

Material Safety Data Sheet

Menara 80

SECTION 1. IDENTIFICATION

Manufacturer

Name of Company Romeo Systems Inc.
Address 4380 Ayers Ave, Vernon, CA 90058
Telephone 888.331.7917 | 323.675.2180
Tech Support support@romeopower.com

Product

Product Identifier Lithium-Ion Battery Pack (or, Lithium-Ion Secondary Battery Pack)
Model Names Romeo Power Battery Pack (P00018686)

Emergency Contact CHEMTREC Customer Contract Number 814871
 800-424-9300 (US and Canada)
 +1703-741-5970 (International and Maritime)

SECTION 2. HAZARD IDENTIFICATION

Substance Identification

Substance Lithium-Ion Battery
CAS Number Not Specified
UN ID UN 3480, Lithium-Ion Batteries

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition Positive Electrode: Lithium nickel cobalt aluminum oxide 20-50wt%
 Negative Electrode: Carbon 10-30wt%
 Electrolyte: Organic Electrolyte (mainly composed of one or more of the following: Ethylene carbonate, ethyl methyl carbonate, dimethyl carbonate) 5-20wt%
 Enclosure: Anodized Aluminum 6061 T6 temper

Hazardous and Toxicity

Class Name Not considered "hazardous per 29 CFR 1910.1200"
Hazard It may cause heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.
Toxicity Vapor generated from burning batteries may make skin, eyes and throat irritated.

SECTION 4. FIRST-AID MEASURES

The product contains organic electrolyte. In case of electrolyte leakage from the battery, actions described below are required.

Eye Contact	Flush the eyes with plenty of clean water for at least 15 minutes immediately without rubbing. Seek medical treatment immediately. If appropriate procedures are not taken, this may cause an eye irritation or damage.
Skin Contact	Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
Inhalation	Leave the affected area immediately. Have the affected person blow his / her nose and gargle some water. Seek medical attention if necessary or consult a physician.
Ingestion	Although highly unlikely, but if it does occur, have the affected person drink plenty of water to dilute the chemicals. Do NOT induce vomiting. Call the National Battery Ingestion Hotline at 202-625-3333 (24 hr. / day) for advice and procedures to treat the ingestion of battery chemicals

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Method Since vapor generated from burning batteries may make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

Fire Extinguishing AgentPlenty of water and alcohol-resistant foam are effective.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Measures for Electrolyte Leakage from the Battery:

- 1.Place material into suitable containers.
- 2.Take up with absorbent cloth.
- 3.Contact local fire/police department.

SECTION 7. HANDLING AND STORAGE

When packaging the battery modules/pack, do not allow battery terminals to contact each other or contact with other metals. Be sure to package battery modules/packs by providing partitions in the packaging box or in a separate plastic bag so that battery modules/packs are in contact with each other. (1)(2)(3)

Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation. (1)(2)(3)

Do not let water penetrate into packaging boxes during their storage and transportation The battery will be stored at room temperature, charged to about 30% of capacity.

Do not store the battery in places of the high temperature exceeding 35 deg. C or under direct sunlight or in front of a heat source. Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, water droplets or to froze conditions.

Ensure that battery modules/packs are packaged in such a way as to prevent short circuits under conditions that might be normally encountered in transportation. (1)(2)(3)

Please avoid storing the battery module/pack in the places where it is exposed to static electricity so that no damage will occur to the protection circuit of the battery pack.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION (in case of electrolyte leakage from the battery)

Acceptable Concentration Not specified in ACGIH. (4)

Facilities	Provide appropriate ventilation system such as local ventilator in area of storage.
Protective Clothing	Gas mask for organic gases, safety goggles, safety gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Lithium-ion rechargeable cells are mechanically attached to an insulated aluminum base structure, with plastic components to assist with cell retention
Dimensions (mm)	Length : 900 Width : 637 Height : 715
Nominal Voltage (V)	Cell : 3.69 Module: 84.87 Pack : 678.96
Description	Solid
Color	Not available
Odor	Odorless
Odor threshold	Not available
pH	Not available
Melting point/freezing point	Not available
Initial boiling point and range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Upper/lower flammability or explosive limits	Not available
Vapor pressure	Not available
Solubility (ies)	Insoluble
Vapor density	Not available
Relative density	Not available
Partition coefficient n-octanol/water	Not available
Auto ignition temperature	Not available
Decomposition temperature	Not available

Viscosity	Not available
Explosive properties	Not available
Oxidizing properties	Not available
Molecular weight	Not available
Viscosity	Not available

SECTION 10. STABILITY AND REACTIVITY

Since batteries utilize a chemical reaction, they are actually considered a chemical product. As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc., are not maintained within the specified ranges, the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

SECTION 11. TOXICOLOGICAL INFORMATION (in case for electrolyte leakage from battery)

Acute Toxicity	Oral (rat) LD50 >2g/kg (estimated)
Irritation	Irritating to eyes and skin
Mutagenicity	Not specified
Chronic Toxicity	Not specified

SECTION 12. ECOLOGICAL INFORMATION (section heading must appear; all content is optional)

Should the worn-out battery be disposed of in land, the battery case may corrode and leak electrolyte. We have no historical ecological information.

Heavy Metal in Battery Mercury (Hg) and Cadmium (Cd) are neither contained nor used in battery


SECTION 13. DISPOSAL CONSIDERATIONS (Precautions for recycling)

When the battery is worn out, dispose of it under the ordinance of each local government or the law issued by the relevant government. Disposal of the worn-out battery may be subjected to Collection and Recycling Regulation.

SECTION 14. TRANSPORT INFORMATION

Romeo Power Battery Packs are designed and manufactured with the intent to be in accordance with the provisions of the IATA Dangerous Goods Regulations (DGR); the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air; the UN Manual of Tests and Criteria (UN 38.3) as well as the US 49 CFR Part 178 Subpart M – Testing of Non-Bulk Packaging's and Packages. Batteries are suitable by all modes of transportation if shipping regulations for each mode are strictly followed.

Battery Module Dangerous Good Information:

UN ID NUMBER	UN 3480	Hazard Label Required 
DOT Proper Shipping Name	Lithium Ion Batteries	
Hazard Class	Class 9	
Packing Group	N/A	
Marine Pollutant	NO	

Dangerous Goods Regulations Lithium-Ion Battery Shipping Criteria Detail:
Romeo Power Li-ion battery pack/module

Part number: P00018686

Parameter	Module	Pack
Energy in Watt hours	n/a	78,350
Net Weight per package (kg)	n/a	510
Net Weight per package (lbs)	n/a	1124

Note: The housing the battery pack and its control technology is designed and **will be** tested as a UN approved performance orientated shipping package for the transportation of dangerous goods in all modes of transportation. The designated internal, secondary, and tertiary packaging configuration assigned satisfies the requirements and guidelines for acceptance in all modes.

Air Freight

DGR Classification: UN3480, Lithium-Ion Batteries, Class 9, PI 965, Section IA

Net Weight Limits per package: Cargo Aircraft Only (CAO) = 35kg Net per package or less

This pack exceeds net quantity of 35 kg. A99 Special Permit required to ship via AIR.

Ground

- Driver Qualification - A Commercial Driver’s License (CDL) or CDL with a Hazmat Endorsement are NOT required to transport Romeo Power products over the highway within the United States.
 - Consult Federal and State regulations to determine if your vehicle or combination vehicle (truck and trailer) requires a driver with a CDL, the type of CDL, or any specialized permits. Requirements can vary from State to State in the USA.
- Shipping Papers – Modules must be declared on all ground shipping papers/Bill of Lading (BOL) as “HM” or ‘Hazardous Materials’ [1] per U.S. regulations and must be available in the driver side pocket of the vehicle to the authorities during transit.
 - Consult the regulations for the mandated retention time.

[1] See 49 CFR 383.93 (b) (4); 49 CFR 383.5, definitions: “Hazardous Materials”; 49 CFR 172.504 table 2 “class 9”

Note: If returning batteries for warranty work please refer to 49 CFR Part 173.185 Lithium cells and batteries; paragraph (f) Damaged, defective, or recalled cells or batteries.

Emergency Response

Emergency Contact **CHEMTREC Customer Contract Number 814871**
800-424-9300 (US and Canada)
+1703-741-5970 (International and Maritime)

Refer to current Emergency Response Guides for; DOT (Land/Rail), IMDG (Ocean Transport), IATA-ICAO (Air Transport).

Fire - Refer to PHMSA Emergency Response Guidebook (ERG), Guide Section 147.

SECTION 15. REGULATORY INFORMATION

The transport of rechargeable Lithium-Ion batteries is regulated by various bodies, (IATA, IMDG, US-DOT) that follow the United Nations “Recommendations on the Transport of Dangerous Goods.

Regulatory Requirements IAW:

ICAO Technical Instructions for the Safety Transport of Dangerous Goods by Air IMO IMDG

IATA Dangerous Goods Regulations (DGR)

US Department of Transportation DOT (49 CFR 100-185), (USA)

OSHA hazard communication standard (29 CFR 1910.1200) – Classed as Non-hazardous

Safety

The Romeo Power battery pack/module has been designed and manufactured under a quality management program as described under the regulations and does not possess an onboard battery management system (BMS), but utilizes an external junction box during operation, and is fused during transport which are means to prevent accidental activation and short circuits, incorporates a safety venting device, and does not allow reverse current flow.

SECTION 16. OTHER INFORMATION

References

- (1) UN (United Nations): Recommendations on the Transportation of Dangerous Goods Model Regulations Sixteenth revised edition
- (2) IATA (International Air Transport Organization): Dangerous Goods Regulations 54th Edition, Effective 1 January 2013
- (3) IMO (International Maritime Organization): International Maritime Dangerous Goods (IMDG) Code 2013 Edition (Amendment 35-10)
- (4) Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) 1999 American Conference of Governmental Industrial Hygienists (ACGIH)