

**LITHIUM METAL CELLS**  
**SAFETY DATA SHEET - SDS**

**SECTION 1: IDENTIFICATION**

Product: Lithium metal anode/thionyl chloride cathode primary cylindrical cells including Tracer XMT series, ESA series and PIG series.

Manufacturer: Tracer Technologies, Inc.  
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Date Prepared: 9/19/23

**SECTION 2: HAZARDS IDENTIFICATION**

The lithium metal thionyl chloride cells described in this information sheet are hermetically sealed and, provided the cell physical integrity is not compromised or the batteries containing the cells are not subject to electrical, mechanical or thermal abuse, the cell ingredients are not hazardous. To remain non-hazardous, the batteries should not be exposed to abuse, such as short circuit, recharge, temperatures above their design temperature, puncture, immersion in water, forced over-discharge or other electrical, mechanical or thermal abuse conditions which would cause the cells to vent or explode.

In the event that the physical integrity of the cells is compromised by electrical, mechanical or thermal abuse, the hazard properties of the component ingredients are described in Section 3 herein.

In the opinion of Tracer Technologies, Inc., the lithium metal thionyl chloride cells described herein are "articles" under the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200(g)), revised in 2012, or under Regulation (EC) No. 1907/2006 ED, and therefore are exempted from the requirements thereof, including the requirement to supply a safety data sheet. The information provided in this Safety Data Sheet does not provide a warranty of any kind for product performance and is provided to the users of the lithium metal thionyl chloride cells manufactured by Tracer Technologies, Inc., including customers of Tracer Technologies, Inc., as a short description of some of our knowledge and experience with lithium metal thionyl chloride cells and is not to be relied upon as disclosing all hazards, compositions, first-aid measures, fire-fighting, accidental release, handling and storage, exposure controls, physical and chemical properties, stability and reactivity, toxicological, ecological, disposal, or transport information known now or possibly known in the future.

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

Cells contain less than 5% of lithium metal (CAS No. 7439-93-2) which is harmful if swallowed, is water reactive and can cause skin burns/eye damage.

Cells contain less than 50% thionyl chloride (CAS No. 7719-09-7) which is harmful if inhaled or swallowed and can cause severe skin burns and eye damage.

Cells contain less than 6% carbon black (CAS No. 7440-44-0).

Cells contain less than 5% aluminum chloride (CAS No. 7446-70-0) which is harmful if swallowed, is water reactive and can cause severe skin burns and eye damage.

Cells contain less than 3% lithium chloride (CAS No. 7447-41-8) which is harmful if swallowed, and can cause skin/eye.

Cells contain less than 1% fiberglass.

Balance of other components in cells is less than 75%, which includes steel, nickel, aluminum, and plastics.

No heavy metals, such as cadmium, hexavalent chromium, lead or mercury, are intentionally added during cell manufacture.

Note that the hazard information provided above is not applicable if the cells remain hermetically sealed and their physical integrity is not compromised.

#### **SECTION 4: FIRST AID MEASURES**

IN THE EVENT THAT CELLS VENT OR RUPTURE, EVACUATE PERSONNEL AND USE VENTILATION TO REMOVE FUMES.

**EMERGENCY FIRST AID PROCEDURES:** SEEK IMMEDIATE MEDICAL ASSISTANCE FOR FURTHER TREATMENT.

**EYE CONTACT:** FLUSH WITH COLD RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART. SEEK IMMEDIATE MEDICAL TREATMENT.

**SKIN CONTACT:** RINSE WITH LARGE AMOUNTS OF COLD RUNNING WATER. SEEK IMMEDIATE MEDICAL TREATMENT IF ACID-CAUSED BURNS DEVELOP.

**INHALATION:** REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN AND SEEK IMMEDIATE MEDICAL ATTENTION.

**INGESTION:** DRINK FLUIDS, ESPECIALLY WATER OR MILK. DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL TREATMENT.

#### **SECTION 5: FIRE FIGHTING MEASURES**

**FLASHPOINT:** N/A

**AUTO-IGNITION TEMP:** N/A

**FLAMMABLE LIMITS:** N/A

**EXTINGUISHER MEDIA:** DRY LITHIUM CHLORIDE, GRAPHITE POWDER, PYRENE G-1, LITH-X.  
**FIRE CLASS D.**

**SPECIAL FIRE FIGHTING PROCEDURES:** WHERE POSSIBLE COVER WITH DRY LITHIUM CHLORIDE OR LITH-X POWDER. APPLICATION OF WATER MAY CAUSE THE FORMATION OF FLAMMABLE HYDROGEN GAS BUT FLOODING FIRE-EFFECTED AREA WITH WATER TO TRY TO REDUCE FIRE TEMPERATURE BELOW LITHIUM METAL MELTING TEMPERATURE MAY BE EFFECTIVE. **DO NOT** USE MOIST SAND, CARBON DIOXIDE OR SODA ASH EXTINGUISHER. WEAR PROTECTIVE BREATHING APPARATUS DUE TO TOXIC GAS RELEASE. RELEASES FROM FIRE CAN CAUSE BURNS TO MUCOUS MEMBRANES, EYES AND EXPOSED SKIN.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** DO NOT SHORT-CIRCUIT, RECHARGE, OVERDISCHARGE, PUNCTURE, OR CRUSH CELL, OR EXPOSE CELL TO TEMPERATURES ABOVE MODERATE TEMPERATURES. HEATING ABOVE 354 F WILL LEAD TO MELTING OF LITHIUM AND REPRESENTS A SEVERE FIRE/EXPLOSION HAZARD. DO NOT EXPOSE VENTED OR LEAKING CELL TO WATER.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF CELL ELECTROLYTE SPILLED OR RELEASED:** DO NOT BREATHE VAPORS OR TOUCH LIQUID WITH BARE HANDS. EVACUATE AREA OF PERSONNEL NOT TRAINED TO HANDLE CHEMICAL SPILLS OR RELEASES AND USE VENTILATION TO REMOVE FUMES.

**CELL WASTE DISPOSAL METHODS:** NEUTRALIZE SPILL WITH SODA LIME, SEAL LEAKING CELL WITH SODA LIME IN PLASTIC BAG AND DISPOSE OF AS HAZARDOUS WASTE IN ACCORDANCE WITH STATE / FEDERAL REGULATIONS.

## **SECTION 7: HANDLING AND STORAGE**

**PRECAUTIONS TO BE TAKEN FOR CELL SAFE HANDLING/STORAGE:** DO NOT SHORT-CIRCUIT, DO NOT EXPOSE TO TEMPERATURES ABOVE MODERATE, DO NOT CHARGE, SHORT CIRCUIT, OVERDISCHARGE, PUNCTURE, OR CRUSH.

**OTHER:** DO NOT STORE CELL IN HIGH HUMIDITY OR TEMPERATURE ENVIRONMENT FOR EXTENDED PERIODS OF TIME. ALWAYS STORE CELL IN ORIGINAL SHIPPING CONTAINER.

## **SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION**

Unless subjected to electrical, mechanical or thermal abuse, under normal cell operating conditions, including electrical discharge, hermetically-sealed lithium metal thionyl chloride cells are designed not to release component ingredients.

**RESPIRATORY PROTECTION:** ACID GAS FILTER MASK.

**PROTECTIVE GLOVES:** BUTYL OR PVC RUBBER GLOVES.

**EYE PROTECTION:** CHEMICAL WORKER SAFETY GLASSES.

**VENTILATION TO BE USED:** LOCAL EXHAUST.

**OTHER PROTECTIVE CLOTHING / EQUIPMENT:** CHEMICAL APRON.

**HYGIENIC WORK PRACTICES:** AVOID UNNECESSARY CONTACT.

## **SECTION 9: PHYSICAL AND CHEMICAL CHARACTERISTICS**

Unless subjected to electrical, mechanical or thermal abuse, under normal cell operating conditions, including electrical discharge, physical and chemical characteristics of component ingredients are not an issue with hermetically-sealed lithium metal thionyl chloride cells because they are designed not to release component ingredients.

**ELECTRICAL CONFIGURATION:** SINGLE CELL NOMINAL 3.6 VDC.

**OTHER:** CELL CONTAINS LITHIUM METAL AND THIONYL CHLORIDE WHICH ARE BOTH WATER REACTIVE. THIONYL CHLORIDE HYDROLYSES WITH WATER TO FORM SO<sub>2</sub> AND HCl GASES AND ACIDIC LIQUID WASTE; THIS REACTION CAN OCCUR WITH THE MOISTURE IN AIR.

**SECTION 10: STABILITY AND REACTIVITY**

**STABILITY:** STABLE

**CONDITIONS TO AVOID:** TEMPERATURES ABOVE MODERATE AMBIENT TEMPERATURES. HIGH HUMIDITY FOR EXTENDED PERIODS.

**INCOMPATIBILITY:** N/A

**HAZARDOUS CHEMICAL POLYMERIZATION:** WILL NOT OCCUR.

**OTHER:** DO NOT EXPOSE VENTED CELL TO WATER. BOTH LITHIUM METAL AND THIONYL CHLORIDE ARE WATER REACTIVE. THIONYL CHLORIDE HYDROLYSES WITH WATER TO FORM SO<sub>2</sub> AND HCl GASES AND ACIDIC LIQUID WASTE; THIS REACTION CAN OCCUR WITH THE MOISTURE IN AIR. LITHIUM REACTS WITH WATER TO FORM HYDROGEN GAS.

**SECTION 11: TOXICOLOGICAL INFORMATION**

Unless subjected to electrical, mechanical or thermal abuse, under normal cell operating conditions, including electrical discharge, hermetically-sealed cells are designed not to release component ingredients.

*ACUTE TOXICITY: THIONYL CHLORIDE*

EYE CONTACT: CORROSIVE

SKIN CONTACT: CORROSIVE (MAY BE ABSORBED THROUGH SKIN)

INHALATION: CORROSIVE. TOXIC WITH LC<sub>50</sub> (RAT) = 500 ppm (1 hr.)

INGESTION: CORROSIVE

**SECTION 12: ECOLOGICAL INFORMATION**

Unless subjected to electrical, mechanical or thermal abuse, under normal cell operating conditions, including electrical discharge, hermetically-sealed cells are designed not to release component ingredients.

*AVOID RELEASE OF CELL CHEMICAL COMPONENTS OR LEAK/VENT WASTE PRODUCTS INTO MARINE OR FRESHWATER ENVIRONMENTS.*

**SECTION 13: DISPOSAL CONSIDERATIONS**

**PROPER SHIPPING NAME:** LITHIUM METAL BATTERIES FOR DISPOSAL

**UN NUMBER:** UN3090

**HAZARD CLASSIFICATION:** ORM-C

**LABELS REQUIRED:** 1) MISCELLANEOUS CLASS 9  
2) LITHIUM METAL BATTERIES FOR DISPOSAL

**WASTE DISPOSAL CODE:** D003

**OTHER:** ALL LITHIUM METAL THIONYL CHLORIDE CELLS AND BATTERIES SHOULD BE DISPOSED OF BY A PROPER DISPOSAL FACILITY IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS. SHIPMENT OF LITHIUM METAL CELLS IS SUBJECT TO REQUIREMENTS OF 49 CFR 173.185.

**SECTION 14: TRANSPORT INFORMATION**

**PROPER SHIPPING NAME:** LITHIUM METAL BATTERY

**UN NUMBER:** UN3090

**HAZARD CLASSIFICATION:** MISCELLANEOUS CLASS 9

**LABELS REQUIRED:** MISCELLANEOUS CLASS 9

**OTHER:** CARGO AIR OR TRUCK TRANSPORTATION ONLY; SHIPMENT OF LITHIUM METAL CELLS SUBJECT TO REQUIREMENTS UNDER 49 CFR 173.185.

**SECTION 15: REGULATORY INFORMATION**

Tracer Technologies, Inc., considers all lithium metal thionyl chloride cell and batteries which it manufactures are defined as "articles" (as described in Section 2 herein) and are thus exempt from the requirements of the applicable regulations for "non-article" products.

THIONYL CHLORIDE CONTAINED IN CELL IS CONSIDERED HAZARDOUS UNDER OSHA (29 CFR 1920.1200).

SHIPMENT OF LITHIUM METAL CELLS IS SUBJECT TO REQUIREMENTS OF 49 CFR 173.185.

SHIPMENT OF LITHIUM METAL CELLS IS SUBJECT TO REQUIREMENTS OF IATA.

**CLASSIFICATION:** LITHIUM METAL BATTERY (UN3090)

**LITHIUM CONTENT:** UP TO 12 GRAMS LITHIUM PER CELL (7439-93-2)

**OTHER:** THIONYL CHLORIDE (7719-09-7)

**SECTION 16: OTHER INFORMATION**

Do not take apart or otherwise dis-assemble, or cause to dis-assemble, any lithium metal thionyl chloride cell.