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## SAFETY DATA SHEET

Version 9  
Revision Date 08/19/2016

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### 1. PRODUCT AND COMPANY IDENTIFICATION

#### 1.1 Product Identifiers

Product Name: Pyrograf III<sup>®</sup> Carbon Nanofiber, LHT Grade  
Product Number: N/A  
Brand: Pyrograf Products, Inc.

#### 1.2 Relevant Identified Uses of the Substance of Mixture and Uses Advised Against

Identified uses: Laboratory chemicals, synthesis of substances

#### 1.3 Details of the Supplier of the Safety Data Sheet

Company: Pyrograf Products, Inc.  
154 West Xenia Ave., PO Box 579  
Cedarville, OH 45314-0579  
USA

Telephone: (937)-766-2020  
Fax: (937)-766-4878

#### 1.4 Emergency Telephone Number

Emergency Phone Number: 1-800-222-1222 (National Poison Control Hotline)

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### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the Substance or Mixture

##### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Eye irritation (Category 2A), H319

Specific target organ toxicity – single exposure (Category 3), Respiratory system, H335

For full text of the H-Statements mentioned in this Section, see Section 16.

#### 2.2 GHS Label Elements, Including Precautionary Statements

Pictogram



Signal Word: WARNING

Hazard Statements

H319 Causes serious eye irritation

H335

May cause respiratory irritation

**Precautionary Statement**

Avoid inhalation of dusts/fumes/gases/mists/vapors/spray. Use in well-ventilated areas only. Thoroughly wash skin after handling. Wear eye and face protection.

IF INHALED: Remove person from contaminated area to fresh air for breathing and keep comfortable. Call the EMERGENCY TELEPHONE NUMBER (Poison Control, section 1.4) if are experiencing discomfort.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, seek medical attention. Store in a well-ventilated place. Keep container tightly closed and locked up. Dispose of contents to an approved waste disposal plant.

IF SWALLOWED: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult physician.

**2.3 Hazards Not Otherwise Classified (HNOC) or Covered by GHS**

None.

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**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**3.1 Substances**

Chemical Name: Carbon Nanofiber  
Synonyms: PR-19/24/25-XT-LHT-(AM)  
Formula: C  
Molecular Weight: 12.01 g/mol

**Hazardous Components**

Component	Concentration
Carbon Fiber	> 98 wt %
Iron	< 1.4 wt %
Sulfur	< 0.8 wt %
Mineral content	< 1 wt % from H <sub>2</sub> O

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**4. FIRST-AID MEASURES**

**4.1 Description of First-Aid Measures**

**General**

Exit contaminated area. Consult a physician. Show this safety data sheet (SDS) to your health care personnel.

**If Inhaled**

Move person into fresh air. If not breathing, give artificial respiration. Consult a physician or nearest health care personnel.

**Skin Exposure**

Rinse thoroughly with plenty of soap and water. Consult a physician or nearest health care personnel.

**Eye Contact**

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Consult a physician or nearest health care personnel.

**If Swallowed**

Never give anything to an unconscious person. Rinse mouth with water. Consult a physician or nearest health care personnel.

**4.2 Most Important Symptoms and/or Effects: Both Acute and Delayed**

The most important known symptoms and effects are described in the labelling (see section 2.2 and/or section 11).

**4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed**

No data available.

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**5. FIRE-FIGHTING MEASURES****5.1 Extinguishing Media****Suitable Extinguishing Media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**5.2 Special hazards arising from the Substance or Mixture**

No data available.

**5.3 Recommendations for Firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

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**6. ACCIDENTAL RELEASE MEASURES****6.1 Personal Precautions, Protective Equipment and Emergency Procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist, dust, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection, see section 8.

**6.2 Environmental Precautions**

Do not allow product to enter drainage systems.

**6.3 Methods and Materials Used for Containment**

Carefully pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**6.4 Reference to Other Sections**

For disposal see section 13.

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**7. HANDLING AND STORAGE**

### **7.1 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 preventative fire protection. For precautions see section 2.2.

### **7.2 Conditions for Safe Storage, Including Any Incompatibilities**

Keep container tightly closed in a dry and well-ventilated area.

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## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **8.1 Control Parameters**

#### **Components with Workplace Control Parameters**

Contains no substances with occupational exposure limit values.

### **8.2 Exposure Controls**

#### **Appropriate Engineering Controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the work day.

#### **Personal Protective Equipment**

##### **Eye/Face 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 Protection**

Handle with gloves. Gloves should be inspected prior to use. Use proper glove removal technique by not 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. Wash and dry hands thoroughly.

##### **Full Contact**

Material: Nitrile Rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 minutes

Molded Nitrile gloves impervious to nanomaterials (tested and passed with ASTM standard F739).

##### **Splash Contact**

Material: Nitrile Rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 minutes

If used in solution, or mixed with other substances, and other conditions, contact the supplier of the gloves. This recommendation is advisory only and must be determined by an industrial hygienist and/or safety officer familiar with the

specific situation of anticipated use by our customers. It should not be constructed as offering an approval for any specific use scenario.

### **Body**

Clothing impervious to nanomaterials, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace (passed ASTM standard F739)

### **Respiratory**

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 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). The EPA mandates the use of full face respirators with minimum N100 grade cartridges if there is any risk of exposure to carbon nanomaterial dust.

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## **9. PHYSICAL AND CHEMICAL PROPERTIES**

### **9.1 Information on Basic Physical and Chemical Properties**

a. Appearance	Black powder/agglomerates, nanoparticles
b. Odor	No data available
c. Odor Threshold	No data available
d. pH	No data available
e. Melting point	3,652 – 3,697 °C (6,606 – 6,687 °F)
f. Freezing point	No data available
g. Initial boiling point/range	No data available
h. Flash point	No data available
i. Flammability	No data available
j. Evaporation Rate	No data available
k. Upper/lower flammability or explosive limit	No data available
l. Vapor pressure	No data available
m. Vapor density	No data available
n. Relative density	2 - 20 lbs/ft <sup>3</sup>
o. Nanofiber density	1.55 – 1.70 g/cc
p. Water solubility	No data available
q. Partition coefficient: n-octal/water	No data available
r. Auto-ignition temperature	No data available
s. Decomposition temperature	No data available
t. Viscosity	No data available
u. Explosive properties	No data available
v. Oxidizing properties	No data available

### **9.2 Other Information**

Particle diameter: 0.2 micron

The nanofiber density includes with volumes of the hollow core of the nanofiber. The density of the nanofiber wall is 2.0 - 2.1 g/cc.

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## **10. STABILITY AND REACTIVITY**

### **10.1 Reactivity**

No data available

### **10.2 Chemical Stability**

Stable under recommended storage conditions.

### **10.3 Possibility of Hazardous Reactions**

No data available

### **10.4 Conditions to Avoid**

No data available

### **10.5 Incompatible Materials**

Strong oxidizing agents.

### **10.6 Hazardous Decomposition Products**

Hazardous decomposition formed under fire conditions. The exact nature of decomposition is unknown.

Other decomposition products: No data available

In the event of a fire, see section 5.

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## **11. TOXICOLOGICAL INFORMATION**

### **11.1 Information on Toxicological Effects**

#### **Acute Toxicity**

No data available

Inhalation: No data available

Dermal: No data available

#### **Skin Corrosion/Irritation**

No data available

#### **Serious Eye Damage/Eye Irritation**

No data available

#### **Respiratory or Skin Sensitization**

No data available

#### **Germ Cell Mutagenicity**

No data available

#### **Carcinogenicity**

IRAC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IRAC.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

**Reproductive Toxicity**

No data available

**Specific Target Organ Toxicity**

May cause respiratory irritation via inhalation.

**Specific Target Organ Toxicity – Repeated Exposure**

No data available

**12. ECOLOGICAL INFORMATION**

No data available

**13. DISPOSAL CONSIDERATIONS**

**13.1 Waste Treatment Methods**

**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company according to applicable federal, state and local environmental regulations. May be placed in an industrial hazardous waste incineration process.

**Contaminated Packaging**

Dispose of as unused product.

**14. TRANSPORT INFORMATION**

Land transport (DOT)	Not dangerous goods
Sea Transport (IMDG)	Not dangerous goods
Air Transport (ICAO/IATA)	Not dangerous goods

**15. REGULATORY INFORMATION**

**US Toxic Substances Control Act**

Product is listed on the TSCA chemical inventory.

The TSCA Section 5(e) Consent Order issued for this product has set provisions for the end user when this product is used in a commercial application. It is important that Pyrograf Products, Inc. be notified prior to placing this product into a commercial

application, as information may be needed to determine the extent of regulatory oversight. This product is subject to an Order issued under Section 5(e) of TSCA, to the TSCA Section 12(b) export notice requirement, and to the TSCA Section 8(b) chemical inventory.

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## 16. OTHER INFORMATION

### H-Statements

Eye. Irrit.	Eye irritation
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
STOT SE	Specific target organ toxicity – single exposure

### HMIS Rating

Health Hazard:	2
Chronic Health Hazard:	0
Flammability:	0
Physical Hazard:	0

### NFPA Rating

Health Hazard:	2
Chronic Health Hazard:	0
Flammability:	0
Physical Hazard:	0

### Further Information

All carbon nanofibers are solid particles. Carbon nanofibers and their associated dust/shards may cause temporary irritation of the skin, eye, nasal passages, throat, upper respiratory tract, or gastrointestinal tract.

All forms of Pyrograf-III carbon nanofiber meet the definition of a respirable fiber (i.e. containing a length greater than 5 microns, a largest cross-sectional width less than 3 microns, and a length to cross-sectional width ratio greater than 3:1). Respirable fibers, dusts and shards may cause lung damage or disease.

During operations involving moving or mechanically working with this product, airborne fibers, shards, and dust may be generated. Any recipients of this product should assess their workplaces, processes, and material/products to determine if handling, processing, and/or incorporating Pyrograf-III carbon nanofibers in anyway allows for these fibers to become airborne in an open atmosphere. If so, recipients should take necessary precautions to protect people who may be exposed to Pyrograf-III carbon nanofibers.

This SDS is based upon data, information and other resources available at the time of the revision date listed. The information contained within this SDS is considered accurate, to the extent known by Pyrograf Products, Inc. Pyrograf Products, Inc. assumes no legal responsibility for reliance or use of the information in this SDS.