

MATERIAL SAFETY DATA SHEET

Issued and Revised Date: 09-Dec.,2019

1. Material and Company

Identification 1.1 Product Identification

Product Name: Lithium Ion Rechargeable battery

Model: LF12176 LI1103 LI11058 LI11068 LI11098 LI1120

Rate: 12.8V 176Ah 2252.8Wh 11.1V 3Ah 33.3Wh 11.1V 5.8Ah 64.38Wh 11.1V 6.8Ah 75.48Wh 11.1V 9.8Ah 108.78Wh 11.1V 20Ah 222Wh

1.2 Manufacturer:

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1.3 Valid Date:2019.12.9-2019.12.31

2.Substance Identification

Chemical name	CSA-NO	EC#	Quantity
Ferrous Phosphate Lithium	1536-14-7	--	28-32%
Organic Sovents	---	--	10-12%
Lithium Hexafluorophosphate	21324-40-3	244-334-7	2.5-3%
PVDF	24937-79-9	200-867-7	1.0-1.5%
Copper	7440-50-8	231-159-6	8-10%
Aluminum Foil	7429-90-5	231-072-3	3-5%
Graphite Foil	7782-42-5	231-955-3	12-14%
Shell	--	--	15-20%

3.Hazards Identification:

Route(s) of Entry: There is no hazard when the measures for handling and storage are followed.

Signs and Symptoms of Exposure: In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

OSHA Hazard Communication: This material is not considered hazardous by the OSHA Hazard Communication Standard 29 CFR 1910.1200.

Carcinogenicity (NTP): Not listed

Carcinogenicity (IARC): Not listed

Carcinogenicity (OSHA): Not listed

Special hazards for human health and environment

There is no hazard when the measures for handling and storage are followed. In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

4. First Aid Measures

The following first aid measures are required only in case of exposure to interior battery components after

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damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

After Ingestion: Drink plenty of water. Call a physician immediately.

After Inhalation: Ensure of fresh air. Consult a physician.

After Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes and seek medical treatment by eye specialist.

After Skin contact: In case of contact with skin wash off immediately with plenty of water. Consult a physician.

5. Fire Fighting Measures

Suitable Extinguishing Media: Cold water and dry powder in large amount are applicable.

Special hazard arising from the chemical: May form hydrofluoric acid if electrolyte comes into contact with water. In case of fire, the formation of the following flue gases cannot be excluded. Hydrogen fluoride(HF), Carbon monoxide and carbon dioxide.

Protective equipment and precautions for Firefighter: Wear self-contained breathing apparatus and protective suit.

Additional information: if possible, remove cell(s) from fire fighting area, If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

6. Accidental Release Measures

Personal precautions: Use personal protective clothing. Avoid contact with skin, eyes and clothing. Avoid breathing fume and gas.

Environmental precautions: Do not discharge into the drains/surface waters/groundwater. Methods for cleaning up/taking up. Take up mechanically and send for disposal.

7. Handling And

Storage Handling

Advice on safe handling

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.

Advice on protection against fire and explosion.

Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage rooms and vessels

Storage at room temperature (approx.20°C); Keep in closed original container.

8. Exposure Controls/Personal Protection Exposure limit values Exposure limits

Additional advice on limit values: During normal charging and discharge there is no release of product.

Occupational exposure controls: No specific precautions necessary.

Protective and hygiene measures: When using do not eat, drink or smoke. Wash hands before breaks and after work.

Respiratory protection: No specific precautions necessary.

Hand protection: No specific precautions necessary.

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt oxide	R22;R43; R50/53	S24;S37;S60;S61	Xn(Harmful) N (Dangerous for the environment)	0.1 mg/m3 (TWA)
Manganese (VI) oxide	R20/22	S25	Xn(Harmful)	Airborne Exposure Limits: - OSHA Permissible Exposure Limit (PEL): 5 mg/m3 Ceiling for manganese compounds as Mn - ACGIH Threshold Limit Value (TLV): 0.2 mg/m3 (TWA) for manganese, elemental and inorganic compounds as Mn
Nickel oxide	R43,R49, R53	S45,S53,S61	T(Toxic)	Airborne Exposure Limits: For Nickel, Metal and Insoluble Compounds, as Ni: - OSHA Permissible Exposure Limits (PEL) - 1 mg/m3 (TWA). For Nickel, Elemental / Metal: - ACGIH Threshold Limit Value (TLV) - 1.5 mg/m3 (TWA), A5 - Not suspected as a human carcinogen. For Nickel, Insoluble Compounds, as Ni: - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m3 (TWA), A1 - Confirmed human carcinogen
Carbon	R36/37/38, R36/37 R20, R10	S22;S24/25	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	Airborne Exposure Limits: - OSHA Permissible Exposure Limits (PELs): activated carbon (graphite, synthetic): Total particulate = 15 mg/m3
Aluminium foil	R17,R15, R36/38, R10,R67, R65,R62, R51/53, R48/20, R38,R11,	S7/8,S43,S26,S62 ,S61, S36/37, S33,S29,S16,S9	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	Airborne Exposure Limits: - OSHA Permissible Exposure Limit (PEL): 15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA) repairable fraction for Aluminum metal as Al - ACGIH Threshold Limit Value (TLV): 10 mg/m3 (TWA) Aluminum metal dusts
Copper foil	R11 R36 R37 R38	S5,S26,S16,S61, S36/37	F(Highly Flammable) N(Dangerous for the environment) Xn(Harmful) Xi(Irritant)	Copper Dust and Mists, as Cu: - OSHA Permissible Exposure Limit (PEL) - 1 mg/m3 (TWA) - ACGIH Threshold Limit Value (TLV) - 1 mg/m3 (TWA) Copper Fume: - OSHA Permissible Exposure Limit (PEL) - 0.1 mg/m3 (TWA) - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m3 (TWA)
Polyvinylidene fluoride (PVdF)		S22;S24/25		

9. Physical And Chemical**Properties Appearance**

Form:Solid

Color:Various

Odor:Odourless

Important health, safety and environmental information

Test Method

pHValue: n.a.

Flash Point: n.a.

Lower explosion limits: n.a.

Vapour pressure: n.a.

Density: n.a.

Water solubility: n.a.

Ignition temperature: n.a.

10. Stability and Reactivate**USA,EU** Stability: stableConditions to Avoid: Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.Materials to Avoid: No materials to be especially mentioned.Hazardous decomposition products: In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.Possibility of Hazardous Reactions: Will not occurAdditional information: No decomposition if stored and applied as directed.**11. Toxicological Information**

This product does not elicit toxicological properties during routine handling and use.

Sensitization: no	Teratogenicity: no	Reproductive toxicity: no	Acute toxicity:no
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This product does not contain any kinds of the following substances and halogen-type flame retardants including Chlorine and Bromide type harmful flame retardants which are listed in Appendix of TCO documents and relevant international ECO requirements:

Polybromated Biphenyls	(PBB)
Polybromated Biphenyl Ethers	(PBBE)
Polybromated Biphenyl Oxides	(PBBO)
Polybromated Diphenylethers	(PBDE)
Polybromated Biphenyl	(PCB)
Polybromated Diphenylethers	(PCDE)
Tetrabromphenol A	(TBBP A)

Asbestos, Antimonytrioxide, Dioxine

None of the following substances will be exposed, leaked, or emitted during transportation, storage or any operation and any temperature condition:

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Chlorinated Fluorohydro carbon (FCKW)

Acrylnitrile, Styrol, Phenol, Benzol

Mercury of greater than 0.0001wt% for alkaline battery Mercury of greater than 0.0005wt% for other battery lithium content of greater than 0.5g/cell, 1.5g/battery Cadmium, Lead, and other harmful heavy metal.

This product does not contain mercury, cadmium and lithium-metal.

Mercury content: N/A

Lithium-metal: N/A

Cadmium content: N/A

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

12. ECOLOGICAL INFORMATION

Some materials within the cell are bioaccumulative, under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

13. DISPOSAL

CONSIDERATIONS Waste

treatment methods Recommendation:

Consult state, local or national regulations to ensure proper disposal.

Uncleaned packaging:

Dispose of according to all federal, state, and local regulations.

14. Transport Information

According to the UN3480 packing instruction 965-967 of IATA DGR 60th edition for transportation, or the special provision 189 of IMDG(37-14) or the << Recommendations on the transport of dangerous goods-model regulations>>(18th.)

More information concerning shipping, testing, marking and packaging can be obtained from label master at <http://www.labelmaster.com>.

Separate lithium-ion batteries when shipping to prevent short-circuiting, they should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

Transport hazard class(es):9

Transport fashion: by air, by sea, by railway, by road.

15. Other Information

The information is not effective to all the batteries manufactured by Head , this information comes from reliable sources, but no warranty is made to the completeness and accuracy of information contained. Head doesn't assume responsibility for any damage or loss because of misuse of batteries.