

TECHNICAL DATA SHEET

High-Purity Single-Walled Carbon Nanotube Powders

Product code: CTI series (CTI5000 · CTI2000 · CTI600 · CTIH · CTIC · CTIN · CTIPP)

Revision 2026-09

Description

Industrially produced single-walled carbon nanotube (SWCNT) powders combining high purity, low defect density and very large aspect ratio (1–2 nm diameter, >100 μm length). Manufactured at kiloton-scale capacity with tight batch-to-batch consistency, the CTI series is the base material for conductive additives in lithium-ion, sodium-ion and solid-state batteries, ESD/antistatic polymers, coatings, EMI shielding and structural composites. Three pristine grades are offered by residual iron content; hydroxyl-, carboxyl- and amine-functionalized grades are available for aqueous and reactive systems, and a >90% grade is offered for plastics and rubber compounding.

Specifications

Grade	Code	Outer dia. (nm)	Purity (wt%)	Length (μm)	SSA (m^2/g)	IG/ID (Raman 532 nm)	Iron (ppm)
High Purity SWCNT	CTI5000	1–2	99.5 ± 0.5	>100	>800	>60	<5000
High Purity SWCNT	CTI2000	1–2	99.5 ± 0.5	>100	>800	>60	<2000
Super High Purity SWCNT	CTI600	1–2	99.5 ± 0.5	>100	>800	>60	<600
Hydroxylated SWCNT	CTIH	1–2	>98	>100	>800	N/A	N/A
Carboxylated SWCNT	CTIC	1–2	>98	>100	>800	N/A	N/A
Aminated SWCNT	CTIN	1–2	>98	>100	>800	N/A	N/A
SWCNT for Plastics & Rubber	CTIPP	1–2	>90	>100	>300	N/A	N/A

Purity by TGA. Iron by ICP. SSA by BET. Characterization images (SEM, TEM) and Raman spectra supplied with each lot.

Grade Selection

- CTI600 (<600 ppm Fe): high-nickel NMC/NCA cathodes, solid-state composite electrodes, and any cell design sensitive to transition-metal dissolution.
- CTI2000: silicon and silicon-graphite anodes, sodium-ion electrodes, LFP cathodes, primer coatings for current collectors.
- CTI5000: general conductive additive, EMI shielding, cement and structural composites, thermal management.
- CTIH / CTIC / CTIN: water-borne dispersions, epoxy and polyurethane systems, covalent coupling to polymer matrices, 3D-printing inks.
- CTIPP: masterbatches and direct compounding in thermoplastics and rubber where 90% purity is sufficient.

Key Application Data (Representative Data)

- Silicon anode: 2 wt% SWCNT in pure silicon, coin half-cell at 0.5C: >92% capacity retention after 100 cycles, Coulombic efficiency ~99.95%.
- Cathode (NMC, LFP): 0.1–0.5 wt% SWCNT builds a percolating conductive network, improving rate capability and cycle life versus carbon black / MWCNT.

- Dry-process electrodes: dry-blends with active material and PTFE binder, self-assembling into a 3D conductive network during fibrillation and calendaring.
- Polymers: percolation at 0.05–0.2 wt% net SWCNT; permanent antistatic without carbon sloughing; enables colored and transparent ESD parts.

Handling

- Black, low-bulk-density powder. Store sealed, dry, at room temperature. Disperse by high-shear mixing, bead milling or probe sonication in NMP, water (with dispersant) or resin carriers. Use local exhaust and respiratory protection when handling dry powder; see SDS.

Ordering, Packaging & Documentation

- Available from evaluation quantities through multi-ton annual supply agreements; ISO 9001 certified production.
- Each lot ships with a representative Certificate of Analysis; Raman, TGA, SEM/TEM data available on request.

All values are representative of typical production and do not constitute a lot-specific guarantee. Certificates of analysis accompany each shipment.

- Safety Data Sheet available at cheaptubes.com/nanomaterial-msds-safety-sheets.

Values are typical unless stated as limits. Application results depend on formulation, equipment and process conditions; confirm with your own trials. Cheap Tubes Inc. makes no warranty of fitness for a particular purpose beyond the published specification.

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