13600
CUPRICOXIDE

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>MIN/MAX</th>
<th>TYPICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cupric Oxide - CuO (13600 method)</td>
<td>98% MIN</td>
<td>98.5%</td>
</tr>
<tr>
<td>Total Copper</td>
<td>78.5% MIN</td>
<td>79.5%</td>
</tr>
<tr>
<td>Cuprous Oxide</td>
<td>3% MAX</td>
<td>2.49%</td>
</tr>
<tr>
<td>Metallic Copper</td>
<td>1.5% MAX</td>
<td>.75%</td>
</tr>
<tr>
<td>Metal Other Than Copper</td>
<td>.3%</td>
<td>NIL</td>
</tr>
<tr>
<td>Acetone Soluble</td>
<td>NIL</td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>NIL</td>
<td></td>
</tr>
<tr>
<td>Sulfates</td>
<td>NIL</td>
<td></td>
</tr>
<tr>
<td>Moisture Content</td>
<td>NIL</td>
<td></td>
</tr>
</tbody>
</table>

PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>-325 Mesh (Tyler)</td>
<td>99.9%</td>
</tr>
<tr>
<td>Oil Demand per 100 pounds pigment</td>
<td>10.9 lbs.</td>
</tr>
<tr>
<td>Specific Gravity (g/cc)</td>
<td>6.9716</td>
</tr>
<tr>
<td>Pounds per U.S. Gallon</td>
<td>58.07</td>
</tr>
<tr>
<td>Bulking - U.S. Gallons per Pound</td>
<td>.01722</td>
</tr>
<tr>
<td>Bulking - Cubic Centimeters per Gram</td>
<td>.14343</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>91.23</td>
</tr>
</tbody>
</table>

C.A.S. Number 1317-38-0

Available packaged in 50 lb. paper bags, bulk bags or steel pails.
Also available in other sizes upon request.

This material meets the requirements of U.S. Military Specification MILC13600A

July 1990
MATERIAL SAFETY DATA SHEET
13600 SERIES CUPRIC OXIDE

SECTION I
MANUFACTURER
AMERICAN CHEMEX CORPORATION
P.O. Box 1160
East Helena, MT 59635

EMERGENCY TELEPHONE
(406) 227-1302  ATTN: Dan Brimhall

SECTION II
CHEMICAL NAME FORMULA CAS NUMBER APPROX. WT. %
CUPROUS OXIDE Cu2O 1317-39-1 1.5
CUPRIC OXIDE CuO 1317-38-0 98
METALLIC COPPER Cu 7440-50-8 0.5

Hazardous Ingredients
COPPER
- TLV & PEL: 78% (Min) 1 mg/m³
- There is no ACGIH TLV or OSHA PEL for either cuprous oxide or cupric oxide. Exposure is governed by the 8 hour TWA established for finely divided copper as dusts or mists. Cuprous oxide, cupric oxide and copper are not carcinogenic materials as listed by OSHA (29CFR1910) or ACGIH (Appendix A, Threshold Limit Values for Chemical Substances 1989-1990).

PHYSICAL DATA

SectioN III
Boiling Point (°F) Specific Gravity: Vapor Pressure:
H₂O = 1 NA
Vapor Density: Evaporation Rate:
NA NA
Solubility in Water: Negligible
Melting Point: Cupric oxide decomposes at 1847°F to cuprous oxide and oxygen. Cuprous oxide melts at 1225°F
Appearance and Odor: Black finely divided powder. No odor.

SECTION IV
Flammable Limits
LEL UEL

FIRE & EXPLOSION HAZARD DATA

SECTION V
Health Hazard Data
Threshold Limit Value: See Section II

Signs, Symptoms, and Effects of Overexposure: Nausea, chills, diarrhea. May cause respiratory irritation; skin irritation (oxide pox); fever, eye irritation with redness, pain and conjunctivitis; preexisting lung diseases may be aggravated by exposure. Could result in respiratory disease if over exposed on a chronic basis.

Primary Routes of Entry: Inhalation and/or ingestion.

Emergency and First Aid Procedure: Remove to fresh air. Lay patient down. Cover with blanket. If irritated, flush eyes and skin with large volumes of fresh water for 15 minutes. Refer to physician.

SECTION VI

REACTION DATA

Stable X Unstable

Conditions and Materials to Avoid: Cupric oxide may react violently with strong reductants, e.g., organic compounds, such as but not limited to hydrazine and arolyne carbide compounds, acids, bases, and metals such as but not limited to Al, Mg, B, K, Cu, Ti, & Zr.

Hazardous Decomposition Products: Copper fumes will be released if cuprous oxide is heated above its melting point (2255°).

Hazardous Polymerization: Will not occur.

SECTION VII

SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled. Clean up with vacuum or conventional tools. Avoid dusting.

SECTION VIII

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Cartridge type filter or dust mask approved by MSHA or NIOSH. Refer to Respiratory Protective Devices approved by Bureau of Mines Circular IC 8346.

Ventilation: To keep below listed TLV in Section II, use general dilution type ventilation.

Protective Gloves: Wear if skin contact is probable and skin is sensitive.

Eye Protection: Safety glasses or goggles.

Other Protective Equipment: Long sleeve shirts if contact is probable and skin is sensitive.

SECTION IX

SPECIAL PRECAUTIONS

Precautions to be taken in handling and storing: Keep lids tightly sealed. Store in cool, dry place.

SECTION X

SARA TITLE III

This product contains copper compounds and is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.