SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: PENETROX™ E OXIDE INHIBITING COMPOUND
Product Description: Oxide inhibiting compound with evenly distributed copper particles.
Intended Use: Copper to copper connections, copper threads, grounding applications.

COMPANY IDENTIFICATION

Supplier: **BURNDY LLC**
47 East Industrial Park Drive
Manchester, NH 03109 USA

24 Hour Emergency (800) 535-5053 *(US and Canada)*
(352) 323-3500 *(International)*
Burndy Informational Number (603) 647-5000

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION

Health	Environmental	Physical
•Skin Irritation - Category 2 •Eye Irritation - Category 2B	•Acute toxicity - Category 1 •Chronic toxicity - Category 1	•No classifiable hazards

LABELLING

Symbols:


Irritant


Environmental Hazard

Signal Word: Warning

Hazard Statements	*Precautionary Statements*
•H 315: Causes skin irritation •H 320: Causes eye irritation •H 410: Very toxic to aquatic life with long lasting effects	•P 264: Wash thoroughly after handling •P 273: Avoid release to the environment •P 280: Wear protective gloves/clothing

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	Common Name/Synonym	CAS#	Percentage	Impurities
Copper	Copper metal dusts, Copper Bronze	7440-50-8	15%	None Known
Urethane Polymer of Castor Oil	Cosmetol; Ricinus Oil	8001-79-4	Not Specified	None Known

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.
** The product may contain additional non-hazardous or trade secret components.

SECTION 4 FIRST AID MEASURES

ROUTES OF ENTRY: Ingestion, Contact

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Not likely to be hazardous by inhalation under normal conditions although chemical fumes can be generated during heating or combustion of product. Copper fumes can cause metal fume fever. If exposed to excessive levels of fumes or dust may cause respiratory tract irritation, remove to fresh air. Get medical attention if cough or other symptoms develop.

Eye Contact: Direct contact with product can cause eye irritation. Irrigate eyes with low pressure water for at least 15 minutes, including under the eyelids. If irritation, swelling, or redness persists seek medical attention.

Skin Contact: Product may be irritating to the skin. For skin contact wipe product off of skin, wash area thoroughly with soap and water. Remove contaminated shoes or clothing if necessary. Get medical help if irritation continues.

Ingestion: May cause gastric distress, stomach pains, vomiting, and diarrhea. Do not induce vomiting. Contact poison control and seek medical help. Never give anything by mouth to an unconscious victim.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: CO_2, foam, dry chemical, or water spray/fog

Inappropriate Extinguishing Media: Not Applicable

FIRE FIGHTING

Fire Fighting Instructions: Firefighters should use standard protective equipment and including a self-contained breathing apparatus (SCBA).

Unusual Fire Hazards/Combustible Products: Closed containers may explode. Fire produces dense black smoke. Product is combustible when exposed to heat. Product may release carbon monoxide and other hazardous gases when burned. Fires involving copper can produce noxious compounds.

SECTION 6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for firefighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewer, basements or confined areas. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations may

require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

CLEAN UP AND CONTAINMENT METHODS

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not touch or walk through spilled material. Avoid direct contact and wear specific protective equipment specified in section 8. Absorb or cover with dry earth, sand or other non-combustible material and vacuum or sweep to transfer material to containers. Prevent entry into waterways, sewer, basements or confined areas.

Water Spill: Confine the spill immediately with booms. Stop leak if you can do it without risk. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

SECTION 7 HANDLING AND STORAGE

Handling Procedures and Equipment

Avoid direct contact with heat and ignition sources. Avoid prolonged skin contact, contact with eyes, and ingestion. It is recommended that product is used in well ventilated areas. Wash hands before eating, drinking, and/or smoking. Empty containers may contain residue. Product residue may be combustible, but will not readily burn. Read product label for additional information.

Storage Requirements

Store in a cool well-ventilated area with the lid tightly sealed when not in use. Keep away from children.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Component Name	CAS #	TWA/STEL	OSHA	ACGIH	Note
Copper	7440-50-8	TWA	1.0 mg/m^3	1.0 mg/m^3	N/A
Urethane Polymer of Castor Oil	8001-79-4	TWA	5 mg/m^3 (mist)	5 mg/m^3 (mist)	See Note Below

Note:
*Exposure limits for urethane polymer of castor oil have not been established. The limits presented above are recommended limits based on a similar material, mineral oil.

ENGINEERING CONTROLS

General and/or local exhaust ventilation is recommended to maintain air quality and keep airborne exposures below recommended occupational exposure limits. Eyewash stations and washing facilities should be located in close proximity to work operations in which this product is used.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: Respiratory protection is not expected to be required under normal usage of this material. A NIOSH approved respirator is recommended in situations where airborne contaminant concentration has not been confirmed to be below safe levels.

Skin Protection: No protection is ordinarily required under normal conditions of use. If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves. In instances where splashing or soaking is expected, wear oil or chemical resistant clothing.

Eye Protection: Under normal expected conditions, safety glasses with side shields are appropriate. In instances where contact is more likely to occur, chemical goggles or a full face shield is recommended.

Skin and Body Protection: No protection is ordinarily required under normal conditions of use. If prolonged or repeated contact is likely, chemical and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL/CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Semi-solid grease
Color: Gray
Odor: Mild Odor
Odor Threshold: Not Applicable

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Flash Point [Method]: 260^{0}C (500^0 F) [ASTM D92]
Flammable Limits (Approximate volume % in air): Not Volatile - Not Applicable
Autoignition Temperature: >204^{0}C (>400^{0}F)
Flammability: Not Readily Flammable
Decomposition Temperature: Not Available
Boiling Point/Range: >315.5^{0}C (> 600^{0}F)
Melting/Freezing Point: Copper 1083^{0}C
Vapor Pressure: Copper: 1 mmHg (at 1627^{o}C); Urethane Polymer of Castor Oil: 86 mmHg

Vapor Density (Air = 1): >1
Solubility in Water: Insoluble

Specific Gravity (Water = 1): 1.07
% Volatile: Not Applicable

Evaporation Rate (n-butyl acetate = 1): Negligible
Viscosity: Not Available
Partition Coefficient (n-Octanol/Water): Not Available
pH: Not Applicable

Pour Point: Similar material (Mineral Oil): -60°C (-76°F)
Molecular Weight: Not Available
Molecular Formula: Mixture

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

CONDITIONS TO AVOID: Excessive heat, direct contact with flames, contact with incompatible materials, moisture.

MATERIALS TO AVOID: Oxidizing materials, acids, alkalis, chlorates, and bromates.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating or combustion produces oxides of acrid smoke, toxic vapors and gases, carbon and copper compounds.

POSSIBILITY OF HAZARDOUS REACTIONS: None are known.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY VALUES

Ingredient	LD_{50}/LC_{50} Route and Species	Conclusion / Remarks
Copper	LD_{50}: 3.5 mg/kg, Mouse Intraperitoneal >5000 mg/kg, Rat Oral	Patty's Industrial Hygiene and toxicology (1981), American Journal of Pathology.
Urethane Polymer of Castor Oil	LD_{50}: >5000 mg/kg, Rat Oral	No further data reported.

ACUTE EFFECTS

Eye Contact: Direct contact with product can cause eye irritation.

Skin Contact: Prolonged contact may cause skin irritation, folliculitis, oil acne, and dermatitis.

Inhalation: Breathing vapors, mists, or fumes may cause irritation to respiratory tract, especially if product has been heated. Inhalation of copper fumes may cause metal fume fever.

Ingestion: May cause gastric distress, stomach pains, vomiting, and diarrhea.

Target Organ Effects: Skin Dermatitis, Irritation

Medical Conditions Aggravated by Exposure: Pre-existing skin, eye or respiratory disorders may become aggravated through prolonged exposure.

CHRONIC/OTHER EFFECTS

Acute copper poisoning after ingestion can cause liver injury, methemoglobinemia, and hemolytic anemia. Acute renal failure may result, secondary to massive hemoglobinuria. Inhalation of fumes can cause metal fume fever, characterized by fever, chills, malaise, headache, cough, and abdominal discomfort.

Effects typically last for 24-48 hours usually without long term reported effects. Copper is not listed by IARC or ACGIH as a carcinogen. Urethane polymer of castor oil is not suspected to be a

human carcinogen. Additional information may be available by request.

Carcinogenicity: IARC: NO ACGIH: NO NTP: NO OSHA Regulated: NO

The following ingredients are cited on the lists below: None

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Ingredient	LC_{50} and Species	Conclusion / Remarks
Copper	5.08 ug/L / 96 hr., *Pimphales promelas* (Fathead Minnow) 125 ug/L / 96 hr., *Salmo ocellatus* (Atlantic Salmon)	Very highly toxic to species.
Urethane Polymer of Castor Oil	>10000 mg/L / 96 hr., *Danio rerio* (Zebra fish)	Freshwater, semi-static

Environmental Fate

Mobility in soil is affected by the pH, but copper is not significantly mobile. Although copper is commonly found in natural environments and plants at low levels contamination can be very highly toxic to aquatic species. Limited data suggests there is low potential for bioaccumulation in aquatic environments. Oil releases may cause long term environmental effects, however urethane polymer of castor oil is not suspected of being toxic to the environment. Industrial products should not be discharged to sewers or other water sources to prevent the risks of long term adverse effects and environmental contamination.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable Local, State and Federal laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

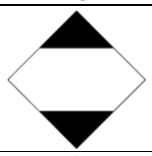
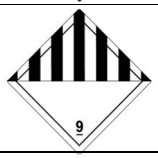
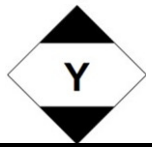
Copper is regulated under the Clean Water Act. Do not discharge into sewers or waterways. May be landfilled at an approved facility. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

REGULATORY DISPOSAL INFORMATION

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure

complete and accurate classification.
RCRA P-List: None listed
RCRA U-List: None listed

SECTION 14 TRANSPORTATION

Regulatory Information	UN Number	Proper Shipping Name	Hazard Class	Packing Group	Label(s)	RQ	Additional Information
US DOT	UN3077	Environmentally hazardous substance, solid, n.o.s. (Copper, Zinc)	9	III		5,000 Lbs	Only regulated for transportation as a hazardous substance
TDG	UN3077	Environmentally hazardous substance, solid, n.o.s. (Copper, Zinc)	9	III			
							May be offered as a Limited Quantity (See TDG Schedule 1)
ADR	UN3077	Environmentally hazardous substance, solid, n.o.s. (Copper, Zinc)	9	III			
							May be offered as a Limited Quantity (See ADR Table A)
IATA	UN3077	Environmentally hazardous substance, solid, n.o.s. (Copper, Zinc)	9	III			
							May be offered as a Limited Quantity (See IATA PI Y911)

IMDG	UN3077	Environmentally hazardous substance, solid, n.o.s. (Copper, Zinc)	9	III			Copper metal powder is a severe marine pollutant

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Delayed health

SARA (313) TOXIC RELEASE INVENTORY: No

CALIFORNIA PROP 65: This product contains no chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

CLEAN WATER ACT/OIL POLLUTION ACT: This product contains mineral oil, copper and zinc which are subject to regulation by Section 311 of the Clean Water Act and the Oil Pollution Act. Releases of product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802

INTERNATIONAL REGULATIONS:

WHMIS CLASSIFICATION

Class D2B: Skin/Eye Irritant

WHMIS HAZARD SYMBOLS

EUROPEAN INVENTORY OF EXISTING CHEMICALS (EINECS):

Chemical Name	CAS Number	EINECS Number
Copper	7440-50-8	7440-50-8
Urethane Polymer of Castor Oil	8001-79-4	232-293-8

EU RISK (R) AND SAFETY (S) PHRASES:

R 36/38: Irritating to the eyes and skin.
R 52/53: Toxic to aquatic organisms, may cause long term harmful effects.
S16: Keep away from sources of ignition.

S 24/25: Avoid contact with skin and eyes.
S 36/37: Wear suitable gloves and eye/face protection.
S 61: Avoid release to the environment

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
Copper	7440-50-8	1,4
Urethane Polymer of Castor Oil	8001-79-4	

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health - 1 Flammability - 1 Reactivity - 0

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS) RATINGS:

Health - 1 Flammability - 1 Physical Hazard - 0 PPE - B

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Date	Description	Sections Affected
6/2/11	MSDS Version written	1-11
7/21/11	Updated to GHS criteria, additional sections added.	1-16
8/1/11	Updates	15
11/08/2012	Updates	1, 3, 8, 9, 11, 12, 15
3/21/2013	Updates	11
4/22/2013	Version number update	-

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