



## 1. Identification

### Product Identifier

Carbon Nanotubes >1mm in length (CAS#: 308068-56-6)

**Note:** The closest CAS number for our formulation is CAS#: 308068-56-6, but our carbon nanotubes are different, primarily in their length, in ways that make them more suitable for certain applications and potentially safer to work with since they are too long to be inhaled.

### Manufacturer

**Company:** Industrial CNT LLC (Troll Hair)

**Description:** Industrial CNT LLC (Troll Hair) manufactures carbon nanotubes in Nevada and ships anywhere in the United States and internationally.

**Main Contact:** Lee Nolan

**Phone:** (917) 601-9449

**Email:** [lee@trollhair.com](mailto:lee@trollhair.com)

### Recommended Use

Industrial use, reinforcing agent, research and development, as a conductive additive.

### Emergency Contact

**Contact:** Dr. Bradley Edwards

**Phone number:** (206) 661-5008

## 2. Hazard(s) identification

**OSHA Hazards:** Irritant

### GHS Classification

- Eye irritation (Category 2A)
- Specific target organ toxicity - single exposure (Category 3)

**Label elements:**



**Signal Word:** Warning

### **Hazard Statements**

- H319: Causes serious eye irritation
- H335: May cause respiratory irritation

### **Precautionary Statements**

- P261: Avoid breathing dust.
- P280: Wear protective gloves/eye protection.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
- P337+P313: If eye irritation persists: Get medical advice/attention.
- P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P403+P233: Store in a well-ventilated place. Keep container tightly closed.
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

### **HMIS Classification**

- Health hazard: 2
- Flammability: 0
- Physical hazards: 0

### **NFPA Rating**

- Health hazard: 2
- Fire: 0
- Reactivity Hazard: 0

### **Potential Health Effects**

- Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
- Skin: May be harmful if absorbed through skin. May cause skin irritation.
- Eyes: May cause eye irritation.
- Ingestion: May be harmful if swallowed.

### 3. Composition/Information On Ingredients

**Composition:** Multi-walled carbon nanotubes (graphitic carbon) 94% - 100%

**Metal Impurities:** Balance

### 4. First-aid measures

**After inhalation:** Remove to fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

**After skin contact:** Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

**After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing:** Seek immediate medical advice.

#### **Most important symptoms/effects, acute and delayed**

- Eye exposure: May cause irritation, redness, tearing, and temporary discomfort
- Inhalation: May cause respiratory tract irritation and coughing
- Skin contact: May cause temporary irritation, redness, or dryness of the affected area
- Ingestion: May cause gastrointestinal irritation and discomfort

**Note:** The symptoms/effects of carbon nanotubes are not well studied or understood. These are potential symptoms based on general knowledge of similar materials. Precautions should be taken to prevent inhalation, contact with skin or eyes, or ingestion.

**Indication of immediate medical attention and special treatment needed:** No data available

### 5. Fire-fighting measures

**Suitable extinguishing media:** Use alcohol-resistant foam, dry chemical or carbon dioxide

**Specific hazards arising from the chemical:** Hazardous decomposition products formed under fire conditions (Carbon oxides).

**Hazardous combustion products:** Carbon oxides (CO and CO<sub>2</sub> gas).

**Special protective equipment:** Wear self-contained breathing apparatus for firefighting if necessary

**Further information:** Fire fighting methods for carbon nanotubes are not well studied.

**Note:** Due to the hydrophobic nature of carbon nanotubes, water may have limited effectiveness as an extinguishing agent but can be used to cool exposed containers.

## 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures:** Use personal protective equipment. Avoid dust formation. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**Environmental precautions:** Do not let product enter drains.

**Methods and materials for containment and cleaning up:** Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

## 7. Handling and storage

**Precautions for safe handling:** Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

**Conditions for safe storage, including any incompatibilities:** Keep container tightly closed in a dry and well-ventilated place.

## 8. Exposure controls/personal protection

**Occupational exposure limit values:** No data available (Specific Occupational Exposure Limits (OELs) for carbon nanotubes are still evolving and may exist from organizations like NIOSH or under specific regulations.)

**Appropriate engineering controls:** Provide appropriate exhaust ventilation at places where dust is formed.

### Individual protection measures (Personal protective equipment - PPE)

**Respiratory protection:** The EPA mandates the use of full face respirators with minimum N100 grade cartridges if there is any risk of exposure to carbon nanotube dust. For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection:** For any handling steps where the substance is in particulate form or in a suspension with pure water where the substance is not solubilized, the gloves must be

composed of material that successfully passes ASTM F-1671. For any handling steps where the substance is part of a carrier liquid, other than the aqueous suspension noted in the previous paragraph, gloves must be composed of material that successfully passes ASTM F-739 (continuous liquid contact method). Gloves must be changed before they show degradation and before the designated breakthrough time for the carrier liquid (as determined by the ASTM F-739 testing or by the manufacturer). Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching the glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

**Eye protection:** Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection:** Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

## 9. Physical and chemical properties

### Appearance

- Form: Solid, clumps up to several millimeters in the largest dimension.
- Color: Dark gray to black

**Odor:** Odorless

**Odor threshold:** Not applicable (odorless)

**pH:** Not applicable (insoluble in water)

**Melting point/freezing point:** Not applicable (decomposes before melting)

**Initial boiling point and boiling range:** Not applicable

**Flash point:** Not applicable (solid, requires very high temperatures for ignition)

**Evaporation rate:** Not applicable (solid)

**Flammability (solid, gas):** May burn at extremely high temperatures

**Upper/lower flammability or explosive limits:** Not applicable

**Vapor pressure:** Not applicable at normal conditions

**Vapor density:** Not applicable

**Relative density/Bulk density:** 1.7-2.1 g/cm<sup>3</sup> (typical for MWCNTs)

**Solubility:** Insoluble in water

**Partition coefficient (n-octanol/water):** Not applicable

**Auto-ignition temperature:** No data available

**Decomposition temperature:** >450°C in air (oxidation begins)

**Viscosity:** Not applicable (solid)

**Explosive properties:** Not explosive

**Oxidizing properties:** To be determined

**Specific properties**

- Nanotube length: greater than 1mm
- Nanotube diameter: 50 – 120 nm

## 10. Stability and reactivity

**Reactivity:** Generally low reactivity under normal conditions. May react with strong oxidizing agents.

**Chemical stability:** Stable under recommended storage conditions.

**Possibility of hazardous reactions:** May react with strong oxidizers. No hazardous polymerization.

**Conditions to avoid:** Extreme temperatures (above 450°C) and strong oxidizing environments.

**Incompatible materials:** May conflict with strong oxidizing agents, strong oxidizing acids, or strong bases.

**Hazardous decomposition products:** No data available

**Note:** The reactivity and decomposition properties of carbon nanotubes have not been thoroughly investigated. This information represents the best available knowledge at the time of preparation and should be treated with appropriate caution.

# 11. Toxicological information

## Acute toxicity

- Oral LD50: No data available
- Inhalation LC50: No data available
- Dermal LD50: No data available

**Other information on acute toxicity:** No data available

**Skin corrosion/irritation:** No data available

**Serious eye damage/eye irritation:** May cause eye irritation. Limited data available.

**Respiratory or skin sensitization:** May cause respiratory issues. Limited data available.

**Germ cell mutagenicity:** No data available

**Carcinogenicity:** Not classified — Carbon nanotubes, other than MWCNT-7 (Mitsui-7), are classified by IARC as Group 3 (not classifiable as to its carcinogenicity to humans).

**Reproductive toxicity:** No data available

**Specific target organ toxicity - single exposure (STOT-SE):** No data available

**Specific target organ toxicity - repeated exposure (STOT-RE):** No data available

**Aspiration hazard:** No data available

**Additional Information:** The chemical, physical, and toxicological properties of carbon nanotubes have not been thoroughly investigated.

# 12. Ecological information

**Ecotoxicity:** No specific data available for this product.

**Persistence and degradability:** Carbon nanotubes are expected to be persistent in the environment.

**Bioaccumulative potential:** No specific data available. Likely to accumulate due to physical properties.

**Mobility in soil:** Low mobility expected due to physical properties.

**Other adverse effects:** No specific data available. Prevent release to the environment as a precautionary measure.

## 13. Disposal considerations

**Waste disposal recommendations:** Dispose of contents/container in accordance with local/regional/national/international regulations. Consult an environmental professional for assistance with appropriate disposal methods.

**Contaminated packaging:** Empty containers should be taken to an approved waste handling site for recycling or disposal.

## 14. Transport information

**DOT (US):** Not dangerous goods

**IMDG:** Not dangerous goods

**IATA:** Not dangerous goods

## 15. Regulatory information

**OSHA Hazards:** Irritant

**SARA 302 Components:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components:** This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards:** No data available

**Inventory Status:** This material is listed on the US Toxic Substances Control Act (TSCA) Inventory and the following chemical inventories: Canadian Domestic Substances List (DSL), European Inventory of Existing Commercial Chemical Substances (EINECS), Korean Existing Chemicals List (ECL), Australian Inventory of Chemical Substances (AICS), the Philippines Inventory of Chemicals and Chemical Substances (PICCS), and the Swiss Giftlist 1 Inventory of Notified New Substances. In addition, this substance is not regulated in Japan and excluded from the Japanese Chemical Substances Control Law according to the Japanese Ministry of Economy, Trade and Industry, formerly the Ministry of International Trade and Industry (MITI).

**Massachusetts Right To Know Components:** No components are subject to the Massachusetts Right to Know Act.

**Proposition 65 (California):** Not listed

**PFAS:** Does not contain PFAS (per- and polyfluoroalkyl substances).



## 16. Other information

**Date of Preparation or Last Revision:** March 2025

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