# Technical Data Sheet

## $Cu_2O$ Nanoparticles

## Description

Copper (I) Oxide nanoparticles are reddish-brown nanocrystalline powders with unique optical, electrical, and antimicrobial properties. At the nanoscale, $Cu_2O$ exhibits enhanced catalytic activity, narrow bandgap semiconducting behavior, and strong antimicrobial performance. These features make $Cu_2O$-NPs highly suitable for use in catalysis, sensors, energy devices, coatings, and biomedical applications.

## Properties

- Appearance: Reddish-brown fine powder
- Average Particle Size: 20-90 nm
- Purity: >99%
- Density: 6.0 g/cm³
- Morphology: Spherical
- Crystal Structure: Cubic
- Band Gap Energy: 2.0–2.2 eV
- Packaging: 1kg / 5kg / 25kg

## Applications

- Catalysis: Photocatalytic degradation of pollutants, CO oxidation, hydrogen production
- Electronics & Sensors: Gas sensors, solar cells, lithium-ion battery anodes
- Coatings & Polymers: Antimicrobial additive, UV protection, coloration
- Biomedical: Antibacterial and antifungal agents, wound care (research use)
- Energy & Environmental: Wastewater treatment, photocatalytic water splitting

## Features

- Narrow bandgap semiconductor (p-type) for electronics & solar devices
- High catalytic and photocatalytic activity
- Strong antimicrobial and antifungal performance
- Good stability under controlled conditions
- Reddish color useful as pigment in coatings and plastics
- Enhances functional performance in polymer composites and coatings

## Notes

- The product should be stored in the original container securely under cool and dry conditions away from direct sunlight, heat and contamination.
- Shelf life at proper storage is about 24 months from the production date, but it is recommended to consume the product within 12 months.