



**NanoSolve® Dispersion in MEK**  
**Material Safety Data Sheet**

**Section I Product and Company Identification**

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<b>Product Name</b>	NanoSolve® Additive in MEK
<b>Chemical Name</b>	Carbon nanotube (fullerene) functionalized in Methyl Ethyl Ketone
<b>Issue Date</b>	October 1, 2009

**Section II Hazard Ingredients/Identity Information**

Substance	CAS Number	OSHA PEL	ACGIH TLV	Carcinogenicity Classification	Approx %
Carbon Nanotubes (Graphite)	7782-42-5	Total Dust: 15mg/m <sup>3</sup> Respirable Fraction: 5mg/m <sup>3</sup>	All Forms: 2mg/m <sup>3</sup>	Not Listed	< 10%
Proprietary ingredient	N/A	Not Available	Not Available	Not Listed	< 5%
Methyl Ethyl Ketone	78-93-3	Not Available	Not Available	Not Listed	> 90%

**Section III Physical/Chemical Characteristics**

<b>Boiling Point</b>	79 °C (175°F)
<b>Vapor Pressure (mm Hg)</b>	Not applicable.
<b>Vapor Density (AIR = 1)</b>	2.42
<b>Specific gravity</b>	0.806 (Water = 1)
<b>Melting/Freezing point</b>	-86°C (-123°F)

<b>Evaporation rate</b>	7.12
<b>Solubility in Water</b>	Water
<b>Appearance and Odor</b>	Black solution with minty odor.

#### Section IV Fire and Explosion Hazard Data

<b>Flash Point</b>	-9 °C (15°F)
<b>Explosion Limits</b>	Flammability Limits Lower: 1.4%, Upper: 11.4%
<b>Extinguishing Media</b>	May use water spray, dry chemical, or carbon dioxide, alcohol foam, or fog.
<b>Special Fire Fighting Procedures</b>	Fire procedures should include wearing a self-contained breathing apparatus (MSHA/NIOSH) and all fire equipment should be fully decontaminated after use. Vapor may travel considerable distance to source of ignition and flash.
<b>Decomposition Products</b>	Not determined
<b>Unusual Fire and Explosion Hazards</b>	Flammable and explosive in presence of shocks and static discharge.

#### Section V Stability and Reactivity

<b>Stability</b>	Stable at room temperature. Unknown.
<b>Incompatibility</b>	Highly reactive with oxidizing agents. Reactive with acids and alkalis.
<b>Decomposition</b>	Not determined
<b>Hazardous Polymerization</b>	Will not occur

#### Section VI Health Hazard Data

<b>Symptoms of Exposure:</b>	Hazardous in case of eye contact.
<b>Eye</b>	Carbon nanotubes were not toxic to rabbit eye in Draize test. Methyl Ethyl Ketone causes inflammation of the eye with redness, watering, and itching.
<b>Skin</b>	Studies on the effects of dermal contact with carbon nanotubes are limited. Carbon nanotubes did not cause enzyme induction, increased DNA synthesis, or hyperplasia in the skin. Methyl Ethyl Ketone is hazardous to skin and can cause itching, scaling, reddening, or, occasionally, blistering. Dermal Toxicity (LD50): 6480 mg/kg (Rabbit)
<b>Ingestion</b>	Hazardous in case of ingestion. Toxicity is (LD50): 2737 mg/kg (Rat)
<b>Inhalation</b>	Carbon nanotubes may cause pulmonary irritation, inflammation, granuloma formation, and/or altered pulmonary function in laboratory animals. Inhaled particles may be transported to other areas of the body. Methyl Ethyl Ketone is hazardous in case of inhalation (lung irritant). Toxicity of Vapor (LD50): 32 mg/m <sup>3</sup> – 4 hours (Mouse)
<b>Conditions aggravated by exposure</b>	Existing skin and pulmonary diseases may be aggravated by skin or inhalation exposure to carbon nanotubes. Methyl Ethyl Ketone causes damage to the lungs, peripheral nervous system, respiratory tract, skin, eyes, and central nervous system.

#### Section VII First Aid Measures Section

<b>Eye</b>	Flush with large amounts of water for at least 15 minutes, lifting the eyelids to separate them. Do not rub eyes or keep them closed. Seek medical assistance immediately.
<b>Skin</b>	Immediately wash with large amounts of water for 15 minutes, remove contaminated clothing, and seek medical assistance immediately.
<b>Ingestion</b>	Do not induce vomiting. Be sure person does not aspirate into lungs. Seek medical assistance immediately.
<b>Inhalation</b>	Remove to fresh air. Get medical assistance. If person isn't breathing, give artificial respiration.

### Section VIII Precautions for Safe Handling and Use

<b>Material Escape or Spills</b>	When managing spills or releases, wear a NIOSH-approved full face respirator with N-100 cartridges, gloves that are impervious to this chemical substance and lab coats or garments that are impervious to the chemical substance or DuPoint™ TYCHEM® garments must be worn. Absorb spill with inert material (vermiculite, sand, or earth) and vacuum areas with a HEPA filtration vacuum cleaner (>99.9% efficiency at sub micron particle size). Place in suitable container. Clean up immediately and avoid runoff into waterway and ground penetration. Dispose of properly.
<b>Waste Disposal</b>	Dispose in accordance with applicable laws.
<b>Handling</b>	Use proper personal protective equipment (see section IX). Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Do not breathe vapors.
<b>Storage</b>	Store in cool, dark, dry place. Keep away from heat, sparks, and flames.

### Section IX Control Measures

<b>Personal Protective Equipment (PPE)</b>	Respiratory protection is required under normal conditions of use. Open containers of this product must be handled in a fume hood or closed system equipped with HEPA filter under negative pressure. A NIOSH-approved full face respirator with N-100 cartridges must be used when handling this product. Avoid contact with skin. Gloves that are impervious to this chemical substance must be worn. Lab coats or garments that are impervious to the chemical substance or DuPoint™ TYCHEM® garments must be worn. Remove and discard all contaminated clothing upon exposure. Wear chemical goggles. If molten product use face shield if there is a splash potential.
<b>Chemical Hygiene</b>	Wash hands after handling material to minimize the spread of undetected skin contamination. All applicable laboratory safety guidelines should be followed when using this material.

### Section X Transportation Measures

<b>Proper Shipping Name</b>	Ethyl Methyl Ketone
<b>Hazard Class</b>	3
<b>Identification Number</b>	UN1193
<b>Packing Group</b>	II

### Section XI Regulatory Information

<b>Occupational Safety and Health Act (OSHA)</b>	This MSDS has been prepared in compliance with the
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	federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.
<b>Resource Conservation and Recovery Act (RCRA)</b>	This product is not specifically listed as hazardous waste under RCRA (40 CFR 261). However, it is strongly recommended that this product be treated as a hazardous waste and disposed of accordingly.
<b>SARA Title III: Section 313 Toxic Chemical List (TCL)</b>	This product contains does not contain chemicals at levels which require reporting under this statute.
<b>TSCA Section 8(b)-Inventory Status</b>	All chemical components of this product are listed and in compliance with TSCA inventory requirements.
<b>TSCA Section 12(b)-Export Notification</b>	This product does not contain any chemical(s) that are subject to a Section 12(b) export notification.

## Section XII Other

This information is provided for in good faith and is believed to be correct. Zyvex Performance Materials; however, makes no representation as to the comprehensiveness or accuracy of this information. Final determination of the suitability of this product and its safe use is the sole responsibility of the user. Accordingly, Zyvex Performance Materials will not be responsible for damages of any kind resulting from the use of or reliance upon the provided information.