

Material Safety Data Sheet (MSDS)

Fluke BP290, Lithium-ion battery pack

partnumber 4025762

Fluke BP291, Lithium-ion battery pack

partnumber 3894688

Chemical System: Lithium-ion (this is: NO Lithium-metal).

Each battery pack stores less than 100 Wh of energy (<100 Wh), each cell stores less than 20 Wh of energy. Packs contain 0% Cd, 0% Hg, 0% Pb.

Each battery pack contains less than 8g of equivalent Lithium.

This MSDS applies to the batteries having the following identifications and characteristics:

Battery details	Fluke BP290	Fluke BP291
Barcode number text	0040 244 0144 <u>2</u>	0040 244 0143 <u>2</u>
Chemistry	Li-ion (secondary battery, rechargeable)	
Cell or battery?	Battery pack	
Number of cells	3	6
Nominal voltage	10.8V	
Capacity of pack	2.5 Ah / 27 Wh	5.0 Ah / 54 Wh
Country of origin	Made in China	
Status indicator, type	'Test' button and LED charge status indicator	

Cells used in this battery

These battery packs are built on cells manufactured by LG Chemical Ltd. The Safety Data Sheet information as provided by this cell-manufacturer is included within this document, starting from page 3.

Contact information: Fluke Corporation, 6920 Seaway Blvd, Everett, WA 98203, USA

Conformance information:

These battery packs have been tested and were found to comply with the criteria of "UN Model Regulations, Manual of Test and Criteria, Part III, subsection 38.3, 5th edition, Amendment 1", also known as "ST/SG/AC.10/11/Rev.5", or "UN38.3 – 2014".

Precautions for handling and use:

- Do not disassemble or deform the battery
- Do not expose to fire, or dispose of in fire
- Avoid excessive physical shock or vibration
- Avoid short circuiting the battery
- Do not immerse in water
- Never use a modified or damaged charger
- Never use a battery that shows signs of damage
- Each battery pack stores < 100 Wh of energy
- Contains 0% Cd, 0%Hg, 0%Pb
- Only charge the battery in an approved charger; either use a Fluke testtool that lists compatibility with the BP290 or BP291, or use external charger EBC290.
- Store in a cool, dry, well-ventilated area
- Use for the specified application only
- Refer to instruction sheet of associated testtool for operating instructions
- Keep the battery pack out of reach of children.

The information contained within this document is provided for your information only.

This battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication standard requirement for preparation of a material safety data sheet. This document at hand is therefore provided as a service to our customers only.

Packing Instructions (P.I.)

Battery packaging and delivery	IATA Packing Instructions (P.I.)
When battery is packaged separately (e.g. a replacement battery pack):	P.I. 965 applies
When battery is packaged with a testtool, not contained in it (e.g. Fluke-190-series-II):	P.I. 966 applies
When battery is contained within a testtool, then packaged (e.g. Fluke-430-series-II):	P.I. 967 applies

Ensure that any shipment packaging that contains these batteries is properly marked on the outside of the package for containing Li-ion batteries, using the label as described in the 'Additional Requirements Section' of Packing Instructions 965...970. Minimum size of the label is 120 x 110 mm (4.75 x 4.33 inches).

This document comprises 12 pages (including this page).

Follow-on pages are:

- *LG Chemical Ltd – Safety Data Sheet for Model ICR18650B4 cells, issued January 2016 (2016-01-12, print-date 2016-02-05; 10 pages)*

SAFETY DATA SHEET

According to HCS-2012 APPENDIX D to §1910.1200

1. Identification

(1) Product Identifier

Product Name : Lithium ion cylindrical battery
Product Model : INR18650B4

(2) Other Means of Identification

Product Description : 18650 2.6Ah

(3) Recommended Use and Restriction

Recommended Use : Laptop computer, Bluetooth speaker, Powerbank and other portable electronic products

Restriction on Use : No information available

(4) Manufacturer

LG Chemical Ltd.
LG Twin Tower Youi-Daero 128, Youngdeungpo-Ku
Seoul, Korea
Postal Code : 07336

(5) Emergency Telephone Number

82-2-3773-XXXX +82 2 3773 7119

2. Hazards Identification

(1) Classification of the Chemical

The battery is considered as an article, and this product is not classified as hazardous.

(2) Label Elements

Pictogram(s)	: No pictogram is used.
Signal word	: No signal word is used.
Hazard statements	: Not classified
Precautionary statements	: Not classified

(3) Description of Any Hazards Not Otherwise Classified

Do not dismantle, open or shred the battery. The ingredients contained within could be harmful.

(4) Ingredient with Unknown Acute Toxicity

No information available

3. Composition / Information on Ingredients

Hazardous Ingredients	%	CAS Number
Nickel compound	0-25	1313-99-1
Manganese compound	0-15	1313-13-9
Cobalt compound	4-50	1307-96-6
Styrene-Butadiene-Rubber	<1	27288-99-9
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Aluminum Foil	2-10	7429-90-5
Copper Foil	2-10	7440-50-8
Graphite	10-30	7782-42-5
Electrolyte (Ethylene carbonate)	10-20	96-49-1
Lithium hexafluorophosphate	<5	21324-40-3
Stainless steel, Nickel and inert materials	Remainder	N/A

4. First Aid Measures

The hazardous components of this battery are contained within a sealed unit. If exposure to internal materials within battery due to damaged outer casing, the following actions are recommended.

Inhalation

Leave area immediately and seek medical attention.

Eye contact

Rinse eyes with water for at least 15 minutes and seek medical attention.

Skin contact

Wash area thoroughly with soap and water and seek medical attention.

Ingestion

Get medical attention immediately.

5. Fire Fighting Measures**(1) General Hazard**

Battery is not flammable but internal organic material will burn if the battery is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

(2) Suitable Extinguishing Media

Use extinguishing media suitable for the materials that are burning.

: Water, Carbon dioxide, Dry Chemical, Foam, etc.

(3) Special Firefighting Instructions

If possible, remove battery(s) from fire fighting area. If heated above 125°C, battery(s) may explode/vent.

(4) Firefighting Equipment

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. Accidental Release Measures**(1) Personal Precautions, Protective Equipment and Emergency Procedures**

As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment.

(2) Methods and Materials for Containment and Cleaning Up

Evacuate spill area immediately and remove sources of ignition. Do NOT touch spilled material. Cleanup personnel must be trained in the safe handling of this product. Spills may be absorbed on non-reactive absorbents such as vermiculite. Place batteries into individual plastic bags and then place into appropriate containers and close tightly for disposal. Ensure that cleanup procedures do not expose spilled material to any moisture. Immediately transport closed containers outside. Lined steel drums are suitable for storage of damaged cells or batteries until proper disposal can be arranged.

7. Handling and Storage

(1) Precautions for Safe Handling

Avoid short circuiting the battery. Avoid mechanical damage of the battery.
Do not open or disassemble. Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.

(2) Cautions for Safe Storage, Including Any Incompatibilities

Store in a dry and cool (eg. room temperature (approx. 20°C)) place at approx. 20~60% of the nominal capacity. (OCV approx. 3.6 - 3.9 V/cell). Keep in closed original container.

8. Exposure Controls / Personal Protection

(1) Exposure Limit Value

Airborne exposures to hazardous substances are not expected when the batteries are used for their intended purposes. Exposure standards are not applicable to the sealed articles.

(2) Engineering Controls

Special ventilation is not required when using these products in normal use scenarios. Ventilation is required if there is leakage from the battery.

(3) Individual Protection Measure

Eye and Face protection: Eye protection is not required when handling batteries during normal use. Wear safety glasses/goggles if handling a leaking or ruptured battery.

Skin (Hand) protection: Hand protection is not required when handling the cell or battery during normal use. PVC gloves are recommended when dealing with a leaking or ruptured battery.

Foot protection : Steel toed shoes recommended for large container handling.

Skin (clothing) protection: Skin protection is not required when handling the battery during normal use. Wear long sleeved clothing to avoid skin contact if handling a leaking or ruptured battery. Soiled clothing should be washed with detergent prior to re-use.

Respiratory protection: During routine operation, a respirator is not required. However, if dealing with an electrolyte leakage and irritating vapors are generated, an approved half face inorganic vapor and gas/acid/particulate respirator is required. SCBA required in the event of a fire.

Other Protective Equipment: Have a safety shower or eye wash station readily available

9. Physical and Chemical Properties

State	Solid
Odor	N/A
pH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

10. Stability and Reactivity

(1) Reactivity

None during normal operating or handling conditions

(2) Chemical Stability

Stable under normal condition

(3) Possibility of Hazardous Reactions

No hazardous reactions known

(4) Conditions To Avoid

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

(5) Incompatible Materials

None during normal operation

Avoid exposure to heat, open flame, and corrosives.

(6) Hazardous Decomposition Products

None during normal operating conditions

If batteries are opened, hydrogen fluoride and carbon monoxide may be released.

11. Toxicological Information

(1) Information on toxicological effects

The hazardous components of the batteries are contained within a sealed unit. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the battery integrity remains and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperature or is mechanically, electrically or physically abused/damaged.

The following toxicology data are in respect to if a person comes into contact with the electrolyte.

Swallowed : The electrolyte contained within the battery is a corrosive liquid. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns to the gastrointestinal tract. During normal usage ingestion should not be a means of exposure.

Eye: The electrolyte contained within the battery is a corrosive liquid and it is expected that it would cause irreversible damage to the eyes. Contact may cause corneal burns. Effects may be slow to heal after eye contact. Correct handling procedures incorporating appropriate eye protection should minimize the risk of eye irritation.

Skin: The electrolyte contained within the battery is a corrosive liquid and it is expected that it would cause skin burns or severe irritation to the skin if not washed off immediately. Correct handling procedures should minimize the risk of skin irritation. People with pre-existing skin conditions, such as dermatitis, should take extreme care so as not to exacerbate the condition.

Inhalation: Inhalation of vapors from a leaking battery is expected to cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

(2) Information on Toxicological Characteristics

This product does not elicit toxicological properties during routine handling and use. If the batteries are opened through misuse or damage, discard immediately. Internal components of battery are irritants and sensitizers

Acute toxicity	: No data available
Skin corrosion/irritation	: No data available
Serious eye damage/irritation	: No data available
Respiratory sensitization	: No data available
Skin sensitization	: No data available
Carcinogenicity	: No data available
Germ Cell Mutagenicity	: No data available
Reproductive Toxicity	: No data available
STOT-Single Exposure	: No data available
STOT-Repeated Exposure	: No data available
Aspiration Hazard	: No data available

12. Ecological Information

(1) Ecotoxicity

No ecological information available

(2) Persistence and Degradability

No ecological information available

(3) Bioaccumulative Potential

No ecological information available

(4) Mobility in Soil

No ecological information available

(5) Other Adverse Effects

No ecological information available

13. Disposal Considerations

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

14. Transport Information

Lithium batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- UN 3480, Lithium ion batteries
- UN 3481, Lithium ion batteries contained in equipment; or
- UN 3481, Lithium ion batteries packed with equipment.

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

- The International Civil Aviation Organization (ICAO) Technical Instructions,
- The International Air Transport Association (IATA) Dangerous Goods Regulations

- The International Maritime Dangerous Goods (IMDG) Code,
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations) Sections 173-185 Lithium batteries and cells,
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries,

If those lithium-ion batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods Regulations Section II of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-Dangerous). If those lithium-ion batteries are packed with or contained in an equipment, UN No. is UN3481

Each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;

15. Regulatory Information

This product is not hazardous under the criteria of the Federal Occupational Safety and Health Administration(OSHA) Hazard Communication Standard.(29 CFR 1910.1200)

IATA Dangerous Goods Regulations 59th Edition Effective 1 January 2018.

Hazardous

Non-hazardous

16. Revision and Disclaimer

(1)Preparation and Revision Information

Date of previous revision	: 01/02/2018
Date of this revision	: 04/01/2019
Revision Number	: Rev 2.0

(2) Disclaimer

The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

----- --End of the SDS -----