Lithium-Ion Battery Test Summary

a.) Model Name: **NINA-Mg**

b.) Product Manufacturer: **HEDBOX** Shenzhen R. Electronics Co. Ltd.
Address: Fuzhong Ind. Park, Fuyong Street, Shenzen, China
Telephone Number: +386-40-316-553
E-Mail: sales@hedbox.com
URL: www.hedbox.com

c.) Test Laboratory: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address: Room 101, 201, Building A, Juji Industrial Park, Yabianxueziwei Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Telephone Number: +(86) 0755-82591330
E-Mail: webmaster@lcs-cert.com
URL: http:// www.lcs-cert.com

d.) Identification Number: LCSA08154108SA

e.) Date of test report: 05 September 2024

f.) Description of product:
(i) Content: Lithium-Ion Rechargeable Battery Pack
(ii) Battery Pack Mass: 556.6 g
(iii) Nominal Voltage (V): 14.8V
Capacity (mAh/Wh): 6700mAh / 99Wh
(iv) Physical Desctription: Battery with outher case

g.) Test Result:

No.	Test Item	Test Result	Note	
T1	Altitude Simulation	**Passed**	First cycle fully charged 4 Batteries	After 25 cycle fully charged 4 Batteries
T2	Thermal Test	**Passed**		
T3	Vibration	**Passed**		
T4	Shock	**Passed**		
T5	External Short Circuit	**Passed**		
T6	Impact	**Passed**	First cycle 50% charged 5 cells	After 25 cycle fully charged 5 cells
T7	Overcharge	**Passed**	First cycle fully charged 4 Batteries	After 25 cycle fully charged 4 Batteries
T8	Forced Discharge	**Passed**	First cycle fully discharged 10 cells	After 25 cycle fully discharged 10 cells

h.) Assembled Battery Testing Requirements: N/A

i.) Reference Editions: UN Manual of Tests and Criteria,
ST/SG/AC.10/11 / Rev.7 / Amand.1 / Sub-Section 38.3

j.) Signature:

Zoran Komlenski
General Manager
Reaserch and Development Division

MATERIAL SAFETY DATA SHEET

Reference to ST/SG/AC.10/30/Rev.10 (GHS)

1. PRODUCT AND COMPANY IDENTIFICATION

- Product Idetification: Lithium Ion Rechargeable Battery Pack
- Product No. : **NINA-Mg**
- Company Name HEDBOX D.o.o.
- Address: Poslovna Cona A10, 4208 Sencur, Slovenia - Europe
- Telephone : +386 40 316 553
- E-mail address: sales@hedbox.com
- Emergency Phone Number: +386 40 333 613 (Products Division. Direct)

2. HAZARDS IDENTIFICATION

Preparation hazards and classification	Not dangerous with normal use. Do not dismantle, open or shred the Li-ion Battery Pack ingredients contained within or their ingredients products could be harmful.
Apperance, Color, and Odor	Solid object with no odor, no color.
Primary Route(s) of Exposure	These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact
Potential Health Effects:	**ACUTE (short term): see** Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns. **Inhalation:** Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation. **Ingestion:** Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. **Skin:** Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin. **Eye:** Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye. **CHRONIC (long term):** see Section 11 for additional toxicological data
Environmental effects :	Since a battery pack remains in the environment, do not throw out it into the environment.
Specific hazards:	If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride. Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Li-ion Battery Pack is a mixture.

Hazardous Ingredients (Chemical Name)	Concentration or concentration ranges (%)	CAS Number
Aluminum Foil	2-10	7429-90-5
Nickel compound (proprietary)	0-80	N/A
Manganese compound (proprietary)	0-15	N/A
Styrene-Butadiene-Rubber	<1	N/A
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Copper	2-10	7440-50-8
Carbon	10-30	7440-44-0
Electrolyte (proprietary)	10-20	N/A
Silicon oCompound (proprietary)	<2	N/A

Labeling according to EC directives.
No symbol and risk phrase are required.
Note: CAS number is Chemical Abstract Service Registry Number.
N/A=Not applicable

4. FIRST-AID MEASURES

Inhalation	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.
Skin contact	If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Eye contact	If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.
Ingestion	If ingestion of contents of an open battery occurs, never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2-8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility

5. FIRE-FIGHTING MEASURE

Flammable Properties	In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.
Suitable extinguishing Media	Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium, and fire foam.

Unsuitable extinguishing Media	Not available
Explosion Data	**Sensitivity to Mechanical Impact:** This may result in rupture in extreme cases **Sensitivity to Static Discharge:** Not Applicable
Specific Hazards arising from the chemical	Fires involving Li-ion Battery Pack are controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire
Protective Equipment & precautions for firefighters	As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.
NFPA	Health: 0 Flammability: 0 Instability: 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, protective equipment, and emergency procedures	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.
Environmental Precautions	Prevent material from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Methods and materials for cleaning up	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

7. HANDLING AND STORAGE

Handling

- Don’t handle Li-ion Battery Pack with metalwork.
- Do not open, dissemble, crush or burn battery.
- Ensure good ventilation/ exhaustion at the workplace.
- Information about protection against explosions and fires: Keep ignition sources away
- Do not connect the positive terminal to the negative terminal with electrical wire or chain.
- Avoid polarity reverse connection when installing the battery to an instrument.
- Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
- Do not damage or remove the battery case.
- Keep the battery away from heat and fire.
- Do not disassemble or reconstruct the battery; or solder the battery directly.
- Do not give a mechanical shock or deform.
- Do not use unauthorized charger or other charging method.
- Terminate charging when the charging process doesn’t end within specified time.
- In the case of charging, use only dedicated charger or charge according to the conditions specified by HEDBOX.

Storage

- If the Li-ion Battery Pack is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion Battery Pack periodically.
- Make the charge amount less than or equal to 50% then store at -20～40 degree C in a dry (humidity: 45～85%) place.
- Do not store Li-ion Battery Pack haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
- Keep out of reach of children.
- Do not expose Li-ion Battery Pack to heat or fire.
- Avoid storage in direct sunlight.
- Do not store together with oxidizing and acidic materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls	Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.
Personal Protective Equipment	**Respiratory Protection:** Not necessary under normal conditions. **Skin and body Protection:** Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery. **Hand protection:** Wear neoprene or natural rubber material gloves if handling an open or leaking battery. **Eye Protection:** Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.
Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the immediate work area.
Hygiene Measures	Have a safety shower and eye wash fountain readily available in the immediate work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Form: Prismatic
	Color: Black
	Odor: Odorless
Change in condition:	
pH, with indication of the concentration	Not applicable
Melting point/freezing point	Not available.
Boiling Point, initial boiling point and Boiling range:	Not available.
Flash Point	>520°C
Upper/lower flammability or explosive limits	Not available.
Vapor Pressure:	Not applicable
Vapor Density: (Air = 1)	Not applicable
Density/relative density	Not available.
Solubility in Water:	Insoluble
n-octanol/water partition coefficient	Not available.
Ignition Point:	>550°C
Decomposition temperature	Not available.
Odout threshold	Not available.
Evaporation rate	Not available.
Flammability (soil, gas)	Combustible
Viscosity	Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable under normal use.

- **Conditions to avoid:** Do not subject Li-ion Battery Pack to mechanical shock. Vibration encountered during transportation does not cause leakage, fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.
- **Materials to avoid:** Conductive materials, water, seawater, strong oxidizers and strongacids.
- **Hazardous decomposition products:** Acrid or harmful gas is emitted during fire.

For molding case

- **Thermal decomposition:** Decomposition begins at 380℃
- **Reactivity with water**: none
- **Self-reactivity**: none

Hazardous decomposition products:

- Smoldering or incomplete combustion leads to the formation of toxic gasmixture such as carbondioxide, carbon monoxide and traces ofaliphatic and aromatic hydrocarbons, aldehydes, acids, phenol andphenol derivatives.

Hazardous reaction:

- No hazardous reaction observed.

11. TOXICOLOGICAL INFORMATION

Irritation	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Sensitization	Not Available
Neurological Effects	Not Available
Teratogenicity	Not Available
Reproductive Toxicity	Not Available
Mutagenicity (Genetic Effects)	Not Available
Toxicologically Synergistic Materials	Not Available

12. ECOLOGICAL INFORMATION

General note:	Water hazard class 1(Self-assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Anticipated behavior of a chemical product in environment/possible environmental impace/ecotoxicity	Not Available
Mobility in soil	Not Available

13. DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal

Product (waste from residues)

- Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

Contaminated packaging

- Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cells contaminates, dispose as industrial wastes subject to special control..

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain.

This Battery Pack had passed the UN 38.3 test and is classified as non-dangerous goods and also complies with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods regulations, and applicable U.S. DOT regulations for the safe transport of Li-ion Battery Pack.

UN classification**: *Watt-hour rating is not more than 100Wh***

- **UN3480** "Lithium ion batteries"
  Class 9 "Dangerous Goods"
  Pack Instruction **PI 965 section IB**
  Cargo Aircraft Only (Limit per package 10kg)
  UN Specification packaging is required.
  Packaging must be test for 1.2m drop test
  or
- **UN3481** "Lithium ion batteries packed with equipment "
  Pack Instruction **PI 966 section II**
  UN Specification packaging is not required.
  Passanger Aircraft (Limit per package 5kg)
  Cargo Aircraft Only (Limit per package 5kg)
  UN Specification packaging is not required.

- **Maximum of 20 spare batteries in carry-on baggage only**.

Batteries capacity must be transport at a state of charge (SoC) not exceeding 30% of the their rated capacity.

Li-ion batteries treated as "Non-regulated goods" under the United Nations Recommendations on the Transport of Dangerous Goods, Special Provision 188, provided that packaging is strong and prevent the products from short-circuit.

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions (2021-2022 edition).
- The International Air transport Association (IATA) Dangerous Goods Regulations (65rd edition).
- The International Maritime Dangerous Goods (IMDG) Code (Amdt. 40-20).
- The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA
- The Office of Hazardous Materials Safety within the US Department of Transportations' (DOT) Research and Special Programs Administration (RSPA)

15. REGULATORY INFORMATION

Regulations specifically applicable to the product:

- Regulations specifically applicable to the product:
  US Department of Transportation 49 Code of Federal Regulations [USA]

16. OTHER INFORMATION

- The information contained in this Safety data sheet is based on the present sate of knowledge and current legislation.
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.
- HEDBOXmakes no warranty, expressed or implied regarding the accuracy of these data or the results tobe obtained from the use thereof. HEDBOXassumes no responsibility for injury from the use to the productdescribed herein.

Reference

- Dangerous Goods Regulations – 65th Edition Effective from 1 January 2024 International AirTransport Association (IATA)
- IMDG Code -2022 Edition: International Maritime Organization (IMO)
  The European Agreemant concerning the International Carriage of Dangerous Goods by Road
- 2023:The United Nations Economic Commission for Europe(UNECE)
- MSDS of raw materials prepared by the manufactures:

********** End of MSDS **********

Prepared and approved by:

Research and Development Division
HEDBOX Group