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Revision Number 2

1. Identification

Product identifier

Product Name LITHIUM THIONYL CHLORIDE CELLS AND BATTERIES

Other means of identification

UN/ID no UN3090 (if packed in or with equipment use UN3091)**Synonyms** Hermetically-Sealed Lithium Thionyl Chloride Cells and Batteries – Including all 100, 150,165, 180, 200 Moderate Rate, QTC, MWD and VHT series

Recommended use of the chemical and restrictions on use

Recommended use No information available**Restrictions on use** Do not short circuit or expose to temperatures higher than the maximum temperature rating specified by the manufacturer. Do not recharge, over charge or crush any cell or pack. Ensure cells and batteries are safely handled and stored. Review Section 7 completely before use.

Details of the supplier of the safety data sheet

Supplier AddressInteger Holdings Corp.
2595 Dallas Pkwy #310
Frisco, TX 75034
T: 214-618-5248**Manufacturer Address**Electrochem Solutions
670 Paramount Drive
Raynham, MA 02767
T: 781-830-5800

Emergency telephone number

Emergency Telephone CHEMTREC: +1-703-527-3887 (INTERNATIONAL)
1-800-424-9300 (NORTH AMERICA) (Account# 24706)

2. Hazard(s) identification

Classification

This product is not considered hazardous by the OSHA Hazard Communication Standard 2012 (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an SDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category A
Serious eye damage/eye irritation	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements**Danger****Hazard statements**

Harmful if swallowed

Harmful if inhaled

Causes severe skin burns and eye damage

**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Use only outdoors or in a well-ventilated area

Do not breathe dusts or mists

Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

Immediately call a POISON CENTER or doctor

Specific treatment (see supplemental first aid instructions on this label)

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Immediately call a POISON CENTER or doctor

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower

Wash contaminated clothing before reuse

IF INHALED: Remove person to fresh air and keep comfortable for breathing

Immediately call a POISON CENTER or doctor

IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell

Rinse mouth

Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other information

Not applicable

Unknown acute toxicity

5 % of the mixture consists of ingredient(s) of unknown toxicity

3. Composition/information on ingredients**Substance**

Not applicable.

Mixture**Synonyms**

Hermetically-Sealed Lithium Thionyl Chloride Cells and Batteries – Including all 100, 150,165, 180, 200 Moderate Rate, QTC, MWD and VHT series

Chemical name	CAS No	Weight-%	Trade secret
Thionyl chloride	7719-09-7	25-39	*
Lithium	7439-93-2	1.5-5	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures

General advice	First aid is upon rupture of sealed battery.
Inhalation	IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Skin contact	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
Ingestion	IF SWALLOWED: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a POISON CENTER or doctor/physician if you feel unwell.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	Use of water spray when fighting a lithium fire may be inefficient. However, copious amounts of water may be used to cool a battery fire and extinguish any surrounding combustible fires.
Specific hazards arising from the chemical	The electrolyte will release toxic sulfur dioxide gas.
Explosion data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Wash thoroughly after handling.

Other information Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up During a release, ensure the Personal Protection listed in Section 8 is worn. Neutralize any electrolyte contaminated surfaces with baking soda, soda lime or sodium bicarbonate. Transfer damaged battery and any clean up materials to a sealed container a neutralizing material as stated above. Ensure the container is properly labeled.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Do not crush, pierce, short circuit (+) and (-) battery terminals with conductive (metal) goods. Do not directly heat or solder. Do not throw into fire. Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in non-conductive (plastic) trays. Cells or batteries that have been dropped or experience mechanical shock should be isolated and monitored for approximately 5 days to identify a possible internal short circuit and resulting fire. Handle in accordance with good industrial hygiene and safety practice. Do not breathe dust. Do not breathe vapor. Use personal protection equipment.

Conditions for safe storage, including any incompatibilities

Storage Conditions Store at room temperature. Do not store near combustible materials. Do not store in high humidity environments. Never stack heavy objects on top of battery boxes. Keep batteries in original packaging until use and do not expose them to unnecessary or excessive handling.

8. Exposure controls/personal protection

Control parameters

Exposure Limits The following exposure limits are provided for information only; exposure is not expected under normal conditions of use or storage.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Thionyl chloride 7719-09-7	Ceiling: 0.2 ppm	(vacated) Ceiling: 1 ppm (vacated) Ceiling: 5 mg/m ³	Ceiling: 1 ppm Ceiling: 5 mg/m ³

Appropriate engineering controls

Engineering controls Showers
Eyewash stations

Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection	None required for normal handling of the finished product. If necessary to handle damaged product where exposure to the electrolyte is a possibility, chemical splash goggles and a face shield are recommended.
Hand protection	None required for normal handling of the finished product. If necessary to handle damaged product where exposure to the electrolyte is a possibility, chemically resistant gloves are recommended.
Skin and body protection	None required for normal handling of the finished product. If necessary to handle damaged product where exposure to the electrolyte is a possibility, a chemically resistant apron is recommended.
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Physical state	Solid
Color	No information available
Odor	None
Odor threshold	No data available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	N/A	Not applicable unless there is exposure to an electrolyte
Melting point / freezing point	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: -104.5 °C
Boiling point / boiling range	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: 76.11 °C
Flash point	N/A	Not applicable unless there is exposure to an electrolyte
Evaporation rate	N/A	Not applicable unless there is exposure to an electrolyte
Flammability (solid, gas)	N/A	Not applicable unless there is exposure to an electrolyte
Flammability Limit in Air		Not applicable unless there is exposure to an electrolyte
Upper flammability or explosive limits	N/A	
Lower flammability or explosive limits	N/A	
Vapor pressure	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: 97 mm Hg @ 20 °C
Vapor density	N/A	Not applicable unless there is exposure to an electrolyte
Relative density	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: 1.635
Water solubility	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: Decomposes violently on contact with water

Solubility(ies)	N/A	Not applicable unless there is exposure to an electrolyte
Partition coefficient	N/A	Not applicable unless there is exposure to an electrolyte
Autoignition temperature	N/A / °F	Not applicable unless there is exposure to an electrolyte
Decomposition temperature	No data available	Not applicable unless there is exposure to an electrolyte
Kinematic viscosity	N/A	Not applicable unless there is exposure to an electrolyte
Dynamic viscosity	N/A	Not applicable unless there is exposure to an electrolyte: Thionyl Chloride: ca. 0.6 mPas @ 25°C

Other information

Explosive properties	Not applicable unless there is exposure to an electrolyte.
Oxidizing properties	Not applicable unless there is exposure to an electrolyte.
Softening point	No information available
Molecular weight	No information available
VOC Content (%)	Not applicable unless there is exposure to an electrolyte
Liquid Density	No information available
Bulk density	No information available

10. Stability and reactivity

Reactivity	None under normal use conditions.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal use conditions. In the event of a leak or rupture: electrolyte and lithium will react with water.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Under normal use, batteries are not incompatible. The electrolyte is incompatible with: Strong acids. Strong bases. Strong oxidizing agents.
Hazardous decomposition products	Lithium oxides. Sulfur dioxide. Hydrogen chloride. Bromine. Chlorine.

11. Toxicological information**Information on likely routes of exposure**

Product Information	Exposure is not expected for product under normal conditions of use. In the event of an exposure to electrolyte the following toxicological information is provided.
Inhalation	Harmful if inhaled.
Eye contact	Corrosive to the eyes and may cause severe damage including blindness.
Skin contact	Causes severe burns.
Ingestion	Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms	Redness. Burning. May cause blindness. Coughing and/ or wheezing.
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Acute toxicity**Numerical measures of toxicity**

The following values are calculated based on chapter 3.1 of the GHS document.

ATEmix (oral) 1,229.50 mg/kg

ATEmix (inhalation-dust/mist) 3.85 mg/l

Unknown acute toxicity 5 % of the mixture consists of ingredient(s) of unknown toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Thionyl chloride 7719-09-7	= 270 mg/kg (Rat)	-	= 500 ppm (Rat) 1 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation	Classification based on data available for ingredients. Causes burns.
Serious eye damage/eye irritation	Classification based on data available for ingredients. Risk of serious damage to eyes. Causes burns.
Respiratory or skin sensitization	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Target organ effects	Eyes, Skin, Respiratory system, Gastrointestinal tract (GI), Kidney, Liver.
Aspiration hazard	No information available.
Other adverse effects	No information available.
Interactive effects	No information available.

12. Ecological information

Ecotoxicity	Avoid any release to waterways, groundwater, or any environmental media. Harmful effects due to pH shift are expected.
Persistence and degradability	No information available.
Bioaccumulation	There is no data for this product.
Other adverse effects	No information available.

13. Disposal considerations**Waste treatment methods**

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.

14. Transport information

Note: Intended for All lithium batteries:
Lithium cells and batteries must successfully pass the tests defined in "UN Manual of Tests and Criteria", Section 38.3 and may require they be manufactured under a Quality Management Program. Lithium Metal and Lithium Ion cells and batteries, when shipped by themselves (not in or with equipment) are forbidden as cargo on passenger aircraft and must be marked as "Cargo Air Only" if shipped by air (they must be marked "Cargo Air Only" for all modes of DOT transport). Lithium Ion cells and batteries, when shipped by themselves (not in or with equipment) by air must be shipped at or below 30% full charge. Note: Some regulations require a summary of test results and/or a copy of the Quality Management Programs be made available for Lithium cells and batteries
For specific transport information for all variations of Thionyl cells, please review the Product Data Sheet. This can be sent upon request. Please contact the manufacturer.

DOT

UN/ID no	UN3090 (if packed in or with equipment use UN3091)
Proper shipping name	LITHIUM METAL BATTERY
Hazard class	9
Special Provisions	422, A54
Description	UN3090, LITHIUM METAL BATTERY, 9
Emergency Response Guide Number	138

TDG

UN/ID no	UN3090 (if packed in or with equipment use UN3091)
Proper shipping name	LITHIUM METAL BATTERIES
Hazard class	9
Description	UN3090, LITHIUM METAL BATTERIES, 9

MEX

UN/ID no	UN3090 (if packed in or with equipment use UN3091)
Proper shipping name	LITHIUM METAL BATTERIES
Hazard class	9
Special Provisions	188, 230, 310
Packing group	II
Description	UN3090, LITHIUM METAL BATTERIES, 9, II

IATA

UN number	UN3090 (if packed in or with equipment use UN3091)
UN proper shipping name	Lithium metal batteries
Transport hazard class(es)	9
ERG Code	9FZ
Description	UN3090, Lithium metal batteries, 9

IMDG

UN number	UN3090 (if packed in or with equipment use UN3091)
UN proper shipping name	LITHIUM METAL BATTERIES
Transport hazard class(es)	9
EmS-No	F-A, S-I
Special Provisions	188, 230, 310, 376, 377, 384
Description	UN3090, LITHIUM METAL BATTERIES, 9

15. Regulatory information**International Inventories**

TSCA Contact supplier for inventory compliance status.

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

US Federal Regulations**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations**US State Regulations**

Chemical name	New Jersey	Massachusetts	Pennsylvania
Thionyl chloride 7719-09-7	X	X	X
Lithium 7439-93-2	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

<u>NFPA</u>	Health hazards	3	Flammability	0	Instability	0	Physical and chemical properties	-
<u>HMIS</u>	Health hazards	0	Flammability	0	Physical hazards	0	Personal protection	X

Key or legend to abbreviations and acronyms used in the safety data sheet**Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
 U.S. Environmental Protection Agency ChemView Database
 European Food Safety Authority (EFSA)
 EPA (Environmental Protection Agency)
 Acute Exposure Guideline Level(s) (AEGL(s))
 U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
 U.S. Environmental Protection Agency High Production Volume Chemicals
 Food Research Journal
 Hazardous Substance Database
 International Uniform Chemical Information Database (IUCLID)
 Japan GHS Classification
 Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
 NIOSH (National Institute for Occupational Safety and Health)
 National Library of Medicine's ChemID Plus (NLM CIP)
 National Library of Medicine's PubMed database (NLM PUBMED)
 National Toxicology Program (NTP)
 New Zealand's Chemical Classification and Information Database (CCID)
 Organization for Economic Co-operation and Development Environment, Health, and Safety Publications
 Organization for Economic Co-operation and Development High Production Volume Chemicals Program
 Organization for Economic Co-operation and Development Screening Information Data Set
 RTECS (Registry of Toxic Effects of Chemical Substances)
 World Health Organization

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Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet