

Safety Data Sheet (SDS)

Revision date: Feb 05, 2021

SECTION 1: Identification of the substance / mixture and the company / undertaking

1.1 Product Identifier

Lithium-ion cells and battery packs, LiFePO₄

Product brand: Discover

Product Model	Marketing Name
12-48-6650	12-48-6650
42-48-6650	42-48-6650
12-36-6700	12-36-6700
14-24-2800	14-24-2800
44-24-2800	44-24-2800
15-24-1000	15-24-1000
15-36-1000	15-36-1000
900-0041	14-48-3000 / 44-48-3000
900-0042	14-36-3000
900-0043	14-24-3000
900-0044	14-12-3000
590-0080	n/a
590-0086	n/a
590-0090	n/a
590-0097	n/a
IFR 26650P	n/a
IFR 32650	n/a

Product Model	Marketing Name
900-0046	DLB-G24-12V
900-0047	DLB-G24-24V
900-0048	DLB-G24-36V
900-0049	DLB-GC12-12V
900-0050	DLB-GC12-24V
900-0051	DLP-GC2-12V
900-0052	DLP-GC2-24V
900-0053	DLP-GC2-36V
900-0054	DLP-GC2-48V
GSP34135214F	n/a
2770180E_30Ah_LFP	n/a

Other means of identification:

Discover Energy Advanced Energy Systems (AES)
Discover LITHIUM BLUE Premium Series Lithium Battery
Discover LITHIUM PRO Professional Series Lithium Battery
Discover Energy lithium / lithium ion
Discover Energy cell / module / battery / pack / system
Battery module / battery / pack / system

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: Electrochemical energy storage - industrial use
Uses advised against: Not applicable

1.3 Details of the supplier of the safety data sheet

Company: Discover Energy Corp.
Address: #4 Crestwood Place, Richmond, BC V6V 2E9 Canada
Telephone: +1 (778) 776 3288 Website: www.discoverbattery.com

1.4 Emergency telephone number

Emergency phone: 1-800-535-5053 (Account# 84774)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP]

This product is considered as a manufactured article, and not classified as hazardous according to EC 1272/2008.

Classification according to Directive 67/548/EEC

This product is not classified as hazardous according to Directive 67/548/EEC.

Classification according to Directive 1999/45/EC

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2 Label elements

Symbols / Pictograms	No pictogram is used
Signal word	No signal word is used
Hazard statements	Not classified
Precautionary statements	Not classified

2.3 Other hazards

Primary route(s) to exposure

This product is safe with normal use. Exposure to the ingredients contained within and/or their combustion products could be harmful. Risk of exposure occurs only if the battery is mechanically, thermally, or electrically abused and the enclosure is ruptured. If this occurs, exposure to electrolyte can occur by inhalation, ingestion, eye contact, and skin contact. The battery should not be opened or burned.

Inhalation

Inhalation of material from a sealed battery/cell is not an expected route of exposure. Vapors or mists from a ruptured battery/cell may cause respiratory irritation.

Ingestion

Swallowing of material from a sealed battery/cell is not an expected route of exposure. Swallowing the contents of a ruptured cell may cause serious chemical burns of the mouth, esophagus, and gastrointestinal tract.

Skin

Contact between the skin and battery will not cause harm. Contact with the contents of a ruptured cell/battery can cause severe irritation or burns to the skin.

Eye

Contact between the eye and battery will not cause harm. Contact with the contents of a ruptured cell/battery can cause severe irritation or burns to the eye.

SECTION 3: Composition/information on ingredients

3.1 Substances

Product is a manufactured article. Exposure to interior of article is not expected with normal use.

3.2 Mixture

Product is a manufactured article. Exposure to hazardous ingredients is not expected with normal use.

Composition for Li-ion Cell (Model: IFR32650) used inside product.

Chemical Name	EC No	CAS No.	Weight (%)	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Lithium Iron Phosphate	---	15365-14-7	27.04	Not classified
Graphite (C)	231-955-3	7782-42-5	12.78	Carc. 1A, H350 Carc. 2, H351 STOT RE 1, H372 Comb. Dust
Aluminium (Al)	231-072-3	7429-90-5	6.44	Flam. Sol. 1 (H228) Water-react. 2 (H261)
Copper (Cu)	231-159-6	7440-50-8	9.22	Acute Tox. 4 (Oral), H302 Comb. Dust
Iron	231-096-4	7439-89-6	23.52	Comb. Dust
Nickel (Ni)	231-111-4	7440-02-0	1.18	Skin Sens. 1; Carc. 2; STOT RE 1; Aquatic Chronic 3; H317, H351, H372, H412
Polyethylene (C ₂ H ₄) _n	---	9002-88-4	4.37	Comb. Dust
Lithium, Hexafluorophosphate (LiPF ₆)	244-334-7	21324-40-3	2.01	Acute Tox. 3; Skin Corr. 1A; STOT RE 1; H301, H314, H372
Organic Solvent	---	---	13.44	Not classified

Composition for Li-ion Cell (Model: IFR26650P) used inside product.

Chemical Name	EC No	CAS No.	Weight (%)	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Lithium Iron Phosphate	---	15365-14-7	27.04	Not classified
Graphite (C)	231-955-3	7782-42-5	12.78	Carc. 1A, H350 Carc. 2, H351 STOT RE 1, H372 Comb. Dust
Aluminium (Al)	231-072-3	7429-90-5	6.44	Flam. Sol. 1 (H228) Water-react. 2 (H261)
Copper (Cu)	231-159-6	7440-50-8	9.22	Acute Tox. 4 (Oral), H302 Comb. Dust
Iron	231-096-4	7439-89-6	23.52	Comb. Dust
Polyethylene (C ₂ H ₄) _n	---	9002-88-4	4.37	Comb. Dust
Organic Solvent	---	---	13.44	Not classified

Composition for Li-ion Cell (Model: 2770180E_30Ah_LFP) used inside product.

Chemical Name	EC No	CAS No.	Weight (%)	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Lithium Iron Phosphate	---	15365-14-7	28-32	Not classified
Graphite (C)	231-955-3	7782-42-5	13-17	Carc. 1A, H350 Carc. 2, H351 STOT RE 1, H372 Comb. Dust
Aluminium (Al)	231-072-3	7429-90-5	15-19	Flam. Sol. 1 (H228) Water-react. 2 (H261)
Copper (Cu)	231-159-6	7440-50-8	16-20	Acute Tox. 4 (Oral), H302 Comb. Dust
Iron	---	---	---	---
Polyethylene (C ₂ H ₄) _n)	---	---	---	---
Organic Solvent	---	---	15-18	Not classified

Composition for Li-ion Cell (Model: GSP34135214F) used inside product.

Chemical Name	EC No	CAS No.	Weight (%)	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Lithium Iron Phosphate	---	15365-14-7	23	Not classified
Graphite (C)	231-955-3	7782-42-5	11.5	Carc. 1A, H350 Carc. 2, H351 STOT RE 1, H372 Comb. Dust
Aluminium (Al)	231-072-3	7429-90-5	5.5	Flam. Sol. 1 (H228) Water-react. 2 (H261)
Copper (Cu)	231-159-6	7440-50-8	6.7	Acute Tox. 4 (Oral), H302 Comb. Dust
Iron	---	---	---	---
Polyethylene (C ₂ H ₄) _n)	---	9002-88-4	2	Comb. Dust
Organic Solvent	---	---	13.2	Not classified

Weight of metallic lithium per cell: 0g. There is no metallic lithium in the lithium polymer battery.

These chemicals are contained in a sealed can, inside a sealed container. Risk of exposure only occurs if battery is mechanically, thermally or electrically abused.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

In all cases of doubt, or when symptoms persist, seek medical attention. Contact of electrolyte and extruded lithium with skin and eyes should be avoided.

Eyes

Not an expected route of exposure. Following eye contact, cautiously rinse affected eye with clean lukewarm water for at least 30 minutes. Remove contact lenses, if present and easy to do. If eye irritation persists, seek medical attention.

Skin

Not expected to present as skin hazard under anticipated conditions of normal use. Following skin contact, immediately remove contaminated clothing and wash skin with copious amounts of soap and water. If irritation or pain persists, seek medical attention.

Ingestion

Following ingestion, rinse out mouth with water. DO NOT INDUCE VOMITING. Seek immediate medical attention.

Inhalation

Not an expected route of exposure. If inhaled electrolyte, remove victim to fresh air and remove source of contamination from area. Keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Acute effects

Direct contact of internal electrolyte gel with eyes may cause severe burns or blindness

Direct contact of internal electrolyte gel with the skin may cause skin irritation or damaging burns.

Vapor or mist can irritate the eyes, mucous membranes and respiratory tract. Exposure can cause nausea, dizziness and headache.

Chronic/delayed effects

Overexposure to the internal electrolyte gel may cause reproductive disorder(s) based on tests with laboratory animals. Target organs affected could be kidneys, central nervous system, eyes, and male reproductive system. Overexposure may cause cancer. Target organs are the brain, intestine, mammary gland, haematopoietic system and kidneys.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, dry chemical powder, carbon dioxide (CO₂) and foam are most effective to extinguish a battery fire.

For small fires use only sand, dry chemical powder, CO₂ or regular foam. Continuously apply media until fire is extinguished.

For large fires, use copious quantities of water spray. Continuously apply media until fire is extinguished. Large fires should only be extinguished by trained fire fighters.

Unsuitable extinguishing media

Do not use small quantities of water. If water spray is used, it must be continually applied until fire is extinguished.

5.2 Special hazards arising from the substance or mixture

Battery may vent when subjected to excessive heat-exposing, fire or over voltage condition. Risk of explosion by fire is anticipated if batteries are disposed of in fire. Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

The interaction of water or water vapour with electrolyte may result in the generation of hydrogen and hydrogen fluoride (HF) gas.

Contact with battery electrolyte may be irritating to the skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

Lithium-ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures, when damaged or abused.

Burning cells may ignite other cells or objects within close proximity.

5.3 Advice for firefighters

Large lithium-ion battery fires should only be extinguished by properly equipped fire fighters with training specific to lithium ion battery fires.

Wear NIOSH/MSHA/EN469-approved self-contained breathing apparatus (SCBA) and protective clothing when fighting chemical fires.

SECTION 6: Accidental release measures

The material contained within the batteries is only released if the battery is mechanically, thermally, or electrically abused and the enclosure is ruptured.

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas
Ensure adequate ventilation, especially in confined areas
Remove all sources of ignition
Avoid contact with skin, eyes and inhalation of vapours
User personal protection recommended in Section 8.3

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so
Do not allow electrolyte to flow into any sewer, on the ground or into any body of water

6.3 Methods and material for containment and cleaning up

Add neutralizer/absorbent, e.g. sand or vermiculite, to spill area. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

6.4 Reference to other sections

See Section 7 for more information

See Section 8 for more information

See Section 13 for more information

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Do not open, disassemble, crush, puncture, or burn product. If battery case is broken, avoid contact with internal components. Do not handle near heat, sparks, or open flames.

Remove metallic accessories, rings and other jewelry when handling live batteries.

Protect containers from physical damage to avoid leaks and spills.

Place cardboard between layers of stacked batteries to avoid damage and short circuits,

Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.

7.2 Conditions for safe storage, including any incompatibilities

Insulate positive and negative terminals to avoid short circuit. Avoid mechanical or electrical abuse.

Store product in cool, dry and ventilated area, which is subjected to little temperature changes. Storage at high temperatures, or exposure to direct sunlight for long periods, should be avoided. The recommended storage temperature is -20°C–45°C, not to exceed 60°C. Elevated temperatures can result in shortened battery life.

Keep out of reach of children.

Store in accordance with local regulations.

7.3 Specific end use(s)

Apart from the uses mentioned in SECTION 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls / personal protection

8.1 Control parameters

Occupational exposure limits

Exposures to hazardous substances are not expected when product is used for its intended purpose.

See Section 8.2 for ingredients with limit values that require monitoring at the workplace if a battery case has been compromised or damaged.

Biological limit values

Exposures to hazardous substances are not expected when product is used for its intended purpose.

Exposure limits at intended use

Exposures to hazardous substances are not expected when product is used for its intended purpose.

Derived No Effect Level (DNEL) / Predicted No Effect Concentration (PNEC) values

Not applicable.

Risk management measures according to used control banding approach

Not applicable.

8.2 Ingredients with limit values

Chemical Name	Graphite (CAS #: 7782-42-5)	Copper (CAS #: 7440-50-8)	Aluminium (CAS #: 7429-90-5)	Lithium, Hexa-fluorophosphate (LiPF₆) (CAS #: 21324-40-3)
Region				
Australia	3 mg/m ³	1 mg/m ³ 0.2 mg/m ³	10 mg/m ³ 5mg/m ³	2.5 mg/m ³
Austria	STEL: 10 mg/m ³ TWA: 5 mg/m ³	STEL: 4mg/m ³ STEL: 0.4 mg/m ³ TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	STEL 20 mg/m ³ TWA: 10 mg/m ³	---
Belgium	---	---	---	---
Denmark	TWA: 2.5 mg/m ³	TWA: 1.0 mg/m ³ TWA: 0.1 mg/m ³	TWA: 5 mg/m ³ TWA: 2 mg/m ³	TWA: 2.5 mg/m ³
European Union	---	---	---	---
France	---	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	---
Finland	---	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	TWA: 1.5 mg/m ³	---
Germany	---	TWA: 0.01 mg/m ³ Ceiling/peak: 0.02 mg/m ³ Ceiling/peak: 0.2 mg/m ³	TWA: 4 mg/m ³ TWA: 1.5 mg/m ³	TWA: 1 mg/m ³ Skin
Italy	---	---	---	---
Latvia	---	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 2 mg/m ³	---
Netherlands	---	TWA: 0.1 mg/m ³	---	---
Norway	---	TWA: 0.1 mg/m ³ TWA: 1 mg/m ³ STEL: 0.1 mg/m ³ STEL: 1 mg/m ³	TWA: 5 mg/m ³ STEL: 5 mg/m ³	---
Poland	---	---	TWA: 2.5 mg/m ³ TWA: 1.2 mg/m ³	---
Portugal	---	---	TWA: 10 mg/m ³ TWA: 5 mg/m ³	---
Spain	---	---	TWA: 10 mg/m ³ TWA: 5 mg/m ³	---
Switzerland	---	---	TWA: 3 mg/m ³	---
United Kingdom	---	---	STEL: 30 mg/m ³ STEL: 12 mg/m ³ TWA: 10 mg/m ³ TWA: 4 mg/m ³	---
Other:				
ACGIH TLV	TWA: 2.0 mg/m ³ Respirable fraction all forms except graphite fibers	TWA: 0.2 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist	TWA: 1mg/m ³ respirable fraction	TWA: 2.5 mg/m ³ F

Chemical Name Region	Graphite (CAS #: 7782-42-5)	Copper (CAS #: 7440-50-8)	Aluminium (CAS #: 7429-90-5)	Lithium, Hexa-fluorophosphate (LiPF ₆) (CAS #: 21324-40-3)
OSHA PEL	---	---	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 5 mg/m ³ Al	---
NIOSH IDLH	---	IDLH: 100 mg/m ³ dust, fume and mist IDLH: 100 mg/m ³ Cu dust and mist TWA: 1 mg/m ³ dust and mist TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist	TWA: 10 mg/m ³ total dust TWA: 5 mg/m ³ respirable dust TWA: 5 mg/m ³ Al	---

8.3 Exposure controls

Appropriate engineering controls

Not necessary under normal conditions. Broken or leaking batteries should be handled in accordance with good industrial hygiene and safety practices. Wash hands before work breaks and at the end of workday. Do not eat, drink or smoke while handling leaking batteries.

Personal protective equipment

Eye/face protection: Not necessary under conditions of normal use. In case of battery rupture or leakage, wear safety goggles or side shields when handling.

Skin protection: Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and nitrile, neoprene, or natural rubber gloves when handling an open or leaking battery. Inspect gloves prior to use. Change disposable gloves within 30 minutes of obvious contamination by electrolyte. Remove dirty gloves by appropriate technique. Do not touch outer surface of glove.

Respiratory protection: Not necessary under conditions of normal use. In case of battery venting or rupture, inside an enclosed space, use NIOSH approved or equivalent self-contained breathing apparatus.

8.4 Environmental exposure controls

Comply with the handling and storage guidelines in Section 7. Do not allow any spilled electrolyte from damaged product in any sewer, on the ground, or into any body of water.

SECTION 9: Physical and Chemical Properties

9.1 Information on the basic physical and chemical properties

Appearance

Solid. Battery system, battery module, or cell.

Color	Grey
Odor	Odourless
Odor threshold	Not applicable
pH	Not applicable
Melting point / freezing point	Not applicable
Initial boiling point / boiling range	Not applicable
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability	Not applicable
Flammability limit in air	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Density	Not applicable
Specific gravity	Not available
Solubility in water	Insoluble
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	Not applicable
Viscosity	Not applicable
Explosive properties	Not applicable
Oxidizing properties	Not applicable

9.2 Other information

Electrical specifications

Product Model	Nominal Voltage	Electric Capacity	Electric Energy	Marketing Name
12-48-6650	51.2 V	130 AH	6656 WH	12-48-6650
42-48-6650	51.2 V	130 AH	6656 WH	42-48-6650
14-24-2800	25.6 V	110 AH	2816 WH	14-24-2800
44-24-2800	25.6 V	110 AH	2816 WH	44-24-2800
15-24-1000	25.6 V	40 AH	1024 WH	15-24-1000
12-36-6700	38.4 V	175 AH	6720 WH	12-36-6700
15-36-1000	38.4 V	25 AH	960 WH	15-36-1000
IFR32650	3.2 V	5 AH	16 WH	n/a
900-0044	12.8 V	228 AH	2918 WH	14-12-3000
900-0043	25.6 V	114 AH	2918 WH	14-24-3000
900-0042	38.4 V	76 Ah	2918 WH	14-36-3000
900-0041	51.2 V	57 AH	2918 WH	14-48-3000 / 44-48-3000
590-0080	51.2 V	57 AH	2918 WH	n/a
590-0086	38.4 V	76 AH	2918 WH	n/a
590-0090	25.6 V	114 Ah	2918 WH	n/a
590-0097	12.8 V	228 AH	2918 WH	n/a
IFR26650P	3.2 V	3.8AH	12 WH	n/a

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage and handling conditions (see Section 7, Handling and storage)

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.

If a battery is severely heated by a surrounding fire, acrid or harmful fumes may be emitted.

If leaked, do not allow contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

10.4 Conditions to avoid

Avoid mechanical or electrical abuse, including: external short circuit of battery, deformation by crush, direct sunlight, high humidity, temperatures exceeding 60°C, puncture, sources of ignition, or installation with incorrect polarity.

10.5 Incompatible materials

Strong bases, combustible organic materials, reducing agents, strong oxidizers, and sea water or other electrically conductive liquids.

10.6 Hazardous decomposition products

A compromised battery may emit irritating or toxic fumes and gases, including metallic oxide, hydrogen fluoride, carbon monoxide, and carbon monoxide.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute Toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Copper (CAS #: 7440-50-8)	> 2500 mg/kg bw (rat)	> 2000 mg/kg bw (rat)	= 1.03 mg/L/4 h (rat)
Aluminium (CAS #: 7429-90-5)	> 15900 mg/kg bw(rat)	---	> 0.888 mg/L/4 h (rat)
Ferrum (CAS # 7439-89-6)	> 7500 mg/kg bw (rat)	---	---

Skin corrosion/irritation

Non-irritating to the skin under normal conditions

Serious eye damage/irritation

No eye irritation under normal conditions

Respiratory or skin sensitization

No information available.

Germ cell mutagenicity

No information available.

Carcinogenicity

Risk of exposure occurs only if the battery enclosure is compromised.

Reproductive toxicity

Risk of exposure occurs only if the battery enclosure is compromised.

STOT-single exposure

No information available.

STOT-repeated exposure

No information available.

Aspiration hazard

No information available.

SECTION 12: Ecological information

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

12.1 Toxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Copper (CAS #: 7440-50-8)	0.031 – 0.054 mg/L/96h Pseudokirchneriella subcapitata static 0.0426 – 0.0535 mg/L/72h Pseudokirchneriella subcapitata static	1.25: 96h Lepomis macrochirus mg/L LC50 static 0.3: 96h Cyprinus carpio mg/L LC50 semi-static 0.8: 96h Cyprinus carpio mg/L LG50 Static 0.112: 96 h Poecilia reticulata mg/L LC50 Flow-through 0.0068 – 0.0156: 96 h Pimephales promelas mg/L LC50 0.3: 96h Pimephales promelas mg/L LC50 static 0.2: 96h Pimephales promelas mg/L LC50 flow-through 0.052: 96h Orcorhynchus mykiss mg/L LC50 flow- through	---
Aluminium (CAS #: 7429-90-5)	---	> 50 mg/L/96h	---

12.2 Persistence and degradability

Not readily biodegradable.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Other adverse effects

Batteries and cells released in the environment will slowly degrade and may release toxic or harmful substances. Batteries should be disposed or recycled according to local regulations.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recycling is encouraged. Do not throw out a used battery or cell in the landfill. Electrolyte should not be dumped into any sewers, on the ground, or into any body of water. Recycle through a qualified recycling company.

Canada Dispose of in accordance with local, state and federal laws and regulations.

Europe Dispose of in accordance with relevant EC Directives and national, regional, and local environmental control regulations. For disposal within the EC, the appropriate code according to the European List of Wastes (LoW) should be used.

USA Dispose of in accordance with local, state and federal laws and regulations.

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics is the responsibility of the end user. Store material for disposal as indicated in Section 7.

SECTION 14: Transport information

All Discover AES battery models (and their internal cells) have independently passed testing required by Section 38.3 of the UN Manual of Tests and Criteria.

14.1 UN number

Air transport (ICAO/IATA)	UN3480 (only for 15-24-1000, 15-36-1000, IFR32650, IFR26650P)
Sea transport (IMDG)	UN3480
Inland waterway transport (ADN)	UN3480
Land transport (ADR/RID)	UN3480

14.2 Proper shipping name

Air transport (ICAO/IATA)	Lithium Ion Batteries (only for 15-24-1000, 15-36-1000, IFR32650, IFR26650P)
Sea transport (IMDG)	Lithium Ion Batteries
Inland waterway transport (ADN)	Lithium Ion Batteries
Land transport (ADR/RID)	Lithium Ion Batteries

14.3 Hazard Class

Air transport (ICAO/IATA)	9 (only for 15-24-1000, 15-36-1000, IFR32650, IFR26650P)
Sea transport (IMDG)	9
Inland waterway transport (ADN)	9
Land transport (ADR/RID)	9

14.4 Packing Group

Air transport (ICAO/IATA)	II (only for 15-24-1000, 15-36-1000, IFR32650, IFR26650P)
Sea transport (IMDG)	II
Inland waterway transport (ADN)	II
Land transport (ADR/RID)	II

14.5 Environmental Hazards

Dangerous goods

14.6 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Worldwide air transportation:

The goods are packaged according to Section 1A of PACKING INSTRUCTION 965 of the 2016 IATA Dangerous Goods. Lithium-ion batteries may be air transported on CARGO AIRCRAFT ONLY and are forbidden in passenger aircraft.

Worldwide sea transportation:

The goods are packaged according to the special provision 188 of IMDG. IMO-IMDG Code [P903]

14.7 Labeling

Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium-ion batteries which are assigned Class 9. Refer to relevant transportation documents. Lithium and lithium-ion cells and batteries are regulated in the USA in accordance with Part 49 Regulations of the Code of Federal Regulations, (49 CFR Sections 105-180) of the U.S. Hazardous Materials Regulations.

Lithium-ion batteries, under UN3480, PI 965, Section 1A, must be declared as CARGO AIRCRAFT ONLY (CAO) if shipped by air.



SECTION 15:Regulatory information

15.1 Safety, health, and environmental regulations/legislation specific for the substance or mixture

Canada

This is not a controlled product under WHMIS. This product meets the definition of a “manufactured article” and is not subject to the regulations of the Hazardous Products Act.

All ingredients in the product are listed, as required, on the DSL/NDSL.

This product does not contain any NPRI Substances.

Europe

Under normal use, this product is not classified as hazardous according to:

Directive 1999/45/EC

None

S2: Keep out of the reach of children.

This product is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA hazard communication standard requirement.

All ingredients in the product are listed on the TSCA inventory.

None

This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

This material Safety Data Sheet (SDS) complies with the requirements of Regulation (EC) No. 1907/2006.

Clarification of Product Names and Models.

Korean Existing and Evaluated Chemical Substances

NPRI	National Pollutant Release Inventory
STEL	Short Term Exposure Limit
TSCA	United States Toxic Substances Control Act Section 8(b) Inventory
STOT RE	Specific Target Organ Toxicity – repeated exposure
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System

Full text of H-Statements referred to under Section 3

H228	Flammable solid
H261	Contact with water releases flammable gases
H301	Toxic if swallowed
H314	Causes severe skin burns and eye damage
H317	May cause an allergic reaction
H351	Suspected of causing cancer
H372	Causes damage to organs through prolonged or repeated exposure if inhaled
H412	Harmful to aquatic life with long lasting effects

16.3 Manufacturer disclaimer

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, DISCOVER ENERGY BATTERY MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES. ALTHOUGH REASONABLE PRECAUTIONS HAVE BEEN TAKEN IN THE PREPARATION OF THE DATA CONTAINED HEREIN, IT IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THIS SAFETY DATA SHEET PROVIDES GUIDELINES FOR THE SAFE HANDLING AND USE OF THIS PRODUCT; IT DOES NOT AND CANNOT ADVISE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.

1. Product and Company Identification

Product Code: L-0209211
Product Name: Environ HP Encapsulated Spotter
Company Name: Hruby Oribital Systems
3275 Corporate View
Vista, CA 92081
Phone Number: (760)936-8054
Emergency Contact: Infotrac
Domestic (800)535-5053
Internat'l (352)323-3500
Recommended Use: Spotter
Intended Use: For sale to, use and storage by service persons only.

2. Hazards Identification

Acute Toxicity: Oral, Category 4
Skin Corrosion/Irritation, Category 2
Serious Eye Damage/Eye Irritation, Category 2A



GHS Signal Word: **Warning**
GHS Hazard Phrases: H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Can cause serious eye irritation.
GHS Precaution Phrases: P270 - Do not eat, drink or smoke when using this product.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P362+364 - Take off contaminated clothing and wash it before reuse.
P102 - Keep out of reach of children.
GHS Response Phrases: P301+310 - If swallowed: Immediately call a Poison Center or doctor. P330 - Rinse mouth.
P302+352 - If on skin (or in hair): Wash with plenty of soap and water.
P305+351+338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 - Get medical attention/advice if you feel unwell.
GHS Storage and Disposal Phrases: P411+235 - Store in cool dry place at room temperature away from direct sunlight. P501 - Dispose of contents and container according to the local, city, state and federal regulations.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Skin Contact: May cause skin irritation.
Eye Contact: Causes severe eye irritation.
Ingestion: Harmful if swallowed.
Skin Absorption: May be harmful if absorbed through the skin.

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3. Composition/Information on Ingredients

CAS #	Hazardous Components (Chemical Name)	Concentration	
38714-47-5	Zinc(2+), tetraammine-, (T-4)-, carbonate (1:1)	2.0 -10.0 %	
7722-84-1	Hydrogen peroxide	2.0 -5.0 %	
68515-73-1	D-Glucopyranose, oligomeric, decyl octyl glycosides	2.0 -5.0 %	
110615-47-9	D-Glucopyranose, oligomeric, C10-16-alkyl glycosides	2.0 -5.0 %	
144538-83-0	Aspartic acid, N-(1,2-dicarboxyethyl)-, tetrasodium salt	0.5 -1.0 %	
77-92-9	Citric acid	0.5 -1.0 %	
55965-84-9	mixture of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H -isothiazol-3-	0.1 -0.2 %	
7732-18-5	Water	72.8 -90.9 %	

4. First Aid Measures

Emergency and First Aid Procedures:

In Case of Inhalation:	If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.
In Case of Skin Contact:	In case of contact, immediately wash skin with soap and copious amounts of water.
In Case of Eye Contact:	In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.
In Case of Ingestion:	If swallowed, wash out mouth with water provided person is conscious. Call a physician.
Signs and Symptoms Of Exposure:	To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

5. Fire Fighting Measures

Flash Pt:	NE	Method Used:	Estimate
Explosive Limits:	LEL: N/A		UEL: N/A
Autoignition Pt:	NE		
Suitable Extinguishing Media:	Suitable: Water spray.		
Fire Fighting Instructions:	Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s):		
Flammable Properties and Hazards:	No data available.		
Hazardous Combustion Products:	No data available.		

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled:	PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL. Evacuate area. PROCEDURE(S) OF PERSONAL PRECAUTION(S) Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Methods for cleaning up: Absorb on sand or vermiculite and place in closed containers for disposal.
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7. Handling and Storage

Precautions To Be Taken in Handling: User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing.

Precautions To Be Taken in Storing: Suitable: Keep tightly closed.

8. Exposure Controls/Personal Protection

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits
38714-47-5	Zinc(2+), tetraammine-, (T-4)-, carbonate (1:1)	No data.	No data.	No data.
7722-84-1	Hydrogen peroxide	PEL: 1 ppm	TLV: 1 ppm	No data.
68515-73-1	D-Glucopyranose, oligomeric, decyl octyl glycosides	No data.	No data.	No data.
110615-47-9	D-Glucopyranose, oligomeric, C10-16-alkyl glycosides	No data.	No data.	No data.
144538-83-0	Aspartic acid, N-(1,2-dicarboxyethyl)-, tetrasodium salt	No data.	No data.	No data.
77-92-9	Citric acid	No data.	No data.	No data.
55965-84-9	mixture of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7]and 2-methyl-2H -isothiazol-3-	No data.	No data.	No data.
7732-18-5	Water	No data.	No data.	No data.

Respiratory Equipment (Specify Type):

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Eye Protection:

Chemical safety goggles.

Protective Gloves:

Wear appropriate protective gloves to prevent skin exposure.

Other Protective Clothing:

No special requirements under normal use conditions.

Engineering Controls (Ventilation etc.):

Safety shower and eye bath. Mechanical exhaust required.

Work/Hygienic/Maintenance Practices:

Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS.
Country Source Type Value.
USA MSHA Standard-air TWA 1 PPM (1.4 MG/M3)

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9. Physical and Chemical Properties

Physical States: [] Gas [X] Liquid [] Solid
Appearance and Odor: Opaque white liquid with lemon fragrance.
pH: ~ 5.00 - 6.50
Melting Point: NE
Boiling Point: >= 212.00 F
Flash Pt: NE Method Used: Estimate
Evaporation Rate: NE
Flammability (solid, gas): No data available.
Explosive Limits: LEL: N/A UEL: N/A
Vapor Pressure (vs. Air or mm Hg): NE
Vapor Density (vs. Air = 1): NE
Specific Gravity (Water = 1): ~ 1.040
Density: ~ 8.67 LB/GA
Bulk density: NP
Solubility in Water: 100%
Saturated Vapor Concentration: NE
Octanol/Water Partition Coefficient: No data.
VOC / Volume: 0.0000 G/L
Autoignition Pt: NE
Decomposition Temperature: NE
Viscosity: NP
Particle Size: NP
Heat Value: NP
Corrosion Rate: NP

10. Stability and Reactivity

Stability: Unstable [] Stable [X]
Conditions To Avoid - Instability: Extremes of temperature and direct sunlight. Excess heat.
Incompatibility - Materials To Avoid: Organic materials, excessive heat, soft metals and reducing agents. Aluminum and Soft Metals.
Hazardous Decomposition or Byproducts: CO, CO2, Hydrogen.
Possibility of Hazardous Reactions: Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Reactions: None.

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11. Toxicological Information

Toxicological Information: CAS# 7722-84-1: Acute toxicity, LD50, Oral, Rat, 1518. MG/KG. Result: Behavioral: Somnolence (general depressed activity). ; Toho Igakkai Zasshi. Journal of Medical Society of Toho University., Toho Daigaku Igakkai, 21-16, Omori-nishi, 5-chome, Ota-ku, Tokyo 143 Japan, Vol/p/yr: 23,531, 1976

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

General Ecological Information: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes in water and oxygen.
CAS# 7722-84-1: Not reported., Dinoflagellate (Polykrikos schwartzii), 10000. - 1000000. UG/L, Reproduction, Water temperature: 22.00 C C. Result: Morphological changes. ; Hydrogen Peroxide as an Extermination Agent Against Cysts of Red Tide and Toxic Dinoflagellates, Ichikawa, S., Y. Wakao, and Y. Fukuyo, 1993

13. Disposal Considerations

Waste Disposal Method: APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION.
Contact a licensed professional waste disposal service to dispose of this material.
Observe all federal, state, and local environmental regulations.

14. Transport Information

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Not regulated as a hazardous material.

DOT Hazard Class:

UN/NA Number:

LAND TRANSPORT (Canadian TDG):

TDG Shipping Name: Not Regulated.

MARINE TRANSPORT (IMDG/IMO):

IMDG/IMO Shipping Name: Not Regulated.

AIR TRANSPORT (ICAO/IATA):

ICAO/IATA Shipping Name: Not Regulated.

15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
38714-47-5	Zinc(2+), tetraammine-, (T-4)-, carbonate (1:1)	No	No	Yes-Cat. N982
7722-84-1	Hydrogen peroxide	Yes 1000 LB	No	No
68515-73-1	D-Glucopyranose, oligomeric, decyl octyl glycosides	No	No	No
110615-47-9	D-Glucopyranose, oligomeric, C10-16-alkyl glycosides	No	No	No
144538-83-0	Aspartic acid, N-(1,2-dicarboxyethyl)-, tetrasodium salt	No	No	No
77-92-9	Citric acid	No	No	No
55965-84-9	mixture of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7]and 2-methyl-2H -isothiazol-3-	No	No	No
7732-18-5	Water	No	No	No

This material meets the EPA ☒ Yes ☐ No Acute (immediate) Health Hazard

'Hazard Categories' defined ☐ Yes ☒ No Chronic (delayed) Health Hazard

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for SARA Title III Sections ☒ Yes ☐ No Fire Hazard
311/312 as indicated: ☐ Yes ☒ No Sudden Release of Pressure Hazard
 ☐ Yes ☒ No Reactive Hazard

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
38714-47-5	Zinc(2+), tetraamine-, (T-4)-, carbonate (1:1)	CA PROP.65: No; CA TAC, Title 8: Yes - Cat., Yes - Cat.
7722-84-1	Hydrogen peroxide	CA PROP.65: No; CA TAC, Title 8: Title 8
68515-73-1	D-Glucopyranose, oligomeric, decyl octyl glycosides	CA PROP.65: No; CA TAC, Title 8: No
110615-47-9	D-Glucopyranose, oligomeric, C10-16-alkyl glycosides	CA PROP.65: No; CA TAC, Title 8: No
144538-83-0	Aspartic acid, N-(1,2-dicarboxyethyl)-, tetrasodium salt	CA PROP.65: No; CA TAC, Title 8: No
77-92-9	Citric acid	CA PROP.65: No; CA TAC, Title 8: No
55965-84-9	mixture of: 5-Chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H -isothiazol-3-	CA PROP.65: No; CA TAC, Title 8: No
7732-18-5	Water	CA PROP.65: No; CA TAC, Title 8: No

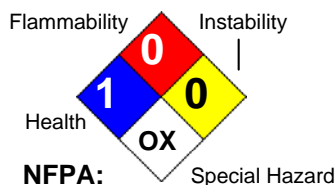
16. Other Information

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Hazard Rating System:

HEALTH		1
FLAMMABILITY		0
PHYSICAL		0
PPE		B

HMIS:



Additional Information About This Product: No data available.

This Product: