or graphite. Material as shipped does not support combustion. Use fire extinguishing media appropriate for surrounding material.

5.3 Fire and Explosion Hazards: Heavy airborne concentrations of fine powder in enclosed spaces may ignite or explode in the presence of an ignition source.

5.4 Unusual Hazards: Toxic gases and vapors may be released in a fire. In the presence of halogens, copper powder may become explosive with heat, percussion, or light friction. In the presence of wet acetylene and ammonia, copper forms explosive acetylides.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Use clean up measures that avoid dust generation (mist with water, wet vacuum). Wear a NIOSH/MSHA approved respirator if dust will be generated in clean-up. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to environment.

SECTION 7. HANDLING AND STORAGE**7.1 Handling Information**

Not hazardous with intended use and / or in stable solid state.

7.2 Storage Information

Do not store near strong acids, bases or oxidizing agents or incompatible materials as described in Section 10.

7.3 Other Precaution

Minimize dust/fume generation and accumulation. Provide good ventilation in process area to prevent formation of vapor. Avoid inhalation of dust or fume. Wash hands and exposed skin with mild soap and clean water after handling. Wash excess dust from skin.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**8.1 Exposure Limits:**

Copper: ACGIH TWA: 1 mg/m³ (dusts & mists), ACGIH TWA: 0.2 mg/m³ (fume), OSHA PEL TWA: 1 mg/m³ (dust), OSHA PEL TWA: 0.1 mg/m³ (fume).

Nickel: ACGIH TWA: 0.5 mg/m³ (metal), OSHA PEL TWA: 1mg/m³

8.2 Engineering Controls

If user operations generate dust or fume, use ventilation to keep exposure to airborne contaminants below the exposure limits.

8.3 PPE

8.3.1 Eye Protection: If user operations generate dust or fume use safety glasses with side-shields or goggles.

8.3.2 Skin Protection: Use protective clothing to prevent repeated or prolonged skin contact. Wash hands and exposed areas with mild soap and water.

8.3.3 Respiratory Protection: A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use. For concentrations up to 10 times the exposure limit, use NIOSH or MSHA approved half- or full-face, air-purifying respirator. For higher concentrations, consult a professional industrial hygienist.

SECTION 9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Silver, lustrous, malleable solid. / Metal in various forms (wire, flat wire).

Odor: No odor.

Melting Point: Copper substrate: 1981° F, Nickel coating: 2651° F

Boiling Point: Copper substrate: 4703° F, Nickel coating: 5275° F

Specific Gravity: Density: > 8.90 (Water =1)

Vapor Pressure: 1 mmHg @ 1628° C / 20 mmHg @ 1970° C

Solubility in Water: Insoluble at T=20° C / pressure = 1 bar

**Data regarding the heat of vaporization, vapor density, odor threshold, pH, freezing point, flash point, evaporation rate, relative density, flammability limits (upper/lower), flammability (solid, gas), partition coefficient: n-octanol/water, auto ignition temperature, decomposition temperature, and viscosity, is not available at this time.

SECTION 10. STABILITY AND REACTIVITY**10.1 Reactivity**

No additional information available.

10.2 Chemical Stability

Noncombustible solid in bulk form, but powdered form may ignite.

10.3 Possibility of Hazardous Reactions

Not established.

10.4 Conditions to Avoid

Direct sunlight. Extremely high or low temperatures.

10.5 Incompatible Materials

Potentially explosive with acetylinic compounds (C₂H₂), 3-bromopropene (BrO₃⁻), ethylene oxide (C₂H₄O), lead azide (Pb(N₃)₂), fused ammonium nitrate (NH₄NO₃), nitrosyl fluoride (FNO) and iodine pentafluoride (IF₅). Ignites on contact with chlorine (Cl), fluorine (F₂), and hydrazine mononitrate (H₅N₃O₃). Reacts violently with sodium azide (NaN₃), halogenates, peroxides - hydrogen peroxide (H₂O₂) & sodium peroxide (Na₂O₂), hydrogen sulfide (H₂S), hydrazoic acid (HN₃), bromates (BrO₃⁻), chlorates (ClO₃⁻), iodates (NaIO₃), chloride (Cl⁻), hypochlorites (ClO⁻), potassium oxide (K₂O), potassium hydroxide (KOH), copper nitrate (Cu(NO₃)₂), sulfur (S); strong acids, strong bases, oxidizers. Adding peroxyformic acid to powdered nickel will result in explosion. Powdered nickel reacts explosively upon contact with fused ammonium nitrate at temperatures below 200° C.

10.6 Hazardous Decomposition Products

Toxic metal fumes. Copper oxide. Nickel oxide.

SECTION 11. TOXICOLOGICAL INFO**11.1 Route(s) of Exposure**

Inhalation, eye, and ingestion of dust or fume.

11.2 Effects of Overexposure

Mild to moderate exposure: Ingestion or inhalation may cause irritation of the respiratory tract, moderate stomach irritation, and skin dysfunction including discoloration. Dust or fume may cause eye irritation. Dust may cause skin irritation.

Chronic Exposure: Skin sensitization; neurological damage; respiratory disease; and kidney dysfunction.

Acute Exposure: "Metal Fume Fever" due to overexposure to welding gases or lack of oxygen, characterized by metallic taste in mouth.

Target Organs: Eyes, skin (allergen), respiratory system, liver, kidneys (increased risk with Wilson's disease).

Medical Conditions Aggravated by Exposure: Wilson's disease

11.3 Signs and Symptoms

Irritation of eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis.

ACUTE "Metal Fume Fever" Symptoms include: irritation of eyes, nose, throat, and skin; flu-like symptoms – sudden or delayed onset of chills, weakness, fatigue, nausea, vomiting, headache, diarrhea, muscular pains; tightness of chest; paralysis; loss of consciousness or death.

SECTION 11. TOXICOLOGICAL INFO (Con't)**11.4 Carcinogenicity**

Copper: NTP: No IARC: No OSHA: No
Nickel: NTP: 2 IARC: 2 OSHA: Yes

11.5 Toxicology TestsCopper (7440-50-8)

Test : 1

LD/LC: LD₅₀

Test Type: Acute

Test Route: Intraperitoneal

Test Species: Mouse

Results Amounts: 3.5 mg/kg

Inhalation Toxicity: Scientific evidence does not indicate that exposure to copper dust or fume causes upper respiratory irritation in a manner that is different than that following high dose exposure to other non-specific irritants.

Reproduction: Female rate 22 weeks prior to mating, oral route, dose 1520 ug/kg – specific developmental abnormalities (musculoskeletal system). At 152 mg/kg effects included stunted fetus and central nervous system. Female rats 35 weeks prior to mating, oral route, 1210 ug/kg – effects on fertility (pre- and post-implantation mortality) (RTECS).

Additional Information: There are no human data and inadequate animal data (HSDB) for carcinogenicity.

Nickel 7440-02-0

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: LD50: Not available. LC50: Not available.

Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP. Causes damage to the following organs: skin. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans: Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.

Special Remarks on Toxicity to Animals: Lowest Published Lethal Dose/Conc: LDL [Rat] - Route: Oral; Dose: 5000 mg/kg LDL [Guinea Pig] - Route: Oral; Dose: 5000 mg/kg

Special Remarks on Chronic Effects on Humans: May cause cancer based on animal test data

SECTION 12. ECOLOGICAL INFO***12.1 Toxicity**

Copper (7440-50-8)	
LC50 fishes 1	0.0068 - 0.0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 other aquatic organisms 1	0.0426 - 0.0535 mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
LC50 fish 2	< 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 other aquatic organisms 2	0.031 - 0.054 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])

*Adapted from Freeport-McMoran Cadmium Copper C16200 SDS

Nickel 7440-02-0

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

SECTION 13. DISPOSAL CONSIDERATIONS**13.1 Waste Disposal Method**

Recycle metal to a metal recovery agent. Waste should be disposed in accordance with Federal, State, and Local environmental control regulations. Avoid release to the environment.

SECTION 14. TRANSPORT INFORMATION**14.1 USDOT**

Not regulated in solid form.

SECTION 15. REGULATORY INFORMATION**15.1 US FEDERAL - REGULATIONS**

Federal Drinking Water Standards: Copper: EPA 1300 ug/l

CERCLA: Copper: RQ 5000 lbs; no reporting is required if diameter of the pieces of solid material is \geq 100 mm (0.04 inches) for copper.

RCRA: Copper: Not listed.

Clean Water Act: Copper: Designated as a toxic pollutant and is subject to effluent limitations.

SARA Title III – Emission Reporting: Copper is reportable per Section 313. Depending on quantity of wire processed, **copper** may be individually reportable under TRI.

TSCA: Copper: Listed.

CERCLA Hazardous Substances: No reporting of releases of the solid form is required if the mean diameter of the pieces of the solid metal released is greater than 100 micrometers (0.004 inches).

Clean Air Act: Copper: Not on HAPs list.

Federal and State Regulations: Nickel:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel metal
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel metal
Connecticut hazardous material survey.: Nickel metal
Illinois toxic substances disclosure to employee act: Nickel metal
Illinois chemical safety act: Nickel metal
New York release reporting list: Nickel metal
Rhode Island RTK hazardous substances: Nickel metal
Pennsylvania RTK: Nickel metal
Michigan critical material: Nickel metal
Massachusetts RTK: Nickel metal
Massachusetts spill list: Nickel metal
New Jersey: Nickel metal
New Jersey spill list: Nickel metal
Louisiana spill reporting: Nickel metal
California Director's List of Hazardous Substances: Nickel metal
TSCA 8(b) inventory: Nickel metal

Other Regulations: Nickel:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

15.2 CANADA – REGULATIONS

Canadian Domestic Substance List: Copper: Listed. **Nickel:** Listed.

WHMIS Classification: Copper: Uncontrolled. **Nickel:** Class D-2A: Material causing other toxic effects (VERY TOXIC)

15.3 EU – REGULATIONS

EINECS (European Inventory of Existing Commercial Chemical Substances): Copper: Listed. **Nickel:** Listed.

SECTION 16. OTHER INFORMATION

Prepared By: Environmental, Health, & Safety Department
IWG-High Performance Conductors, Inc.

Disclaimer: This information is based on available scientific evidence known to IWG High Performance Conductors, Inc. It is provided solely for compliance to the Hazard Communication Standard. This information is furnished without warranty, expressed or implicit; and is subject to change.