



**HK 100AP Epoxy Adhesive
Material Safety Data Sheet**

Section I Product and Company Identification

Manufacturer	Zyvex Performance Materials
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Emergency	Chemtrec (North America): 800.424.9300 Chemtrec (International): 703.527.3887 (collect calls accepted)
Email	safety@zyvexpro.com
Product Name	HK 100AP
Chemical Name	Carbon nanotube (fullerene) functionalized in epoxy resin.
Issue Date	October 23, 2009

Section II Physical/Chemical Characteristics

Appearance/Odor	Black viscous resin / Slight odor
Solubility in water	Negligible
Specific gravity	Not available
Vapor pressure	0.03 mbar at 77°C (171°F)
Vapor density	>1
Evaporation rate	Not available
Boiling point	> 148°C (298°F)
Freezing point	Not available

Section III Physical/Chemical Characteristics

Substance	CAS Number	EINECS Number	Wt %	OSHA PEL
Solvent Naphtha (Petroleum), Light Arom.	28064-14-4	265-199-0	≤1%	None Established
Carbon Nanotube (Graphite)	7782-42-5	231-955-3	≤1%	Total Dust: 15mg/m3 Respirable

				Fraction: 5mg/m ³ (ACGIH) All Forms: 2mg/m ³
Proprietary Ingredient	Not Available	Not Available	≤1%	None Established
Talc	14807-96-6	238-877-9	≤1%	Respirable Fraction: 2 mg/m ³
Chlorite-group minerals	1318-59-8	215-285-9	≤1%	(ACGIH) TLV: 10 mg/m ³
Quartz	14808-60-7	238-878-4	≤1%	None Established
Glycidoxypropyl Trimethoxysilane	2530-83-8	219-784-2	≤1%	None Established
Siloxanes and Silicones, di-Me, Reaction Products With Silica	67762-90-7	Not Available	≤1%	(ACGIH) TLV: 2 mg/m ³
Oxirane, 2,2'-[1,4- butanediylbis(oxyethylene)]bis-	2425-79-8	219-371-7	≤6%	None Established
Bisphenol-A-(epichlorhydrin) epoxy resin	25068-38-6	500-033-5	≤73%	None Established
Calcium Carbonate	471-34-1	207-439-9	≤11%	Total Dust: 15 mg/m ³ (ACGIH) TLV: 10 mg/m ³
Silicon Dioxide	7631-86-9	231-545-4	≤2%	Total Dust: 10 mg/m ³

Section IV Fire and Explosion Hazard Data

Flash Point	93.33°C (199.99°F)
Explosion Limits	N/A
Extinguishing Media	Use water fog, foam, dry chemical, or carbon dioxide
Special Fire Fighting Procedures	Do not enter fire area without full bunker gear including positive pressure NIOSH-approved self-contained breathing apparatus. Water can be used to cool containers to prevent weakening of container structure.
Unusual Fire and Explosion Hazards	Material will not burn unless preheated.

Section V Reactivity Data

Stability	Stable under normal use conditions.
Incompatibility	Can react vigorously with strong oxidizing agents, strong Lewis or mineral acid, and strong mineral and organic bases. Avoid contact with water or liquids. Do not allow molten product to contact water or other liquids. This can cause violent eruptions, splatter hot material, or ignite flammable material.
Decomposition	Reaction with some curing agents may produce considerable heat and possible violent decomposition
Hazardous Polymerization	Will not occur.

Section VI Health Hazard Data

Toxicity	* Toxicity tests have not been performed on Zyvex Performance Materials products. Treat with caution. Pre-existing skin or lung allergies increase the chance of allergic reaction to exposure.
Eye	May cause irritation. Carbon nanotube toxicity is not known in humans. CNTs were not toxic to rabbit eye in Draize test. Contact with hot product can cause thermal burns which may result in permanent damage or blindness.

Skin	May cause skin sensitization and/or irritation. 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 of allergy-susceptible people. Contact with hot product can cause thermal burns which may result in permanent damage.
Ingestion	May cause nausea, vomiting, and gastric disturbance. Toxicity of carbon nanotubes is unknown. Low Toxicity, LD50>200 mg/kg.
Inhalation	May cause irritation and/or sensitization of respiratory tract. Toxicity of carbon nanotubes is not known in humans. Carbon nanotubes may cause pulmonary irritation, inflammation, granuloma formation, and/or altered pulmonary function in laboratory animals. Inhaled particles may be transported to other area of the body.
Conditions aggravated by exposure	Product should be treated as a hazard. Existing skin and pulmonary diseases may be aggravated by skin or inhalation exposure to carbon nanotubes.

Section VII First Aid Measures

Eye	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.
Skin	Immediately wash with large amounts of soap and water, remove contaminated clothing, and seek medical assistance if needed. In case of contact with hot product, immediately flood the affected area with cold water. Wipe excess material from exposed area. Flush exposed skin with water and follow by washing with soap. Carefully remove clothing; if clothing is stuck to burn area, do not pull it off, but, cut around it. Cover burn area with a clean material. Transport to nearest medical facility for additional treatment.
Ingestion	Do not induce vomiting. Have victim rinse out mouth with water, and then drink sips of water to remove taste from mouth. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Get medical advice.
Inhalation	Remove to fresh air immediately. Get medical assistance. If not breathing, give artificial respiration.

Section VIII Precautions for Safe Handling and Use

Material Escape or Spills	May burn not readily ignitable. Shut off leaks, if possible without personal risk. Ventilate area. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures: Dike and contain. Avoid runoff into waterway and ground penetration. Absorb with inert material (i.e., clay or sand) and place into non-leaking container. Dispose of properly. Flush area with water to remove trace residue. Large spills: Use vacuum trucks or pump to storage vessels. Soak up residue with inert material (i.e., clay or sand) and place into non-leaking container. Dispose of properly. Flush area with water to remove trace residue.
Waste Disposal	Dispose in accordance with applicable laws.
Handling	Use Personal Protective Equipment (see IX) and proper ventilation.
Storage	Store in cool, dry place with adequate ventilation. Keep containers closed when not in use. Keep away from ignition sources and high temperatures.

Section IX Control Measures

Personal Protective Equipment (PPE)	No respiratory protection is usually required under normal conditions of use. Use in well-ventilated area.
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	Avoid contact with skin. Protect hands with butyl or EVAL-laminate gloves when handling. Wear lab coat or other protective clothing to minimize contact. Remove and wash contaminated clothing upon exposure. Wear chemical goggles. If molten product use face shield if there is a splash potential.
Chemical Hygiene	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

DOT Proper Shipping Name	NOT REGULATED FOR TRANSPORT
DOT Hazard Class	NOT REGULATED FOR TRANSPORT
Identification Number	NOT REGULATED FOR TRANSPORT
Packaging Group	NOT REGULATED FOR TRANSPORT

Section XI Regulatory Information

Occupational Safety and Health Act (OSHA)	This MSDS has been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.
Resource Conservation and Recovery Act (RCRA)	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.
SARA Title III: Section 313 Toxic Chemical List (TCL)	This product contains does not contain chemicals at levels which require reporting under this statute.
TSCA Section 8(b)-Inventory Status	All chemical components of this product are listed and in compliance with TSCA inventory requirements.
TSCA Section 12(b)-Export Notification	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. Zyx 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, Zyx Performance Materials will not be responsible for damages of any kind resulting from the use of or reliance upon the provided information.
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