

LITACELL

Energy and Performance

Large format lithium-ion cells for high performance applications

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LITACELL lithium-ion cell technology exhibits an outstanding combination of leading-edge cycle and calendar life, unique safety features and a superior quality level based on the well-proven LITARION® electrodes and the unparalleled SEPARION® ceramic separator membrane.

Due to its excellent performance, safety features and quality, LITACELL is the most suitable product for demanding applications such as stationary and mobile energy storage systems or electric vehicles.

LITACELL Key Advantages

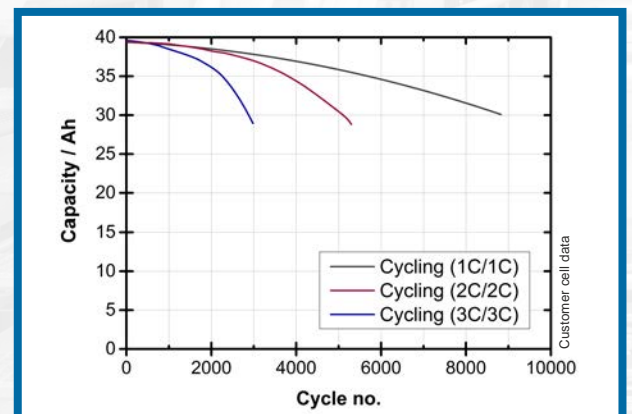


TECHNOLOGY

- › High energy density pouch-cell, also suitable for the medium-power range
- › LITARION® NMC cathode and LITARION® graphite anode
- › SEPARION® ceramic separator

SUPERIOR CYCLE AND CALENDAR LIFE

- › LITARION® electrodes and SEPARION® ceramic separator inside
- › 9000 full cycles (100 % DOD, 1C/1C)
- › Exceeding 400,000 miles in „Artemis“ driving cycle (extrapolated numbers; 125,000 miles have been demonstrated so far)
- › Over 20 years lifetime, depending on operating conditions



EXTRAORDINARY SAFETY

- › SEPARION® ceramic separator inside
- › Highest safety for lithium-ion battery cells in all relevant abuse scenarios
- › EUCAR hazard level 3 or better

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Proven technology for high performance applications

HIGH QUALITY: DESIGN AND COMPONENTS MADE IN GERMANY

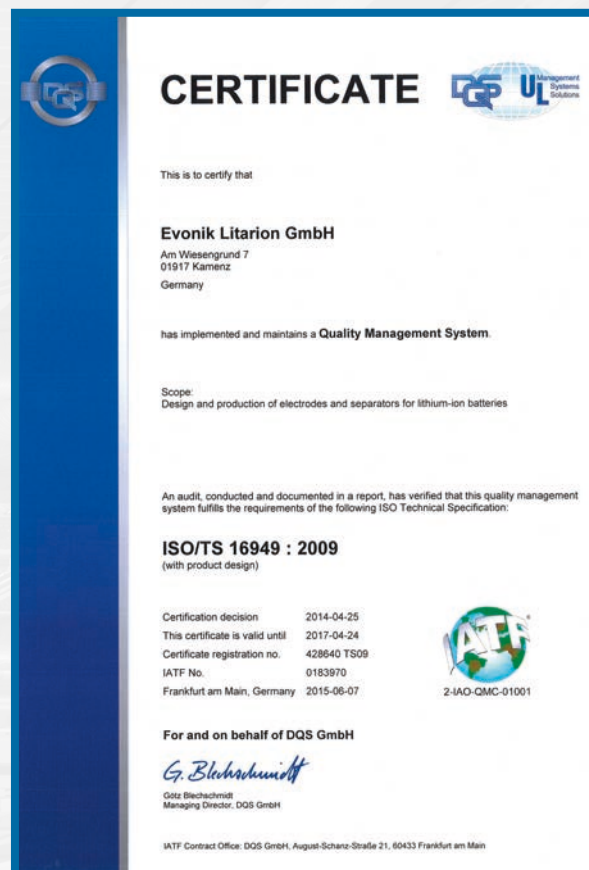
- › Component manufacturing according to ISO 9001 and automotive standard ISO/TS 16949
- › Components well-proven in approx. 20,000 electric vehicles

TYPICAL PROPERTIES

TECHNOLOGY	LITACELL LC-40
ELECTRODES	LITARION® NMC Cathode LITARION® Graphite Anode
SEPARATOR	SEPARION® Ceramic Separator
CAPACITY	40 Ah
GRAVIMETRIC ENERGY DENSITY	150 Wh/kg
VOLTAGE	Max 4.2 V
	Min 3.0 V
	Nominal 3.65 V
CHARGE	4 C
DISCHARGE	10 C
OPERATIONAL TEMPERATURE	Discharge -30°C - +50°C
	Charge 0°C - 40°C
CYCLE LIFE	> 9000 cycles, 1C/1C, 100% DoD
DIMENSIONS (L × W × D)	155 × 249 × 12 mm

EXPERTISE APPLICATION TECHNOLOGY

- › Qualified supplier for automotive industry
- › Profound understanding of performance determining key properties of cell components (electrodes and separators) and their implementation in various cell designs
- › Comprehensive technical on-site support



THE LITACELL CHRONOLOGY

- 1998 Invention of the flexible ceramic membrane SEPARION® by Degussa AG, Germany
- 2002 Market introduction of SEPARION® as a ceramic battery separator
- 2005 Start of electrode development at Degussa AG
- 2007 Foundation of Evonik Litarion GmbH at Kamenz, Germany, as a producer of LITARION® electrodes and SEPARION® separators
- 2007 Market introduction of large format high energy cells using LITARION® electrodes and SEPARION® separators
- 2008 Exclusive supply to Li-Tec Battery GmbH, Kamenz, for large-format lithium-ion battery cells for industrial and automotive applications
- 2009 Certification according to ISO 9001
- 2012 Start of mass production of LITARION® electrodes and SEPARION® separators at Evonik Litarion GmbH for the battery cells of the electric Smart car by Daimler AG
- 2013 Certification according to ISO/TS 16949
- 2014 Global marketing and distribution of LITARION® electrodes and SEPARION® separators
- 2015 Acquisition of Evonik Litarion GmbH by Electrovaya Inc.
- 2015 Launch of LITACELL LC-40, the 40 Ah high performance lithium-ion cell featuring LITARION® electrodes and SEPARION® separator



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