

SAFETY DATA SHEET  
CELTIG LLC  
Cicarbo™ Graphene Nanosheets (GNS-NCG015)

Date Issued: Jan 2016

**SECTION I – PRODUCT AND COMPANY INFORMATION**

Supplier's Name & Address:           CELTIG  
**Emergency No.**                       927 Gothic Manor Way  
**(865) 622-9818**                       Knoxville, TN 37923

General Chemical Composition:       Carbon

**SECTION II – HAZARDS IDENTIFICATION**

Classification:                         Graphene is not currently listed as a hazardous material under US Federal regulations. It is not listed under the Clean Air Act, the Clean Water Act, SARA (section 302, section 311/312, or section 313), HAPS, or IAR

Hazard Statement                       May cause damage to lung through prolonged or repeated inhalation



Precautionary Statement               May causes serious eye irritation.  
May cause respiratory irritation.  
May form combustible dust concentrations in air.  
Use personal protective equipment as required.  
If exposed or concerned: seek medical attention/advice.

**SECTION III – COMPOSITION/INFORMATION ON INGREDIENT**

Color:                                     Black

Ingredients:

<b>CAS Number</b>	<b>Wt %</b>	<b>Component Name</b>
7782-42-5	≥ 95.5	Graphene Platelets (Carbon)
7732-18-5	≤ 0.75	Water (Moisture)
7704-34-9	≤ 0.10	Sulfur

Exposure Limits:                       No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

**SECTION IV – FIRST AID MEASURES**

Eye Contact                             Gently lift the eyelids and flush immediately and continuously with ample amounts of water for at least 15 minutes. Consult physician for treatment.

Skin Contact                            Quickly remove contaminated clothing. Rinse with large amounts of water for at least 15 minutes. Wash affected area with soap and water. For reddened or blistered skin, consult a physician.

Ingestion                                Wash out mouth with water. Remove victim to fresh air and keep at rest

	in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Inhalation	Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration and seek medical attention immediately.
<b>SECTION V – FIRE-FIGHTING MEASURES</b>	
Suitable Extinguishing Media	Use water spray, dry powder, foam, or carbon dioxide. Do not allow water runoff to enter sewers or drains.
Fire Fighting Instructions	<p>Dust generated in handling this material may present a potential fire and explosion hazard if suspended in air at high concentrations. Settled dust presents a fire hazard. Re-suspension of the dust into the air by vibration, traffic, material handling, etc. in high concentrations in the presence of an ignition source could result in a dust explosion. Do NOT use a solid stream of water. A solid stream of water can cause a dust explosion. Fire fighters and others who may be exposed to products of combustion should wear full firefighting turn-out gear and self-contained breathing apparatus. Firefighting equipment should be thoroughly decontaminated after use.</p> <ul style="list-style-type: none"> <li>• Special hazards caused by the material or the combustion products: In the event of a fire, carbon dioxide, carbon monoxide, or other toxic gases may be released.</li> <li>• Protective equipment: Wear self-contained breathing apparatus for firefighting if necessary.</li> </ul>
<b>SECTION VI – ACCIDENTAL RELEASE MEASURES</b>	
Personal Precautions	Use personal protective equipment. Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes, and clothing.
Environmental Precautions	Avoid release to the environment.
Methods for Containment and Clean Up	Sweep up or vacuum up spillage and collect in a suitable container for disposal. Avoid dust formation.
<b>SECTION VII – HANDLING AND STORAGE</b>	
Precautions for Safe Handling	Do not breathe dust. Avoid contact with eyes, skin, and clothing. Wear proper protective clothing and equipment. Ensure adequate ventilation. Do not eat, drink, or smoke when using this material. Minimize the generation and accumulation of dust. Avoid creating dust during handling, transfer or clean up and prevent dust accumulation e. g. by wetting and careful handling. Keep dust away from open flames, hot surfaces, strong oxidizers, and sources of ignition. Follow good housekeeping practices to keep surfaces, including areas overhead such as piping, ductwork, etc., free from settled dust. Clean all work areas as necessary, using either an explosion-proof HEPA vacuum cleaner or wet wiping methods. Dry powders can build static electricity charges when subjected to friction of transfer and in mixing operations. Graphene is electrically conductive and may cause a short circuit in electrical equipment. Provide adequate precautions, such as grounding and/or inert atmospheres.
Conditions for Safe Storage	Store in closed containers. Keep away from ignition sources and strong

oxidizers.

**SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTON FOR ROUTINE HANDLING AND/OR SPILLS**

Repeated or prolonged exposure or overexposure to dust.	None established. It is recommended that exposure levels be maintained as low as possible by following good industrial hygiene practice so as to minimize any potential for lung effects. Skin exposure should also be minimized.
Engineering Controls	Use only with adequate controls such as a source enclosure or local exhaust ventilation to minimize worker exposure. For operations where airborne particulates are possible, in general technologies that are adequate for the control of asbestos fibers (for example: closed systems, enclosures with negative pressure, HEPA filtered exhaust, and wet methods in conjunction local exhaust ventilation) should be effective in the control of engineered nanoparticles. It is recommended that all dust control equipment, such as local exhaust ventilation and material transport systems, involved in handling this product contain explosion relief vents, an explosion suppression system and/or an oxygen deficient environment. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e. there is no leakage from the equipment).
Respiratory Protection	If needed, an approved respirator with high efficiency particulate filters may be used. For higher exposures, a supplied air respirator may be required. Respirator selection and use should be based on contaminant type, form and concentration. Follow applicable regulations and good Industrial Hygiene practice. Use only with adequate controls such as a source enclosure or local exhaust ventilation to minimize worker exposure. For operations where airborne particulates are possible, in general, use technologies that are adequate for the control of asbestos.
Eye Protection	Use proper protection – safety glasses as a minimum.
Skin Protection	Impervious gloves such as rubber are recommended.
Waste Disposal Method	If media becomes wet, store for waste disposal in plastic lined containers. Dispose of contaminated media in accordance with federal, state, and local regulations.

**SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES**

Physical Description	Black (and a hint of grey) powder
Density	158 kg/m <sup>3</sup>
Solubility	Insoluble
Auto-ignition Temperature	452°C

**SECTION X – STABILITY AND REACTIVITY**

Reactivity	Not reactive under standard conditions. Reactive at high temperature in the presence of oxidizer.
Chemical Stability	Stable
Possibility of Hazardous Reactions	Reaction with oxidizer could be highly exothermic. Also carbon dioxide,

carbon monoxide, or other toxic gases may be released.

Conditions to Avoid

Heat, sparks, flames and all other ignition sources, strong oxidizers.

**SECTION XI – TOXICOLOGICAL INFORMATION**

Health Effects of Exposure:	The toxicity of graphene has not been fully investigated. All exposure to graphene nanoparticles by inhalation or skin contact should be minimized.
Eye	May cause irritation.
Ingestion	Not likely to be a relevant route of exposure; however, repeated ingestion or swallowing large amounts may cause internal injury.
Inhalation	Inhalation of dust may irritate the nose, throat, and upper respiratory tract.
Skin	Effects have not yet been fully evaluated.
Chronic Effects of Exposure	Effects have not yet been fully evaluated. However, prolonged or repeated exposure should be avoided unless proper protective equipment/clothing is used.
Reproductive Toxicity	Effects have not yet been fully evaluated. No adverse effects are expected.
STOT - single exposure	Respiratory system
STOT - repeated exposure	Lungs
Germ Cell Mutagenicity	Effects have not yet been fully evaluated. No adverse effects are expected.
Numerical Measures of Toxicity	No data available

**SECTION XII – ECOLOGICAL INFORMATION**

Ecotoxicity	Do not discard graphene into drains.
Persistence and Degradability	No information available.
Bioaccumulation/ Accumulation	No information available.
Mobility	No information available

**SECTION XIII – DISPOSAL CONSIDERATIONS**

Graphene is not listed as RCRA hazardous waste.  
Confirm with state or local regulations before disposal.

**SECTION XIV – TRANSPORT INFORMATION**

DOT	Not regulated.
TDG	Not regulated.
IMDG/IMO	Not regulated.
ATA	Not regulated.

**SECTION XV – REGULATORY INFORMATION**

Contents of this SDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

None of the chemicals in this product appear on any of following lists:

Health & Safety Reporting List

Chemical Test Rules

TSCA Section 12(b)

TSCA Significant New Use Rule

SARA Section 302 Extremely Hazardous Substances

OSHA (Not included in highly hazardous list)

Clean Water Act Not Applicable

Clean Air Act Not Applicable

**SECTION XVI – OTHER INFORMATION**

Prepared by Celtig LLC

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Revised Section I and II

**Disclaimer**

The information provided is based on the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process.