

Technical Data Sheet

Fe₃O₄ Nanoparticles



Description

Magnetite nanoparticles are black, magnetic nanocrystalline powders with unique superparamagnetic and conductive properties. At the nanoscale, Fe₃O₄ exhibits high surface activity, strong magnetism, and biocompatibility, making it suitable for catalysis, energy storage, sensors, environmental remediation, and biomedical applications such as targeted drug delivery and magnetic resonance imaging (MRI).

Properties

- Appearance: Black fine powder
- Average Particle Size: 10-70 nm
- Purity: >99%
- Density: 5.2 g/cm³
- Morphology: Spherical
- Crystal Structure: Inverse Spinel (Cubic)
- Band Gap Energy: 0.1 eV
- Packaging: 1kg / 5kg / 25kg



Applications

- Biomedical: MRI contrast agents, targeted drug delivery, hyperthermia therapy (research use)
- Environmental: Magnetic separation of pollutants, wastewater treatment
- Catalysis: Photocatalysis, Fenton-like reactions, pollutant degradation
- Energy & Electronics: Lithium-ion battery anodes, supercapacitors, magnetic sensors
- Coatings & Polymers: Functional filler for conductivity and magnetic properties

Features

- Strong superparamagnetic behavior at nanoscale
- High surface area and reactivity
- Narrow bandgap semiconductor with catalytic activity
- Biocompatible for certain medical research uses
- Stable dispersions possible with surface modification (hydrophilic/hydrophobic)
- Enables functional enhancement in composites, coatings, and polymers

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.

