1. IDENTIFICATION

Product Identifier
Product Name
Nuon Lithium Manganese Dioxide (Coin)

Other means of identification
SDS #
GLI-001

Synonyms
Lithium (CR) Primary Battery (non-rechargeable).

Recommended use of the chemical and restrictions on use
Recommended Use
Battery.

Details of the supplier of the safety data sheet
Distributor
GlobTek, Inc.
186 Veterans Drive, Northvale, NJ 07647 USA +1-201-784-1000

Emergency Telephone Number
Emergency Telephone (24 hr)
INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Emergency Overview
Safety Data Sheets (SDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees. Because all of our batteries are defined as "articles", they are exempt from the requirements of the Hazard Communication Standard, hence an SDS is not required. However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

Appearance
Geometric, solid object

Physical state
Solid

Classification

The chemicals listed in section 3 are contained in a sealed container. Risk of exposure only occurs if battery is mechanically, thermally, or electrically abused.

Other hazards
Harmful to aquatic life with long lasting effects
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Lithium (CR) Primary Battery (non-rechargeable).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>CAS No</td>
</tr>
<tr>
<td>Manganese dioxide</td>
<td>1313-13-9</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>108-32-7</td>
</tr>
<tr>
<td>1,3-Dioxolane</td>
<td>646-06-0</td>
</tr>
<tr>
<td>Lithium</td>
<td>7439-93-2</td>
</tr>
<tr>
<td>Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-lithium salt</td>
<td>90076-65-6</td>
</tr>
<tr>
<td>Lithium trifluoromethanesulfonate</td>
<td>33454-82-9</td>
</tr>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>1333-86-4</td>
</tr>
</tbody>
</table>

**If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.**

4. FIRST-AID MEASURES

**First Aid Measures**

**General Advice**
The following information applies if the battery is mechanically, thermally, or electrically abused.

**Eye Contact**
Immediately flush eyes with water for 30 minutes while lifting the upper and lower lids. Get medical attention.

**Skin Contact**
Flush affected area with lukewarm water for at least 30 minutes. If skin irritation persists, call a physician.

**Inhalation**
If symptoms are experienced, remove source of contamination or move victim to fresh air. Get medical attention.

**Ingestion**
Do not induce vomiting. Call a physician or Poison Control Center. National battery ingestion hotline: 202-625-3333.

**Most important symptoms and effects**

**Symptoms**
May cause irritation to the eyes, skin, gastrointestinal, and respiratory systems. A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.

**Indication of any immediate medical attention and special treatment needed**

**Notes to Physician**
Electrolyte is immobilized and completely secured within battery. If battery is opened, acute and chronic-electrolyte (DME) is slightly to moderately toxic.

5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media**
For burning battery in bulk quantities of unpacked cells, use Class D extinguishers; Lith-X, Powdered graphite.

**Unsuitable Extinguishing Media**

**Specific Hazards Arising from the Chemical**
Cells may rupture when exposed to excessive heat. This could result in the release of flammable or corrosive materials.

**Hazardous Combustion Products** Carbon monoxide. Carbon dioxide (CO2). Lithium oxides.

**Protective equipment and precautions for firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

**Personal Precautions**
Use personal protective equipment as required. Ventilate affected area.

**Other Information**
The material contained within the batteries is only expelled under abusive conditions.

**For Emergency Responders**
If the battery material is released, remove personnel from the area until fumes dissipate.

**Environmental precautions**

**Environmental precautions**
See Section 12 for additional Ecological Information.

**Methods and material for containment and cleaning up**

**Methods for Containment**
Prevent further leakage or spillage if safe to do so.

**Methods for Clean-Up**
Avoid contact with electrolyte. Wear protective gloves, and place in container filled with oil and wrap tightly in a polyethylene bag. For waste disposal, see section 13 of the SDS.

### 7. HANDLING AND STORAGE

**Precautions for safe handling**

**Advice on Safe Handling**
Do not expose battery or cell to extreme temperatures or fire. Do not disassemble, crush or puncture battery. Avoid mechanical or electrical abuse. Do not short circuit.

**Conditions for safe storage, including any incompatibilities**

**Storage Conditions**
Insulate positive and negative terminals to avoid short circuit. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Protect from direct sunlight. Prevent condensation on cells or battery terminals. Elevated temperatures may result in reduced battery life.

**Incompatible Materials**
If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons. Water with internal contents of battery.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance</td>
<td>TWA: mg/m³</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Manganese dioxide 1313-13-9</td>
<td>0.02</td>
<td>Mn respirable fraction</td>
<td></td>
</tr>
<tr>
<td>1,3-Dioxolane 646-06-0</td>
<td>0.1</td>
<td>Mn inhalable fraction</td>
<td></td>
</tr>
<tr>
<td>Graphite 7782-42-5</td>
<td>2</td>
<td>Mn respirable fraction</td>
<td></td>
</tr>
<tr>
<td>Carbon Black 1333-86-4</td>
<td>3</td>
<td>Mn inhalable fraction</td>
<td></td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

**Engineering Controls**

Apply technical measures to comply with the occupational exposure limits. Showers. Eyewash stations. Ventilation systems.

**Individual protection measures, such as personal protective equipment**

**Eye/Face Protection**

Always wear safety glasses when working with batteries and cells. Refer to 29 CFR 1910.133 for eye and face protection regulations.

**Skin and Body Protection**

Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and Viton rubber gloves, Protective clothing.

**Respiratory Protection**

Not necessary under conditions of normal use. In case of battery venting or rupture, use a self contained full face respiratory mask.

**General Hygiene Considerations**

Handle in accordance with good industrial hygiene and safety practice.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
<td>Odor</td>
</tr>
<tr>
<td>Appearance</td>
<td>Geometric, solid object</td>
<td>Not determined</td>
</tr>
<tr>
<td>Color</td>
<td>Not determined</td>
<td>Odor Threshold</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Melting Point/Freezing Point</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Boiling Point/Boiling Range</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Flammability (Solid, Gas)</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Flammability Limits</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Lower Flammability Limit</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization
Hazardous polymerization does not occur.

Conditions to Avoid
Heating, mechanical and electrical abuse. Moisture, recharge, disassembly.

Incompatible Materials
If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons. Water with internal contents of battery.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information
Inhalation, skin contact and eye contact are possible when the battery is opened. The following is based on exposure to internal contents

Eye Contact
Corrosive fumes will be very irritating to eyes.

Skin Contact
Contents of an open battery may be absorbed through the skin causing localized inflammation.

Inhalation
Contents of an open battery can cause respiratory irritation. Inhalation of vapors may cause irritation of the upper respiratory tract and lungs.

Ingestion
Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of the mouth, esophagus, and gastrointestinal tract.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ATEmix (oral)</th>
<th>ATEmix (dermal)</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td>9000 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1313-13-9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>984 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7439-89-6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Information on physical, chemical and toxicological effects

Symptoms
Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td></td>
<td></td>
<td>Reasonably Anticipated</td>
<td>X</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>A3</td>
<td>Group 2B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend
- **ACGIH (American Conference of Governmental Industrial Hygienists)**
  - A3 - Animal Carcinogen
- **IARC (International Agency for Research on Cancer)**
  - Group 2B - Possibly Carcinogenic to Humans
- **NTP (National Toxicology Program)**
  - Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
  - OSHA (Occupational Safety and Health Administration of the US Department of Labor)
    - X - Present

12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron 7439-89-6</td>
<td></td>
<td>13.6: 96 h Morone saxatilis mg/L LC50 static</td>
<td></td>
</tr>
<tr>
<td>Propylene carbonate 108-32-7</td>
<td>500: 72 h Desmodesmus subspicatus mg/L EC50</td>
<td>5300: 96 h Leuciscus idus mg/L LC50 static 1000: 96 h Cyprinus carpio mg/L LC50 semi-static</td>
<td>500: 48 h Daphnia magna mg/L EC50</td>
</tr>
<tr>
<td>Carbon Black 1333-86-4</td>
<td></td>
<td></td>
<td>5600: 24 h Daphnia magna mg/L EC50</td>
</tr>
</tbody>
</table>

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide 1313-13-9</td>
<td>&lt;0</td>
</tr>
<tr>
<td>Propylene carbonate 108-32-7</td>
<td>0.48</td>
</tr>
<tr>
<td>1,3-Dioxolane</td>
<td>-0.37</td>
</tr>
</tbody>
</table>
**13. DISPOSAL CONSIDERATIONS**

**Waste Treatment Methods**

**Disposal of Wastes**

Lithium batteries are best disposed as a non-hazardous waste when fully or mostly discharged. The Federal Environmental Protection Agency (EPA) (governed by the Resource Conservation and Recovery Act (RCRA)) do not list or exempt lithium as a hazardous waste. However, if waste lithium batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amounts of unreacted lithium in the battery. The batteries must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste (as required by the U.S. Land Ban Restrictions for the hazardous and Solid Waste Amendments of 1984.) Secondary treatment center receive these batteries as manifested hazardous waste under code"D003-reactive." Use a professional disposal firm for disposal of mass quantities of charged lithium batteries. Consult your local environmental officer. Do not incinerate. Dispose of in accordance with federal, state and local environmental regulations.

**Contaminated Packaging**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

**14. TRANSPORT INFORMATION**

**Note**

Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

**DOT**

Please contact manufacturer for most current information

**IATA**

Please contact manufacturer for most current information

**IMDG**

Please contact manufacturer for most current information

**15. REGULATORY INFORMATION**

**International Inventories**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TSCA</th>
<th>DSL/NDSSL</th>
<th>EINECS/E LINCS</th>
<th>ENCS</th>
<th>IECSC</th>
<th>KECL</th>
<th>PICCS</th>
<th>AICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Iron</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>1,3-Dioxolane</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lithium</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Graphite</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Methanesulfonamidem, 1,1,1-trfluoro-N-[(trifluoromethyl)sulfonyl]-,lithium salt</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Present</td>
<td>X</td>
<td>Present</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lithium trifluoromethanesulfonate | X | X | X | Present | X | Present  
Carbon Black | X | X | X | Present | X | Present

Legend:
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
- ENCS - Japan Existing and New Chemical Substances
- IECSC - China Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances
- AICS - Australian Inventory of Chemical Substances

US Federal Regulations

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide - 1313-13-9</td>
<td>1313-13-9</td>
<td>12-42</td>
<td>1.0</td>
</tr>
</tbody>
</table>

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Black - 1333-86-4</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide 1313-13-9</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1,3-Dioxolane 646-06-0</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lithium 7439-93-2</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Graphite 7782-42-5</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon Black 1333-86-4</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
## 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Instability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Physical hazards</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

**Issue Date:** 09-Oct-2013  
**Revision Date:** 30-Mar-2016  
**Revision Note:** New product

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text.

End of Safety Data Sheet