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CERTIFICATE OF TESTING - FOR SAFE TRANSPORT

Li-16 VARLEY LITHIUM MOTORSPORT RECHARGEABLE BATTERY

1) PRODUCT

Product: Li-16 Lithium Rechargeable Battery
Trade name: **VARLEY LITHIUM MOTORSPORT BATTERY**

Chemistry: Lithium Iron Phosphate ($LiFePO_4$)

Cell Type: 26650 Cylindrical		Number of Cells contained:	28 Cells
Minimum Cell Capacity:	2300mAh	Minimum Battery Capacity:	16.1 Ah
Nominal Cell Voltage:	3.2 Volt	Nominal Battery Voltage:	12.8 Volts
Individual Cells:	7.36 Wh (Watt Hours)	Overall Battery:	206.08 Wh (Watt Hours)

2) TESTS COMPLETED

Tested in accordance with the "UN Manual of Tests and Criteria", Part III, sub-section 38.3 (5th Revised Edition, Amd 1, Effective Jan 2013).

These lithium-ion batteries (when packed alone) are classified for international shipment as: Class 9 Dangerous Goods, UN 3480, LITHIUM ION BATTERIES, Packing Group II, Tunnel Code E, under the "United Nations Recommendations on the Transportation of Dangerous Goods".

Name of Test	Test Result
Altitude Simulation (38.3 Test T1)	Batteries subjected to pressure of 11.6kPa for 6 hours at 20 ±5°C. No mass loss, no leakage, no venting, no disassembly, no rupture, no fire. OCV remained within prescribed limits. The product conforms to the requirements of the standard.
Thermal Cycling Test (38.3 Test T2)	Batteries subjected to temperature cycling between +75 ±2°C and -40 ±2°C. No mass loss, no leakage, no venting, no disassembly, no rupture, no fire. OCV remained within prescribed limits. The product conforms to the requirements of the standard.
Vibration Test (38.3 Test T3)	Batteries subjected to cyclic sinusoidal waveform with a logarithmic sweep of vibration between 7Hz and 200Hz. Test were repeated in 3 mutually perpendicular axes. No mass loss, no leakage, no venting, no disassembly, no rupture, no fire. OCV remained within prescribed limits. The product conforms to the requirements of the standard.
Shock Test (38.3 Test T4)	Batteries subjected to 3 half sine 6ms shocks of peak acceleration of $150g_n$ per setup. Test were repeated in 3 mutually perpendicular axes, and in both directions. (18 shocks in total) No mass loss, no leakage, no venting, no disassembly, no rupture, no fire. OCV remained within prescribed limits. The product conforms to the requirements of the standard.
External Short Circuit Test (38.3 Test T5)	Batteries at 55 ±2°C were subjected to a short circuit resistance of 0.1 ohm. External temperature did not exceed 80°C. (ie significantly less than the UN requirements limit of 170°C) No disassembly, no rupture, no fire. The product conforms to the requirements of the standard.
Impact / Crush Test (38.3 Test T6)	Individual cells within the product were subjected to impact and crush forces as specified in the standard. External temperature did not exceed 170°C. No disassembly, no fire. The product conforms to the requirements of the standard.
Over Charging Test (38.3 Test T7)	Batteries were subjected to an external power supply regulated to 22 volts and twice the manufacturer's recommended maximum continuous charge current. No disassembly, no fire. The product conforms to the requirements of the standard.
Forced Discharge Test (38.3 Test T8)	Individual cells within the product were subjected to an external power supply regulated to 12 volts, and the manufacturer's specified maximum discharge current. No disassembly, no fire. The product conforms to the requirements of the standard.

Typical corrugated cardboard packaging (coded 4G) for shipment of these batteries, have been tested at 23 ±2°C and 50% ±2% relative air humidity, in accordance with ADR2011 and IMDG German code , Section 6.1.5
- Flat impact "Drop tests" were performed on 4 sides, with No damaged
- Corner impact "Drop tests" resulted in minor corner compression (25mm), but not torn.

None of the samples tested showed any significant damage, nether was any leakage found on inner packaging.
There was no deformation which could impair the strength, or cause instability when stacked.