

**MATERIAL SAFETY DATA SHEET**

AMERICAN MINERALS

MSDS ID: AM057  
Product No. GR30CU  
Date Prepared: 12/97

Phone: AMERICAN MINERALS: 610-962-5050  
CHEMTRAC, 24-Hr Emergency Assistance: 1-800-424-9300

**SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Material/Product Names: GRANUSOL® 30% CU  
CAS Number: Mineral Mixture  
Chemical family: Inorganic Oxide  
Description: Granusol 30% CU is a succrate (carboxylate) of copper plus other micronutrients; a granulated micronutrient formulated to contain 30% copper.

Manufacturer/Supplier: American Minerals  
901 East Eighth Ave.  
Suite 200  
King of Prussia, PA 19406 Phone: 610/962-5050

**SECTION 2. INGREDIENTS/COMPOSITION**

Ingredient name:	CAS Number:	Percent:	IARC/NTP/OSHA:	Exposure Limits:
Copper Compounds as /Cu/:	7440-50-8	30	No	Copper Dust & Compounds as /Cu/ ACGIH TWA: 1 mg/m <sup>3</sup> ; OSHA Cu fume: 0.10 mg/m <sup>3</sup> ; OSHA PEL:TWA: 1 mg/m <sup>3</sup> .
Misc. Nonhazardous Ingredients	-----	70	No	Nuisance Particulate Not Otherwise Regulated OSHA PEL:TWA 15mg/m <sup>3</sup> ; respirable dust: 5mg/m <sup>3</sup> . ACGIH TLV:TWA Total dust: 10mg/m <sup>3</sup> ; respirable dust: 5mg/m <sup>3</sup> .
Quartz (SiO <sub>2</sub> )	14808-60-7	< 1	Yes	ACGIH TLV:TWA respirable quartz: 0.10mg/m <sup>3</sup> .

Quartz, a polymorph of crystalline silica, is classified by IARC as "Known Human Carcinogen - Group 1". NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

The product contains traces of lead (<500 ppm), arsenic (<20 ppm), cadmium (<30 ppm), mercury (<2 ppm), nickel (<100 ppm), and 0.04% zinc.

Exposure limits listed for each of the ingredients is for exposure to dust that may be generated during product transfer and handling.

Please Note! GRANUSOL® 30% COPPER is formulated for use as a micronutrient and the health effects addressed in this MSDS are those health effects relating from use of this product for its intended purpose.

**SECTION 3. HAZARDS IDENTIFICATION**

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HEALTH HAZARD	2 - MODERATE HAZARD
FLAMMABILITY HAZARD	0 - MINIMAL HAZARD
REACTIVITY HAZARD	0 - MINIMAL HAZARD
PERSONAL PROTECTION	E - Eye Protection, Gloves & Respirator

**EMERGENCY OVERVIEW:**

Dry, dense black, free-flowing, granules of 100 mesh size.  
Avoid dust inhalation. Prevent spills from entering water or drain systems.  
Not a fire hazard.

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HAZARD IDENTIFICATION continues on page 2

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**HAZARD IDENTIFICATION continued from page 1**

Primary route(s) of entry: Inhalation  
Target Organs: Eyes, skin, respiratory tract.

**Acute effects:**

Inhalation of dusts and mists is very irritating to the eyes and respiratory tract. Ulceration and perforation of the nasal septum and sloughing and ulceration of the respiratory tract is possible.

**Chronic Effects:**

Dermatitis may result from repeated skin exposure. Persons affected by Wilson's disease may develop hemolytic anemia secondary to copper accumulation in liver. The product may contain a trace of crystalline silica (<1%) which has been classified by IARC as a "known human carcinogen - Group 1". NTP has listed respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

**Signs & symptoms of overexposure:**

**Eye contact:** Particulate is irritating and can cause conjunctivitis or even ulceration and turbidity of the cornea.

**Skin contact:** Excessive contact can be irritating and cause itching eczema and vesicular lesions.

**Inhalation:** Excessive inhalation of dust is very irritating to the nasal septum and upper respiratory tract.

**Ingestion:** An unlikely route of exposure. If ingested in large amounts, gastrointestinal irritation will occur with salivation, nausea and vomiting, gastric pain, diarrhea, and possible hemorrhagic gastritis. Because of its irritating and astringent nature, copper (II) oxide will usually produce vomiting, but if it doesn't occur or is delayed, then absorption through the stomach and systemic toxicity may occur. Symptoms include widespread capillary damage, kidney and liver injury, and central nervous system excitation followed by depression. Circulatory shock and intravascular hemolysis may lead to tubular kidney injury and death due to kidney failure.

**SECTION 4. FIRST AID MEASURES**

**Eye contact:** Flush eyes, including under the eyelids, with large amounts of water. If irritation persists, seek medical attention.

**Skin contact:** Wash affected areas with mild soap and water.

**Inhalation:** Remove victim to fresh air. If not breathing, give artificial respiration. Get immediate medical attention.

**Ingestion:** Ingestion is an unlikely route of exposure. Never give anything by mouth to an unconscious person. If spontaneous vomiting does not occur, gastric lavage is recommended. Contact poison control center. Seek immediate medical attention.

**SECTION 5. FIRE FIGHTING MEASURES**

NFPA code: Flammability: 0, Health: 0, Reactivity: 0, Special: 0.

Flash point: Not Combustible

Unusual Fire Hazard/ Extinguishing Media: None

Hazardous Decomposition Products: Exposure to fire/high temperature will produce a caramel odor and possibly some CO and CO<sub>2</sub> and possibly some copper fume.

Firefighting instructions: Firefighters should wear NIOSH-approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Spill procedures:** Dike spills to prevent release into sewers and waterways. Carefully, cleanup and place spilled material into a suitable container, being careful to avoid creating excessive dusty conditions. If conditions warrant, clean-up personnel should wear approved respiratory protection, gloves, and goggles to prevent irritation from contact and/or inhalation. Because copper is expensive investigate recycling rather than disposal.

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SECTION 7. HANDLING AND STORAGE

Storage: Store bags in cool, dry, well-ventilated area away from incompatible materials (Section 10).

Handling: Minimize dust generation during material handling and transfer.  
Minimize inhalation of dust.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Provide sufficient ventilation, in both volume and air flow patterns, to control dust concentrations below allowable exposure limits.

Personal protective equipment: The use of eye protection, gloves and long sleeve clothing is recommended.

Respiration protection: For dust concentrations above allowable nuisance particulate limit provide employees with NIOSH/MSHA approved particulate dust respirator in accordance with requirements of 29 CFR 1910.134.

Hygienic Practices: Avoid contact with skin, eyes and clothing. After handling this product, wash hands before eating or drinking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: A dry, black, mixture of 100 mesh granules odorless.

Boiling Point: Not Applicable

Melting Point: >2800°F (>1530°C)

Water Solubility: Slight

pH (10% aqueous slurry): 6-8

Specific Gravity (g/cc): Mixture

Bulk Weight (lbs/cu.ft): 120-140

% Volatile by volume: 0

Evaporation rate: Not Applicable

SECTION 10. STABILITY AND REACTIVITY

Stability: The product is stable at room temperature in closed containers under normal storage and handling conditions.

Hazardous Polymerization: Will not occur.

Chemical Incompatibilities: The copper oxide in the mix can react with powdered aluminum, boron, cesium acetylene carbide, hydrazine, magnesium, phospham, potassium, sodium, titanium, zirconium, rubidium acetylene carbide, barium acetate, yttrium oxide, hydrogen sulfide, anilinium perchlorate, hydrogen, phthalic anhydride, hydroxylamine, dichloromethylsilane, sodium hypobromite solution. It forms explosive acetylides with acetylene in caustic solutions

SECTION 11. TOXICOLOGICAL INFORMATION

Copper (II): Toxicity Data: poison by intratracheal route.

Acute Effects: Rat, intratracheal, LD<sub>50</sub>: 278 mg/kg

Quartz CAS# 14808-60-7. Toxic and Hazard Review (Sax): Experimental poison by intratracheal and intravenous routes. An experimental carcinogen, tumorigen, and neoplastigen. Human systemic effects by inhalation: cough, dyspnea, liver effects. Listed by IARC as a "Known Human Carcinogen - Group 1". Listed by NTP. No LD<sub>50</sub> in RTECS. Inhalation human: TCLo 16 million particles per cubic centimeter per 8 hours per 17.9 Years-Intermittent: Pulmonary system effects; Inhalation-human LCLo: 300 micrograms/m<sup>3</sup> per 10 years-intermittent; liver. Other species toxicity data (NIOSH RTECS): intravenous-rat LDLo: 90 mg/kg; intraperitoneal-rat LDLo: 200 mg/kg; intravenous-mouse LDLo: 40 mg/kg; intravenous-dog LDLo: 20 mg/kg.

Balance of Ingredients: No LD<sub>50</sub> or LC<sub>50</sub> found for oral, dermal, or inhalation routes of administration.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicological/Chemical Fate Information:

Copper (II) will precipitate out copper in alkaline waters. Acidic waters promote solubility and may affect microorganisms and aquatic life depending of copper concentration.

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SECTION 13. DISPOSAL INFORMATION

Waste Management/Disposal: This product does not exhibit any characteristics of a hazardous waste, and is suitable for landfill disposal. However, because of the value of copper, recycling should be investigated before consideration of landfill disposal. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state and local regulations.

SECTION 14. TRANSPORT INFORMATION

US Department of Transportation: Not regulated by DOT as a hazardous material. No hazard class, no label or placard required, no UN or NA number assigned.  
Canadian TDG Hazard Class & PIN: Not regulated

SECTION 15. REGULATORY INFORMATION

Product or components of mixture regulated under following lists:

SARA TITLE III:

- Section 302: No (Extremely Hazardous Substances)
- Section 304: No (Emergency Release)
- Section 311: Yes, Toxic, MSDS
- Section 312: Yes, Inventory & Location, (Tier I/II)
- Section 313: Yes (Toxic Chemicals, Toxic Chemical Release Reporting, Form R).  
Copper is a 313 listed substance and subject to reporting requirements of Section 313. Product contains 30% copper.

CERCLA Hazardous Substance List: Listed (as copper compounds) as a CERCLA Hazardous Substance (40 CFR 302.4) per CWA, Sec. 307(a).

CERCLA Reportable Quantity: RQ: Not listed for the broad class

TSCA: Yes. All substances contained in this product are listed in TSCA inventory.

SECTION 16. OTHER INFORMATION

ACRONYMS AND REFERENCES USED IN PREPARATION OF MSDS:

ACGIH:	American Conference of Governmental Industrial Hygienists
CAS#:	CAS Registration Number is an assigned number to identify a material. CAS stands for Chemical Abstracts Service.
CERCLA:	Comprehensive Environmental Response, Compensation & Liability Act
EPCRA:	Emergency Planning and Community Right-to-Know Act of 1986
HMIS:	Hazardous Materials Identification System (National Paint & Coatings Association)
IARC:	International Agency for Research on Cancer
MSHA:	Mine Safety and Health Administration
mg/m <sup>3</sup> :	Milligrams per cubic meter
NIOSH:	National Institute for Occupational Safety and Health
NFPA:	National Fire Protection Association
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit (OSHA)
SARA:	Superfund Amendments and Reauthorization Act
TITLE III:	Emergency Planning and Community Right To Know Act
Section 302:	Extremely Hazardous Substances
Section 304:	Emergency Release
Section 311:	Community Right-to-Know, MSDSs or List of Chemicals
Section 312:	Community Right-to-Know, Inventories & Locations, (Tier I/Tier II)
Section 313:	Toxic Chemicals, Toxic Chemical Release Reporting, Form R
TLV:	Threshold Limit Values (ACGIH)
TWA:	Time Weighted Average
29CFR1910.134:	OSHA Respiratory Protection Standard

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Clansky, K.S., Suspect Chemicals Sourcebook, 1992-2 Edition, Roytech Publications, Bethesda, Maryland.  
Sax, N. Irving and Lewis, R.J. Hawley's Condensed Chemical Dictionary, Eleventh Ed., Van Nostrand Reinhold Co., Inc., NY  
Manufacturers/Suppliers, Material Safety Data Sheets on Raw Materials Used  
American National Standard for Hazardous Industrial Chemicals - Material Safety Data Sheets - Preparation, American National Standards Institute, Inc. 11 West 42nd St, New York, NY 10036.

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