

LITHIUM METAL CELLS AND BATTERIES

SAFETY DATA SHEET - MSDS

SECTION 1: IDENTIFICATION

Product: Lithium metal anode/thionyl chloride cathode primary cylindrical cells with part numbers 86300005, 86300245, and 86300330.

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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 batteries or 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 batteries and their component 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 and batteries 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 batteries 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 and batteries 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 or battery manufacture.

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

SECTION 4: FIRST AID MEASURES

IN THE EVENT THAT CELLS/BATTERIES 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: COVER WITH DRY LITHIUM CHLORIDE OR LITH-X POWDER. **DO NOT** USE WATER, MOIST SAND, CARBON DIOXIDE OR SODA ASH EXTINGUISHER - WEAR PROTECTIVE BREATHING APPARATUS.

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: ACCIDENTIAL 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/battery 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/battery 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 SO₂ 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 SO₂ 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/battery 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 LC₅₀ (RAT) = 500 ppm (1 hr)

INGESTION: CORROSIVE

SECTION 12: ECOLOGICAL INFORMATION

Unless subjected to electrical, mechanical or thermal abuse, under normal cell/battery 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 (UN3091 if contained in or packed with equipment)

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 or battery.

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