

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Copper (II) Oxide, Enriched Copper (II) Oxide
Chemical Formula	CuO
Molecular Weight	79.545
CAS No.	1317-38-0
Supplier Address*	ISO FLEX USA PO Box 29475 San Francisco CA 94129 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (both supplier and manufacturer)	Infotrac/ +1 800-535-5053 *May include subsidiaries or affiliate companies/divisions
Email	iusa@isoflex.com
Website	www.isoflex.com
Preparation Information	ISO FLEX USA Product Safety +1 415-440-4433

2. HAZARDOUS INGREDIENTS

Emergency Overview

<i>OSHA Hazards</i>	Toxic by ingestion
<i>GHS Classification</i>	Acute toxicity, Oral (Category 4) Acute aquatic toxicity (Category 1) Chronic aquatic toxicity (Category 1)
<i>Hazard Statement(s)</i>	H302 Harmful if swallowed H410 Very toxic to aquatic life with long-lasting effects
<i>Precautionary statement(s)</i>	P273 Avoid release to the environment P501 Dispose of contents/ container to an approved waste disposal plant

NFPA Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 2 Flammability = 0 Reactivity = 0



HMIS Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 2 Flammability = 0 Physical Hazard = 0

HEALTH HAZARD	2
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	

Potential Health Effects

<i>Inhalation</i>	May be harmful if inhaled; may cause respiratory tract irritation
<i>Skin</i>	May be harmful if absorbed through skin; may cause skin irritation
<i>Eyes</i>	May cause eye irritation
<i>Ingestion</i>	Toxic if swallowed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name:	Copper (II) Oxide
CAS No.:	1317-38-0
Molecular Weight:	79.545
Chemical Formula:	CuO

4. FIRST AID MEASURES

<i>Inhalation</i>	Remove person to fresh air, keep warm and quiet, give oxygen if breathing is difficult, and seek medical attention if symptoms persist.
<i>Ingestion</i>	Give 1-2 glasses of milk or water and induce vomiting; seek immediate medical attention. Never induce vomiting or give anything by mouth to an unconscious person.
<i>Skin</i>	Remove any contaminated clothing, brush material off skin, flush with running water, and wash carefully with soap and water. Seek medical attention if symptoms persist.
<i>Eyes</i>	Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

5. FIREFIGHTING MEASURES

<i>Flash Point</i>	N/E or N/A
<i>Autoignition Temperature</i>	N/A
<i>Flammable Limits</i>	
<i>Lower</i>	N/A
<i>Upper</i>	N/A
<i>Extinguishing Media</i>	Use suitable extinguishing media for surrounding material and type of fire.
<i>Special Fire Fighting Procedures</i>	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 dichloromethylsilane, hydrogen sulfide or hydrogen trisulfide. May react violently with hydrazine, PN₂H, titanium or zirconium. May have a violent exothermic reaction with boron when heated. May explode when heated with powdered aluminum, anilinium perchlorate, hydrogen or phthalic anhydride. May explode at 350 °C with cesium acetylene carbide.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods for Cleaning Up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling

Avoid contact with skin and eyes. Avoid formation of dust or aerosols. Provide appropriate exhaust ventilation at places where dust is formed. 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 or smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

Storage

Store in cool, dry, well-ventilated area. Keep tightly sealed when not in use.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protective Equipment

Respiratory Protection

For nuisance exposures, use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher-level protection, use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand Protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye Protection

Use safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN166 (EU).

Skin and Body Protection

Use complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practices. Wash hands before breaks and at the end of the workday.

9. PHYSICAL PROPERTIES

Appearance

<i>Form</i>	Powder or Granules
<i>Color</i>	Black
<i>Odor</i>	None

Safety Data

<i>Boiling Point</i>	2000 °C
<i>Melting Point</i>	1326 °C
<i>Specific Gravity</i>	6.4 g/cc
<i>Vapor Pressure</i>	N/A
<i>Solubility in H₂O</i>	Insoluble
<i>% Volatile</i>	N/E or N/A

10. STABILITY AND REACTIVITY

<i>Stability</i>	Stable
<i>Conditions to Avoid</i>	None
<i>Materials to Avoid</i>	Cesium acetylene carbide, hydrazine, PN ₂ H, titanium, zirconium, chloromethylsilane, hydrogen sulfide, hydrogen trisulfide, powdered aluminum, aniline perchlorate, hydrogen magnesium, phthalic anhydride or boron.
<i>Hazardous Decomposition Products</i>	None
<i>Hazardous Polymerization</i>	Will not occur

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral LD50 Rat – 470 mg/kg

Effects of Exposure To the best of our knowledge the chemical, physical and toxicological properties of copper oxide have not been thoroughly investigated and reported. In animals, inhalation of copper dust has caused hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, and a condition closely resembling hemochromatosis bronzed diabetes. (Sax, *Dangerous Properties of Industrial Materials*, eighth edition)

Acute Effects

<i>Inhalation</i>	Metallic taste, irritation of upper respiratory tract, congestion of the nasal mucous membranes
<i>Ingestion</i>	Moderately toxic by ingestion; may cause acute copper toxicity
<i>Skin</i>	May cause irritation
<i>Eye</i>	May cause irritation to the conjunctiva

Chronic Effects

<i>Inhalation</i>	May cause ulceration and perforation of the nasal septum, and/or pharyngeal congestion
<i>Ingestion</i>	May cause irritation to the gastrointestinal tract, and/or chronic copper toxicity. May cause damage to the nervous system or kidneys. May enlarge the liver.

<i>Skin</i>	May cause dermatitis
<i>Eye</i>	No chronic health effects recorded
<i>Routes of Entry</i>	Inhalation, skin, eyes, ingestion
<i>Target Organs</i>	May affect the respiratory system, skin, liver, central nervous system or kidneys
<i>Medical Conditions Generally Aggravated by Exposure</i>	Pre-existing respiratory, gastric disorders and an increased risk for individuals with Wilson's disease.
Carcinogenicity	
<i>NTP</i>	No
<i>IARC</i>	No
<i>OSHA</i>	No

12. ECOLOGICAL INFORMATION

Toxicity

<i>Toxicity to Fish</i>	LC50 - <i>Oncorhynchus mykiss</i> (rainbow trout) - 25.4 mg/l - 96 h
<i>Toxicity to Daphnia and Other Aquatic Invertebrates</i>	EC50 - <i>Daphnia magna</i> (water flea) - 0.011 - 0.039 mg/l - 48 h
<i>Persistence and Degradability</i>	Methods for determining the biological degradability are not applicable to inorganic substances.
<i>Bioaccumulative Potential</i>	No data available
<i>Mobility in Soil</i>	No data available
<i>PBT and vPvB Assessment</i>	No data available
<i>Other Adverse Effects</i>	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life, with long-lasting effects.

13. DISPOSAL CONSIDERATIONS

<i>Product</i>	Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.
<i>Contaminated Packaging</i>	Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)	N/A - not listed as dangerous goods
IMDG	
<i>UN number</i>	3077
<i>Class</i>	9
<i>Packing Group</i>	III
<i>EMS No.</i>	F-A, S-F
<i>Proper Shipping Name</i>	Environmentally Hazardous Substance, Solid, N.O.S. (Copper oxide)
<i>Marine Pollutant</i>	Marine pollutant

IATA

<i>UN number</i>	3077
<i>Class</i>	9
<i>Packing Group</i>	III
<i>Proper Shipping Name</i>	Environmentally hazardous substance, Solid, N.O.S. (Copper oxide)

Further Information	EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packaging
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15. REGULATORY INFORMATION

OSHA Hazards	Toxic by ingestion
SARA 302	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components	The following components are subject to reporting levels established by SARA Title III, Section 313: Copper Oxide, CAS No. 1317-38-0, Revision Date 2007-07-01.
SARA 311/312 Hazards	Acute Health Hazard
Massachusetts Right to Know Components	No components are subject to the Massachusetts Right to Know Act
Pennsylvania Right to Know Components	Copper Oxide, CAS No. 1317-38-0, Revision Date 2007-07-01
New Jersey Right to Know Components	Copper Oxide, CAS No. 1317-38-0, Revision Date 2007-07-01
California Prop. 65 Components	This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

<i>Prepared By</i>	ISOFLEX USA PO Box 29475 San Francisco CA 94129 United States
<i>Issuing Date</i>	January 23, 2015
<i>Revision Date</i>	August 01, 2021
<i>Revision Number</i>	3
<i>Revision Note</i>	Required review and update

ISOFLEX USA's Commonly Used Abbreviations and Acronyms*

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
CAM	Continuous Air Monitor
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CEN	European Committee for Standardization
CERCLA	Comprehensive Environmental Response Compensation and Liability Act

CLP	Classification, Labelling and Packaging (European Union)
CPR	Controlled Products Regulations (Canada)
CWA	Clean Water Act (USA)
DAC	Derived Air Concentration (USA)
DOE	United States Department of Energy (USA)
DOT	United States Department of Transportation (USA)
DSL	Domestic Substances List (Canada)
EC50	Half Maximal Effective Concentration
EINECS	European Inventory of Existing Commercial Chemical Substances
EHS	Environmentally Hazardous Substance
ELINCS	European List of Notified Chemical Substances
EMS	Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA	Environmental Protection Agency (USA)
EPCRA	Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986
GHS	Globally Harmonized System
HMIS	Hazardous Materials Identification System (USA)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Containers
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life or Health
IMDG	International Maritime Code for Dangerous Goods
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
LDLO	Lethal Dose Low
LOEC	Lowest-Observed-Effective Concentration
MARPOL	International Convention for the Prevention of Pollution from Ships
MSHA	Mine Safety and Health Administration (USA)
NCRP	National Council on Radiation Protection & Measurements (USA)
NDSL	Non-Domestic Substances List (Canada)
NFPA	National Fire Protection Association (USA)
NIOSH	National Institute for Occupational Safety and Health (USA)
NOEC	No Observed Effect Concentration
N.O.S.	Not Otherwise Specified
NRC	Nuclear Regulatory Commission (USA)
NTP	National Toxicology Program (USA)
OSHA	Occupational Safety and Health Administration (USA)
PBT	Persistent Bioaccumulative and Toxic Chemical
PEL	Permissible Exposure Limit
PIH	Poisonous by Inhalation Hazard
RCRA	Resource Conservation and Recovery Act (USA)
RCT	Radiation Control Technician
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)
RID	Regulations Concerning the International Transport of Dangerous Goods by Rail
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
TDG	Transportation of Dangerous Goods (Canada)
TIH	Toxic by Inhalation Hazard
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UN	United Nations (Number)
VOC	Volatile Organic Compound
vPvB	Very Persistent Very Bioaccumulative Chemical
WGK	Wassergefährungsklassen (Germany: Water Hazard Classes)
WHMIS	Workplace Hazardous Materials Information System

*One or more of the above-listed items may not appear in this document.

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