

	Safety Data Sheet (SDS)	Version: R0001.0005
		Date of issue: 2016-05-10
	LGCHEM JH3 Lithium-Ion Battery Cell * RESU Gen2 Products contain " JH3 cell"	Revision date: 2019-03-15
		Change List: see Section 16.1

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Trade name/designation : LGCHEM JH3 Lithium-Ion Battery Cell
* RESU Gen2 Products [RESU3.3/RESU6.5/RESU10/RESU13/RESU7H/RESU10H/RESU10M] contain " JH3 cell".

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

1.2.1. Relevant identified uses

- Rechargeable Lithium-Ion Battery Cell

1.2.2. Uses advised against

- Not available

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier : LG Chem Ltd.
Address : LG Twin Tower, Youido-Dong, Youngdeungpo-Ku, Seoul, Korea
Telephone : +82-2-3773-6740
Email : lkblive@lgchem.com

1.4. Emergency telephone number

EU-wide emergency number : 112
See section 16.6 for the list of telephone number of poison centers in the European Economic Area.

Legal Remark

U.S.A

- The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200 does not apply to various subcategories including anything defined by OSHA as an "article". The products are defined as "articles", and are exempted from the requirements for Material Safety Data Sheets.

EU

- The products are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as "articles", no substances are intended to be released during handling. Therefore there is no obligation to supply a Safety Data Sheet according to Regulation (EC) 1907/2006, Article 31.

General remark

- This Safety Data Sheet is provided as a service to our customers. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only.
- It should not therefore be construed as guaranteeing any specific property of the product.

SECTION 2: HAZARD IDENTIFICATION

2.1. Classification of the substance/mixture

- No classification is presented since the product is legally an article rather than chemical substance or mixture according to Regulation (EC) No 1272/2008 [CLP] , 67/548/EEC regulation and/or REACH
- While batteries may release hazardous substances if damaged, this is not an intended release as defined under REACH.

2.2. Label elements

2.2.1. Labelling according to Regulation (EC) No 1272/2008 [CLP]

- Not applicable

2.3. Other hazards

- Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**3.1. Substances**

- Not applicable

3.2. Mixtures

- Not applicable

* No classification is presented since the product is legally an article which is subject to EU CLP and/or to 67/548/EEC

Ingredients in Article	CAS No.	REACH registration No.	% [weight]	Classification [1272/2008/EC]
Aluminium Foil	7429-90-5	-	2-10	Water-react 2, H261 Flam. Solid 1, H228 Pyr. Liq. 1, H250
Metal Oxide (proprietary)	-	-	20-50	
Polyvinylidene Fluoride (PVDF)	24937-79-9	-	<5	Not classified
Copper Foil	7440-50-8	-	5-20	Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Carbon (proprietary)	7440-44-0	-	10-20	Self-heat 2, H252 STOT SE 3, H335
Electrolyte (proprietary)	-	-	10-20	Flam Liq 3, H226 Acute Tox. 4, H302 Acute Tox. 4, H312 Skin corr/irrit 2, H315 Skin sensitization 1, H317 Eye dam/irrit 1, H318 Carc. 1B, H350 Aquatic Acute 3, H402 Aquatic Chronic 3, H412
Aluminum, Copper plate and inert materials	Not applicable	-	Remainder	

Lithium-equivalent Content: 18.56g (233 Wh)

LG Chem Technical Strengths (2016) states the latest "Energy Cell (JH3)" has a "High Energy Density" of "410 Wh" (p. 4).
A lithium equivalent content of 18.56g for a 233 Wh battery cell (above) = 32.66 g for a 410 Wh cell. (Si Kinsnella, Jan 10, 2024)

SECTION 4: FIRST AID MEASURES**4.1. Description of first aid measures****General**

- Not a health hazard.

Inhalation

- Not a health hazard.

Skin contact

- Not a health hazard.

Eye contact

- Not a health hazard.

Ingestion

- Get immediate medical advice/attention.

IF EXPOSURE TO INTERNAL MATERIALS WITHIN CELL DUE TO DAMAGED OUTER CASING, THE FOLLOWING ACTIONS ARE RECOMMENDED :**General**

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat/sparks/open flames/hot surfaces.
- Keep/Store away from clothing /combustible materials.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Do not get in eyes, on skin, or on clothing.
- Avoid release to the environment.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.

Inhalation

- Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- Get immediate medical advice/attention.

- Take specific treatment if needed.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

Skin contact

- Wash with plenty of soap and water.
- Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- Take off contaminated clothing and wash it before reuse.
- Get immediate medical advice/attention.
- If skin irritation or rash occurs: Get medical advice/attention.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

Eye contact

- Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Get immediate medical advice/attention.

Ingestion

- Rinse mouth.
- Immediately call a POISON CENTER or doctor/physician.
- Get immediate medical advice/attention.
- About whether I should induce vomiting Take the advice of a doctor.

4.2. Most important symptoms and effects, both acute and delayed

- Not available

4.3. Indication of any immediate medical attention and special treatment needed

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media

- Use extinguishing media suitable for the materials that are burning.

Unsuitable extinguishing media

- Not available

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

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

5.3. Advice for firefighters

- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Avoid inhalation of materials or combustion by-products.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Wear appropriate protective equipment.
- Use fire fighting procedures suitable for surrounding area.
- If possible, remove cell(s) from fire fighting area. If heated above 150°C, cell(s) may combust/vent.
- Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment: Wear proper protective equipment
- Emergency procedures:
 - On Land
Place material into suitable containers and call local fire/police department.
 - In Water
If possible, remove from water and call local fire/police department.
- If required, notify relevant authorities according to all applicable regulations.

6.1.2. For emergency responders

- Wear proper personal protective equipment and avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.

6.2. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- Advise emergency services.

6.3. Methods and material for containment and cleaning up**6.3.1. For containment**

- Control personal contact by using protective equipment.
- Prevent, by any means available, containment from entering drains or water course.

6.3.2. For cleaning up

- Dispose of waste in accordance with local regulation.

6.3.3. Other information

- Not available

6.4. Reference to other sections

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for information on disposal.

SECTION 7: HANDLING AND STORAGE**7.1. Precautions for safe handling**

- No special protective clothing required for handling individual cells.
- Do not expose battery or cell to extreme temperatures or fire.
- Do not disassemble, crush or puncture battery.
- Do not overcharge or over discharge the battery.
- Do not connect (short circuit) positive and negative terminals.
- Do not place the batteries on conductive metal.

7.2. Conditions for safe storage, including any incompatibilities

- Store in a cool, dry place.

7.3. Specific end use(s)

- See Section 1 for information on 1.2 Relevant identified uses.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1. Control parameters****8.1.1. Occupational exposure limits****European Union (EU) Commission Directive 2006/15/EC (IOELVs)**

- Not available

European Union (EU) Commission Directive 2006/15/EC (IOELVs) - Skin

- Not available

8.1.2. Recommended Monitoring Procedures

- Not available

8.1.3. DNEL/PNEC - Values

- Not available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Keep away from heat and open flame.
- Store in cool and dry place.

8.2.2. Individual protection measures, such as personal protective equipment

Hand protection

- Not required for handling of cells.

Eye protection

- Not required beyond safety practices of employer.

Respiratory Protection

- Not required during normal operations.
- SCBA required in the event of fire.

Skin protection

- Steel toed shoes recommended for large container handling.

Others

- Not available

Thermal hazards

- Not available

8.2.3 Environmental exposure controls

- Not available

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance(State)	Solid
Appearance(Color)	Not available
Odor	Not available
Odor threshold	Not available
pH	Not available
Melting point/Freezing point	Not available
Initial boiling point and boiling range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability(solid, gas)	Not available
Upper/Lower Flammability or explosive limits	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	Not available
Solubility	Insoluble
Partition coefficient of n-octanol/water	Not available
Autoignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	Not available
Oxidising properties	Not available

9.2. Other information

- Not available

SECTION 10: STABILITY AND REACTIVITY**10.1. Reactivity**

- None

10.2. Chemical Stability

- None during normal operating conditions.

10.3. Possibility of hazardous reactions

- None during normal operating conditions.

10.4. Conditions to avoid

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

10.5. Incompatible materials

- None during normal operating conditions.

10.6. Hazardous decomposition products

- None during normal operating conditions.
- If cells are damaged, hydrogen fluoride and carbon monoxide may be released.

SECTION 11: TOXICOLOGICAL INFORMATION**11.1. Acute toxicity**

- **Oral**
 - This product does not elicit toxicological properties during routine handling and use.
- **Dermal**
 - This product does not elicit toxicological properties during routine handling and use.
- **Inhalation**
 - This product does not elicit toxicological properties during routine handling and use.

11.2. Skin corrosion/irritation

- No irritation.
- If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

11.3. Serious eye damage/irritation

- Not available

11.4. Respiratory sensitization

- Not available

11.5. Skin sensitization

- No sensitization.
- If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

11.6. Germ cell mutagenicity

- Not available

11.7. Carcinogenicity

- Not available

11.8. Reproductive toxicity

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

11.9. Specific target organ toxicity(single exposure):

- Not available

11.10. Specific target organ toxicity(repeated exposure):

- Not available

11.11. Aspiration hazard

- Not available

11.12. Other Information

- Not available

SECTION 12: ECOLOGICAL INFORMATION**12.1. Toxicity****12.1.1. Fish**

- Not available

12.1.2. Invertebrate

- Not available

12.1.3. Algae

- Not available

12.2. Persistence and degradability**12.2.1. Persistence**

- Not available

12.2.2. Degradability

- Not available

12.3. Bioaccumulative potential**12.3.1. Bioaccumulation**

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

12.3.2. Biodegradability

- Not available

12.4. Mobility in soil

- Not available

12.5. Results of PBT and vPvB assessment

- Not available

12.6. Other adverse effects

- Not available

SECTION 13: DISPOSAL CONSIDERATIONS**13.1. Waste treatment methods**

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

Follow Directive 2006/66/EC.

California regulated debris

RCRA Waste Code : Non regulated

SECTION 14: TRANSPORT INFORMATION**14.1. UN No.****14.1.1. UN No. (ADR/RID/ADN)**

- 3480 / 3481

14.1.2. UN No. (IMDG)

- 3480 / 3481

14.1.3. UN No. (ICAO/IATA)

- 3480 / 3481

14.2. UN proper shipping name

- Lithium Ion Batteries / Lithium Ion Batteries contained in equipment

14.3. Transport hazard class(es)**14.3.1. Hazard Class**

- Class 9

14.3.2. Hazard label

- Miscellaneous

14.4. Packing group**14.4.1. ADR/RID/ADN Packing group**

- II

- Packing Instruction: P903

- Special Provision: 188, 230, 310, 957

- EmS: F-A, S-I

14.4.2. IMDG Packing group

- II

- Packing Instruction: P903

- Special Provision: 188, 230, 310, 957

- EmS: F-A, S-I

14.4.3. ICAO/IATA Packing group

- II

- Packing Instruction: 965, 967

- Special Provision: A45, A88, A99

- Maximum Gross Weight per Package on Passenger and Cargo Aircraft: 5 kg

- Maximum Gross Weight per Package on Cargo Only Aircraft: 35 kg

14.5. Environmental hazard

- Not available

14.6. Special precautions for user

- Local transport follows in accordance with Dangerous goods Safety Management Law.

- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

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

- Not available

SECTION 15: REGULATORY INFORMATION**15.1. Safety, health and environmental regulation / legislation specific for the substance or mixture****15.1.1. Europe regulatory**

- Information according to REACH
REACH SVHC
 - This product does contain 1,3-Propanesultone without intended release.
 - This product is an article, without intended release of a chemical substance, under the Regulation No 1907/2006 of the European Parliament and the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (refer to REACH, Article 3(3)). Therefore, it is not subject to the pre-registration or the registration process.
- Information according to Regulation (EC) No 1272/2008 [CLP]
- Information according to Directive 67/548/EEC

15.1.2. Other regulatory

- Information according to ISHA
- Information according to TCCA and other chemical management regulations
- Dangerous Substances Safety Management Act
- Regulation of Disposal
- OSHA hazard communication standard (29 CFR 1910.1200)
 Hazardous Non-hazardous

15.2. Chemical Safety Assessment

- Not conducted

SECTION 16: OTHER INFORMATION**16.1. Indication of changes**

- The Safety Data Sheet has been reviewed and the data therein were revised and laid out according the requirements of the Commission Regulation (EU) No. 453/2010

Version	Date	Revision History
R1.1	2013.11.18	• Established
R1.2	2017.03.31	• Add 16.1
R1.3	2017.06.28	• Change the product name (Li ion Polymer Battery → Li ion Battery Cell)
R1.4	2018.10.10	• Add RESU Gen2 Products [RESU13]
R1.5	2019.03.15	• Add RESU Gen2 Products [RESU10M]

16.2. Abbreviations and acronyms

- 1272/2008 CLP : Classification, Labelling and Packaging regulation.
- REACH : Registration, Evaluation and authorisation of chemical substances.
- Hazard Statements (Section 3)
 - H226: Flammable liquid and vapour.
 - H228: Flammable solid.
 - H250: Catches fire spontaneously if exposed to air.
 - H252: Self-heating in large quantities; may catch fire.
 - H261: In contact with water releases flammable gases.
 - H302: Harmful if swallowed.
 - H312: Harmful in contact with skin.
 - H315: Causes skin irritation.
 - H317: May cause an allergic skin reaction.
 - H318: Causes serious eye damage.
 - H335: May cause respiratory irritation.
 - H350: May cause cancer.
 - H400: Very toxic to aquatic life.
 - H402: Harmful to aquatic life
 - H410: Very toxic to aquatic life with long lasting effects.
 - H412: Harmful to aquatic life with long lasting effects.

16.3. Key literature references and sources for data

- This Safety Data Sheet was compiled with data and information from the following sources: RTECS, ECOSAR, HSDB, SIDS SIAP, ChemWATCH, CESAR, Chemical DB

16.4. Classification procedure

- The mixture classification has been derived based on the classification of the individual components in accordance with the rules set out in Regulation (EC) No 1272/2008 (CLP) as well as the translation tables in Annex VII to the same regulation.

16.5. Training advice

- Not available

16.6. Further information

- This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only.

- It should not therefore be construed as guaranteeing any specific property of the product.

- Contact a poison control centre, List of Telephone Numbers : AUSTRIA (Vienna Wien) +43 1 406 43 43; BELGIUM (Brussels Bruxelles) +32 70 245 245; BULGARIA (Sofia) +359 2 9154 409; CZECH REPUBLIC (Prague Praha) +420 224 919 293; DENMARK (Copenhagen) 82 12 12 12; ESTONIA (Tallinn) 112; FINLAND (Helsinki) +358 9 471 977; FRANCE (Paris) +33 1 40 0548 48; GERMANY (Berlin) +49 30 19240; GREECE (Athens Athinai) +30 10 779 3777; HUNGARY (Budapest) 06 80 20 11 99; ICELAND (Reykjavik) +354 525 111, +354 543 2222; IRELAND (Dublin) +353 1 8379964; ITALY (Rome) +39 06 305 4343; LATVIA (Riga) +371 704 2468; LITHUANIA (Vilnius) +370 5 236 20 52 or +370 687 53378; MALTA (Valletta) 2425 0000; NETHERLANDS (Bilthoven) +31 30 274 88 88; NORWAY (Oslo) 22 591300; POLAND (Gdansk) +48 58301 65 16 or +48 58 349 2831; PORTUGAL (Lisbon Lisboa) 808 250 143; ROMANIA (Bucharest) +40 21 3183606 SLOVAKIA (Bratislava) +421 2 54 77 4166; SLOVENIA (Ljubljana) + 386 41 650 500; SPAIN (Barcelona) +34 93 227 98 33 or +34 93 227 54 00 bleep 190; SWEDEN (Stockholm) 112 or +46 8 33 12 31 (mon-fri 9.00-17.00); UNITED KINGDOM (London) 112 or 0845 4647 (NHS Direct).