

## Material Safety Data Sheet (MSDS)

The information contained within is provided as service to our customers and for their information only.

The information and recommendations set forth herein are made in good faith and are believed to be accurate as the date of preparation or revision.

iG3N makes no warranty expressed or implied and disclaims all liabilities from reliance on it.

### 1. Section 1-Identification

#### 1.1 Product Name and Description:

##### 1.1.1. I-Node Battery (Lithium Iron Phosphate Battery)

1.1.1.1. CHEMICAL NAME: Lithium Iron Phosphate

1.1.1.2. CHEMICAL FAMILY: Lithium Ion

1.1.1.3. CHEMICAL FORMULA: LiFePO<sub>4</sub>

1.1.1.4. Classification according to GHS: Not a dangerous substance

##### 1.1.2. Product models

1.1.2.1. i-Node (5.6) Master

1.1.2.2. i-Node (11.2) Master and Slave

1.1.2.3. i-Node (16.8) Master and Slave

1.1.2.4. i-Node (22.4) Master and Slave

1.1.2.5. i-Node (22.4)\*X or 10 Node Packs

### 2. Manufacturer details

Office Address	Telephone Numbers for information
Unit 3, 8 Incubation drive, Riverside view Ext.15 Fourways, Midrand, 2021 South Africa	Telephone: +27 010 006 0157 Emergency Telephone: +27 010 006 0157 Email: <a href="mailto:info@i-g3n.com">info@i-g3n.com</a> Date of revision: May-31-2019

### 3. Section 3- Composition Information

Chemical Composition	Cas No.	Cas No.	Weight (%)
Lithium iron Phosphate	LiFePO <sub>4</sub>	15365-14-7	27.11
Graphite	C24X12	7782-42-5	16.27
PP Separator	(C <sub>3</sub> H <sub>6</sub> ) <sub>n</sub>	9003-07-0	3.14
Electrolyte	LiPF <sub>6</sub> : C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	21324-40-3;108-32-7	20.46
Cu Foil	Cu	7440-50-8	5.22
Al Foil	Al	7429-90-5	9.83

PvDF	(C <sub>2</sub> HCF <sub>2</sub> ) <sub>n</sub>	24937-79-9	1.64
Al Shell	Al	7429-90-5	8.80
Al Cover	Al	7429-90-5	5.76
Cu Terminal	Cu	7440-50-8	1.77

#### 4. Section 4- Hazards Identification

The chemicals are contained inside fully sealed plastic or metal cells, which are in turn contained inside a robust steel casing.

Avoid mechanical or electrical abuse, storage preferably in cool, dry and ventilated area. Which is subject to little temperature change.  
Storage at high temperatures should be avoided.

Thermal abuse is unlikely as the cell stability and integrity will be preserved up to at least 70 degrees Celsius.

Electrical abuse is also highly unlikely because the battery has built in electrical protection devices, eliminating the possibility of short circuits or excessive currents passing through the cells unless extreme damage to the casing causes internal short circuiting of the main cell connections.

#### 5. Section 5- First Aid Measures

Eye Contact	Flush eyes with water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical assistance immediately
Skin Contact	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Seek medical assistance immediately
Inhalation	Remove affected persons from exposure and move into a clean air environment immediately Use oxygen if available. Seek medical advice

Ingestion	<p>Drink at least to glasses of milk or water, induce vomiting unless patient is unconscious.</p> <p>Seek medical assistance immediately or emergency services</p> <p>Consult a physician or local poison control centre immediately</p>
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6. Section 6- Fire Fighting Measures

6.1 Dry chemical or water type extinguishers are the most effective means to extinguish a cell or battery fire

6.2 A carbon dioxide (CO<sub>2</sub>) extinguishers also effective

Flash point	N/A
Auto-ignition temperature	N/A
Extinguishing media	Water , CO <sub>2</sub>
Special fire fighting procedures	Self-contained breathing apparatus
Unusual fire and explosion hazards	Cell may vent when subjected to excessive heat-exposing battery contents
Hazardous combustion Products	Carbon monoxide ,carbon dioxide, lithium oxide fumes

7. Section 7- Accidental Release Measures

7.1 Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personal from the area until fumes dissipate.

Steps to be taken in case material is released or spilled:

If leakage of the battery happens, liquid could be absorbed with sand.

Provide maximum ventilation to clear out hazardous gases. Avoid skin and eyes contact or inhalation of vapours.

8. Section 8- Handling and Storage

8.1 Handling – The battery should not be opened, destroyed or incinerated, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container

8.2 Don't not place the battery near heating equipment, nor expose to direct sunlight for long periods

8.3 The cells may explode if they are disassembled, crushed or exposed to fire or high temperatures

8.4 Avoid mechanical or electrical abuse.

8.5 Do not short circuit the battery

9. Section 9- Exposure controls and Personal Protection

9.1 Engineering controls: Use local ventilation or other engineering controls to control the sources of dust, mist, fumes and vapour

9.2 RESPIRATION PROTECTION: Not necessary under conditions of normal use or handling. In case of battery venting or rupture with excessive leakage, use a self-contained full-face respiratory mask while handling.

9.3 EYE PROTECTION: Not necessary under conditions of normal use or handling with excessive leakage. In case of battery rupture or leakage, use safety goggles when handling.

9.4 SKIN/HAND PROTECTION: Not necessary under conditions of normal use or handling. In case of battery rupture or leakage, wear rubber apron and Viton rubber gloves while handling

CAS No.	ACGIH	NIOSH	OSHA
15365-14-7	N/A	N/A	N/A
7782-42-5	TLV-TVVA 2mg/m	ELs-TWA 2.5mg/m	PELs-TWA 15mppcf
7440-50-8	TLV-TWA 0.2mg/m <sup>3</sup> TLV- TWA 1mg/m <sup>3</sup>	RELs-TWA 1mg/m	PELs-TWA 5mg/m <sup>3</sup> PELs- TWA 15mg/m <sup>3</sup>

10. Section 10- Physical and Chemical Properties

Odour	N/A
pH	N/A
Melting point /freezing point	N/A
Boiling Point and Boiling range	N/A
Flash point	N/A
Upper/lower flammability or explosive limits	N/A
Vapours pressure	N/A
Vapour Density	N/A
Relative Density	N/A
Solubility in water	N/A
Auto-ignition temperature	N/A
Decomposition temperature	N/A
Evaporation rate	N/A
Flammability (Soil, Gas)	N/A
Viscosity	N/A
Form	Solid
Colour	Blue

#### 11. Section 11- Stability and Reactivity

STABILITY: Stable

CONDITIONS TO AVOID: Heating, mechanical and electrical abuse.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, Carbon Dioxide, Lithium oxide fumes.

INCOMPATIBILITIES MATERIALS: Oxidizing agents, acid, base

HAZARDOUS POLYMERIZATION: N/A

#### 12. Section 12- TOXICOLOGICAL INFORMATION

Inhalation, skin contact and eye contact are possible when the battery or cell is punctured. Exposure to internal contents and the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibroid lung injury and membrane irritation

#### 13. Section 13- ECOLOGICAL INFORMATION

When properly used or disposed, the batteries do not present an environmental hazard.

#### 14. Section 14- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Recycling is encouraged. Dispose of in accordance with local, state and federal laws and regulations

15. Section 15- TRANSPORT INFORMATION

Label	Lithium Battery Label
UN Number:	UN 3480
Packing Group	II
Marine pollutant	NO
UN Proper shipping Name	Lithium ion Batteries

Lithium Iron Phosphate Battery is tested and has passed in accordance with UN Manual of Tests and criteria, Part III, subsection 38.3

The good shall be complied with the requirements of section IA of Packing instruction 965 of 59th DGR Manual of IATA or special provision 188 of IMDG CODE (Amdt 38-16)

15.1 SHIPPING BY AIR:

i-G3N batteries exceeding 35kg in weight may not be shipped by air because they exceed the maximum weight limit for a Lithium battery that may be carried by a cargo airline carrier.

15.2 SHIPPING BY SEA:

IMDG proper shipping name: Lithium Ion Batteries Hazard Class: 9 UN Class: UN3480 Packaging group: II Watt-hour exceeds the standard, so it belongs to dangerous goods. The goods are packaged according to the special provision 188 of IMDG

Transport Fashion: By air (<35kg), by sea, by railway, by road