SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006

Section 1: Identification of the Substance/Preparation and of the Company/Undertaking

Product Name:	Lithium-Ion Battery Cells
Product Codes:	ANR26650-m1B (Start Pac Li2000QC, Li2600QC, Li2700QC, Li2800QC, PRO) APR18650-m1B (Start Pac ONE) AER32140-m2A1 APR18300-m1B2 AER18650-m2A2
Product Use:	Cells and cell packs
Restriction on Use:	For use as a battery-based power supply only. Do not rupture or expose solution inside of the cells
Synonyms:	Lithium Ion Battery Cell Lithium Werks (China)
Company Name	No. 8 beihai road, XinBei district
Address:	ChangZhou JiangSu Province
Phone Number:	+86 (0519) 8576 5092
Fax Number:	+86 (0519) 8676 5152
24-hour Emergency:	+86 139 2107 4676
Transportation Emergencies:	+86 139 2107 4676

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Section 2: Hazards Identification

Hazard Classification(s):	Not applicable under normal use in accordance with United Nations Conference on Environment and Development (UNCED) and Occupational Safety & Health Administration (OSHA) 29 CFR 1910.1200
Signal Word:	Environment and Development (UNCED) and Occupational Safety & Health Administration (OSHA) 29 CFR 1910.1200
Hazard Statements:	Not applicable under normal use in accordance with United Nations Conference on Environmental and Development (UNCED) and Occupational Safety & Health Administration (OSHA) 29 CFR 1910.1200
Precautionary Statement(s):	P202: Do not handle until all safety precautions have been read and understood P210: Keep away from heat/sparks/open flames/hot surface-No smoking P370: In case of fire: Use carbon dioxide, dry chemical or water extinguisher P402: Store in a dry place P410: Protect from sunlight P501: Dispose of batteries in accordance with applicable hazardous waste regulations

Protective Clothing	NFPA Rating (USA)	EC Classification	WHMIS (Canada)	Transportation	GHS Hazard Symbol
Not required with normal use		Not Classified as Hazardous	Not applicable with normal use	See Section 14	Not applicable with normal use

Preparation Hazards and Classification:	Not classified as dangerous or hazardous with normal use. The cell should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful. European Communities (EC): This product is not classified as hazardous according to Regulation (EC) No. 1272/2008. This product contains dangerous ingredients however, there is no expected release during use of the product and there is a barrier preventing exposure of user and the environment.
Appearance, Color and odor:	Solid object with no odor
Primary Route(s) of	These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact.
Potential Health Effects:	ACUTE (short term): see Section 8 for exposure controls In the event that this cell has been ruptured, the electrolyte solution contained within the cell would be corrosive and can cause burns to skin and eyes.
Inhalation:	Inhalation of materials from a sealed cells is not an expected route of exposure. Vapors or mists from a ruptured cell may cause respiratory irritation.
Ingestion:	Swallowing of materials from a sealed cell is not an expected route of exposure. Swallowing he contents of an open cell can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.
Skin:	Contact between the cell and skin will not cause any harm. Skin contact with contents of an open cell can cause severe irritation or burns to the skin.

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Eye:	Contact between the cell and the eye will not cause any harm. Eye contact with contents of an open cell cause severe irritation or burns to the eye.
CHRONIC (long term):	See Section 11 for additional toxicological data
medical conditions aggravated by exposure	Not available
interactions with other chemicals	Immersion in high conductivity liquids may cause corrosion and breaching of the cell enclosure. The electrolyte solution inside of the power cells may react with alkaline (basic) materials and present a flammable hazard.
Potential Environmental Effects:	Not available

Section 3: Composition / Information on Ingredients

As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use.

USA: This cell is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Canada: This is not a controlled product under WHMIS. This product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

Cell component	Chemical Name	CAS #	EINECS #	Concentration range in electrolyte (w/w %)	Mass range in cell (g/g %)
Electrolyte salt	Lithiumhexafluorophosphate	21324-40-3	244-334-7	10 – 20	1 – 5
	Lithuim bis-trifluoromethanesulfonimide	90076-65-6	415-300-0	1 - 5	0.1 - 1
Electrolyte solvents	Includes one or more of the following:				
	Ethylene Carbonate	96-49-1	202-510-0		
	Propylene Carbonate	108-32-7	203-572-1		
	Diethyl Carbonate	105-58-8	203-311-1	80 - 90	10 - 20
	Dimethyl Carbonate	616-38-6	210-478-4		
	Ethyl Methyl Carbonate	623-53-0	Not Listed		
	1,3 – Propanessultone	1120-71-4	214-317-9		
	Ethyl Propionate	105-37-3	203-291-4		

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Section 4: First Aid Measures

Inhalation:	If contents of an opened cell are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advise.
Eye Contact:	Contact with the contents of an opened cell can cause burns. If eye contact with contents of an opened cell occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 15 minutes while holding the eyelids open. Neutral saline solutions may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.
Skin Contact:	Contact with the contents of an opened cell can cause burns. If skin contact with contents of an open cell occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 15 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Ingestion:	Contact with the contents of an opened cell can cause burns. If ingestion of contents of an open cell occurs, NEVER give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. Have the victim rinse their mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting, occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency facility.

Section 5: Fire Fighting Measures

Flammable Properties:	Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (>150 °C (302 °F)), when damaged or abused (e.g., mechanical damage or electrical overcharge). Burning cells can ignite other batteries in proximity.
Suitable extinguishing Media:	Small fires – Dry chemical, CO_2, water spray or regular foam. Large fires – Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.
Unsuitable extinguishing Media:	Not Applicable
Explosion Data:	Not Applicable
Sensitivity to Mechanical Impact:	Extreme mechanical abuse will result in rupture of the individual battery cells
Sensitivity to Static Discharge:	Electrostatic discharges imposed directly on the spilled electrolyte may start combustion.
Specific Hazards arising from the Chemical:	The interaction of water or water vapor and exposed lithium hexafluorophosphate ($LIPF_6$) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolytes may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.
Protective Equipment and precautions for firefighters:	Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Fight fire from a safe distance.

NFPA:
Health: 0
Flammability: 1
Instability: 0

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Section 6: Accidental Release Measures

Personal Precautions:	As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75') in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering
Environmental Precautions:	Wear adequate personal protective equipment as indicated in Section 8. Prevent material from contaminating soil and from entering sewers or waterways.
Methods for Containment:	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Methods for Clean-up:	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

Section 7: Handling and Storage

Handling/Transportation:	Do not open, dissemble, crush or burn cell. Do not expose cell to temperatures outside the range of -40°C to 80°C.
Storage:	Store cell in a dry location. To minimize any adverse effects on battery performance it is recommended that the cells be kept at room temperature (20°C+/-10°C) and humidity (<60%) Elevated temperatures can result in shortened cell life. Keep out of reach of children.

Section 8: Exposure Controls/Personal Protection

Exposure Limit Values:	Airborne exposures to hazardous substances are not expected when product is used for its intended purpose.
Engineering Controls:	Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fume and vapor.
Personal Protection:	Not necessary under normal conditions
Respiratory Protection:	Not necessary under normal conditions
Skin Protection:	Not necessary under normal conditions. Wear neoprene or natural rubber gloves if handling an open or leaking cell.
Eye Protection:	Not necessary under normal conditions. Wear safety glasses if handling and open or leaking cell.
Other Protective Equipment:	Not necessary under normal conditions. If exposure to the electrolyte solution is expected due to non-routine tasks, a safety shower and eye-wash fountain readily available in the immediate work area.
Hygiene Measures:	Do not eat, drink or smoke in work areas. Maintain good housekeeping.

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Section 9: Physical and Chemical Properties

Physical State:	Solid	Vapor Pressure (mm Hg @ 20°C):	Not applicable
Appearance:	Cell	Vapor Density:	Not applicable
pH:	Not applicable	Solubility in Water:	Insoluble
Relative Density:	Not available	Water / Oil distribution coefficient	Not applicable
Boiling Point:	Not applicable	Odor Type:	Odorless
Melting Point:	Not applicable	Odor Threshold:	Not applicable
Viscosity:	Not applicable	Evaporation Rate:	Not applicable
Oxidizing Properties:	Not applicable	Auto Ignition Temperature (°C):	Not applicable
Flash Point and Method (°C)	Not applicable	Flammability Limits (%):	Not applicable
Octanol/Water Partition Coefficient	Not applicable	Decomposition Temperature	90°C

Section 10: Stability and Reactivity

Stability:	Sealed and normally functioning power cells are considered stable.
Conditions to Avoid:	Avoid exposing the cell to fire or temperatures above 80°C. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.
Incompatible Materials:	Do not immerse in water or other high conductivity liquids.
Hazardous Decomposition Products:	This material may release toxic fumes if burned or exposed to fire. Breaching of the cell enclosure may lead to generation of hazardous fumes which may include extremely hazardous hydrofluoric acid.
Possibility of Hazardous Reactions:	Not available

Section 11: Toxicology Information

Acute Toxicity Data:	Acute oral, dermal and inhalation toxicity data are not available for this article
Other Toxicity Data:	Not applicable
Irritation:	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Corrosive:	Not applicable
Sensitization:	Not applicable
Neurological Effects:	Not applicable
Genetic Effects:	Not applicable
Reproductive Effects:	Not applicable
Developmental Effects:	Not applicable
Target Organ Effects:	Not applicable
Carcinogenicity:	Normal safe handling of this product will not result in exposure to substances that are considered human carcinogens by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Government Industrial Hygienists), OSHA (Occupational Safety and Health Administration) or NTP (National Toxicology Program).

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Section 12: Ecological Information

Ecotoxicity:	Not applicable
Mobility:	Not applicable
Persistence and Degradability:	Not readily biodegradable
Bio accumulative Potential:	Not applicable
Other adverse effects:	Solid cells released into the natural environment will slow degrade and may release harmful or toxic substances. Cells are not intended to be released into water or on land but should be disposed or recycled according to local regulations.

Section 13: Disposal Considerations:

Waste Disposal Method:	Cell recycling is encouraged. Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.
USA:	In the United States, dispose of in accordance with local, state and federal laws and regulations. Consult universal/hazardous waste regulations for further information regarding disposal of spent batteries. If a battery is leaking/broken open, consult hazardous waste regulations under US Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA). Also, consult state and local regulations for further disposal requirements.
Canada:	Dispose of in accordance with local, provincial and federal laws and regulations.
EU:	Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Section 14: Transport Information:

Lithium Werk's Lithium-ion cells and batteries are designed to comply will all applicable shipping as prescribed by industry and legal standards which includes compliance with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods Regulations 64th edition (2023) and applicable U.S. DOT regulations for the safe transport of lithium-ion batteries and the International Maritime Dangerous Goods Code 39-18. Each of the listed cells in Section 1 has either passed the UN Manual of Tests and Criteria Part III Subsection 38.3 or they belong to prototype and low production, for which the UN38.3 tests are not required by the regulations listed above.

In the US, shipments of lithium ion cells and batteries are classified as Class 9, UN3480 or UN3481 if shipped when the batteries are contained in or packed with equipment, by the U.S. Hazardous Materials Regulations (HMR). Packaging, markings and documentation requirements are defined in Title 49 of the Code of Federal Regulations (CFR), Section 173.185 of the U.S. HMR.

International shipments of lithium-ion cells and batteries are generally classified as Class 9, UN3480 or UN3481 if shipped when the batteries are contained in or packed with equipment, by the Recommendation on the Transport of Dangerous Goods Model Regulations of United Nations, International Civil Aviation Organization (ICAO) and the International Maritime Dangerous Goods (IMDG) Code. Packaging markings and documentation requirements are defined in the International Air Transport Association (IATA) Dangerous Goods Regulations (DGR) PI965, PI966, PI967 or PI910 and P903, LP903 and P910 of the IMDG Code. Excepted cells and batteries are allowed to be transported internationally without UN-certified packaging when meeting ICAO, IATA, IMDG/IMO and 49 CFR and in some circumstances, markings are simplified, too. But they must conform to other requirements as stipulated in PI965, PI966 or PI967 of the IATA DGR and Special Provision 188 under the Recommendations on the Transport of Dangerous Goods Model Regulation of United

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Nations and IMDG Code. Air shipping of lithium battery cells when they are not UN38.3 tested, i.e. prototypes and low production cells, must first get the Competent Authority's approval of the originating country per SP A88 of IATA's DGR.

The following batteries listed are in excess of 100 watt-hours. Refer to relevant transportation guideline material for further information.

ANR26650-m1B (Start Pac Li2000QC, Li2600QC, Li2700QC, Li2800QC, PRO)
APR18650-m1B (Start Pac ONE)

Transportation	UN Number	Proper shipping name	Hazard Class	Packing Group	Packing Instructions
IATA	UN3480	Lithium ion batteries	9	Not specified	965 / Section 1A
DOT	UN3480	Lithium ion batteries	9	Not specified	
IMO-IMDG	UN3480	Lithium ion batteries	9	Not specified	965 / Section 1A

Section 15: Regulatory Information

USA

TSCA Status:	All ingredients in the product are listed on the TSCA inventory.
SARA Title III:	None
Sec. 302:	None
Sec. 304:	None
Sec. 311/312:	None
Sec. 313:	None
CERCLA RQ:	None
California Prop 65	This product complies with the requirements of California Proposition 65.

Canada

Controlled Products Regulations	This has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations
WHMIS Classification	Not Controlled
New Substance Notification Regulations	Lithium hexafluorophosphate is listed on the Non-Domestic Substances List (NDSL). All other ingredients in the product are listed, as required, on Canada's Domestic Substances List
National Pollutant Release Inventory (NRPI) Substances	This product does not contain in any NPRI chemicals.

European Union

Classification for the Substances/Preparation	This product is not classified as hazardous according to Regulation (EC) No. 1272/2008. Keep of the reach of children

International

IATA	This product meets all IATA Dangerous Goods Regulations (DGR) – up to 64th edition (2023)
IMDG Code	This product meets all requirements of IMDG Code up to 39-18

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Section 16: Other Information

Revision Summary:

May 10, 2018:
Release of document
Dec 29, 2018
In Section 14: change IATA's DGR from 59th to 60th
Jan 6, 2020:
Release of document
Feb 27, 2020:
In Section 14: change IATA's DGR from 60th to 61st
Mar 30, 2020:
Updated company logo
Jan 6, 2021:
In Section 14: change IATA's DGR from 61st to 62nd
In Section 15: change IATA's DGR from 61st edition (2020) to 62nd edition (2021)
Jan 1, 2022:
In section 14 and 15: Updated to the 63rd (2022) addition of IATA's Dangerous Goods Regulations
Jan 1, 2024:
In Section 14 and 15: Updated to the 64th (2023) addition of IATA's Dangerous Goods Regulations

Added new cell variants to the product code area