THE WORLD’S MOST RELIABLE > MOST DURABLE > LONGEST-LASTING
CELLS AND BATTERY PACKS

+716.759.5800 +WWW.ELECTROCHEMPower.COM
HERE’S WHY THE WORLD’S LEADING COMPANIES CHOOSE ELECTROCHEM

WHO USES ELECTROCHEM?
We’re the cell of choice for some of today’s most successful companies – and for tomorrow’s most promising industries – just as we have been for more than 25 years.

THE MOST RELIABLE
+ Manufacturing traceability to track every component in each cell
+ 100% leak testing on request (sample testing is standard)
+ "Non-magnetic" cells will not interfere with sensitive data recording instruments
+ Regular long-term testing on all cells and packs
+ Six Sigma™ Quality Improvement Philosophy and ISO quality systems

THE MOST DURABLE
+ Multiple electrode designs let you choose the one that best meets your specs
+ 100% weld inspection, 100% voltage inspection
+ Packs can be fully encapsulated in rubber, since cells don’t off-gas
+ Stainless steel cases

THE LONGEST-LASTING
+ Reduced passivation due to refined and enhanced electrolytes, as well as optimized manufacturing controls
+ Low self-discharge (1%-3% per year)
+ Higher quality electrolytes, with more than a dozen formulations to choose from based on your specs

THE HIGHEST ENERGY DENSITY
+ Up to .9 Whr/cc – nearly three times higher than alkaline
+ 3.93 volt sulfuryl chloride and bromine chloride technologies are the first in the industry
+ Optimized cell balances of core elements for more power, more consistently
+ Capacity of more than 40 Ahr with tall super D cells

THE SAFEST
+ Cells and packs undergo extensive safety and abuse testing
+ Products meet the requirements of “UN Recommendations on the Transport of Dangerous Goods”
+ Protective circuitry prevents short circuit hazards, overdischarge and charging risks
+ Reinforced glass-to-metal seals maintain hermeticity even under extreme temperatures, preventing leakage by allowing internal pressure to be restrained
+ Thermal fuses provide “over current” protection
+ Blocking diodes prevent dangerous reverse current flow
+ Shunt diodes maintain continuity of circuit

FOR THE MOST EXTREME CONDITIONS
+ Designed for temperatures from -55°C to +200°C
+ Shock up to 3,000 g
+ Vibration up to 40 grms

USED BY
GE ENERGY +
HALLIBURTON +
MCDONNELL DOUGLAS +
NASA +
SCRIPPS INSTITUTION OF OCEANOGRAPHY +
SKYBITZ +
U.S. MILITARY +
WOODS HOLE OCEANOGRAPHIC INSTITUTE +

FOR
MEASUREMENT WHILE DRILLING (MWD) +
LOGGING WHILE DRILLING (LWD) +
Pipeline Inspection Gauges (PIG) +
Pressure Measurement +
Mobile Asset Tracking +
RFID +
Fleet Management +
Machine to Machine (M2M) +
Oceanographic Booms +
Sonar Devices +
EPIRBS +
Underwater Vehicles +
Military Communications +
Intelligence and Surveillance +
GPS Systems +
Seismic Surveying +
Memory Back-up +
Automated Instrumentation +
Sensing Devices +
High rate, spiral-wound technology uses proprietary enhanced bromine chloride technology. Delivers superior restart, pulse capability and dependable performance over wide temperature ranges and discharge rates.

Used in fleet management, telematics, seismic surveying, oceanography, animal telemetry and GPS tracking for security and law enforcement surveillance.

BCX85 SERIES

- High rate, spiral-wound technology uses proprietary enhanced bromine chloride technology.
- Delivers superior restart, pulse capability and dependable performance over wide temperature ranges and discharge rates.
- Used in fleet management, telematics, seismic surveying, oceanography, animal telemetry and GPS tracking for security and law enforcement surveillance.

CSC93 SERIES

- Powerful, spiral-wound enhanced sulfuryl chloride technology. Delivers superior restart, high pulse capability and dependable performance over wide temperature ranges and discharge rates. Suited for high rate applications.
- Used in pipeline inspection, oceanography, telemetry and GPS surveillance.

PMX150 SERIES

- Extended temperature sulfuryl chloride technology. Suitable for temperatures to 150°C. Used in high rate, high temperature downhole oil and gas pressure measurement and industrial telemetry.

PMX165 SERIES

- Upper temperature range extended to 165°C.

MWD150 SERIES

- DD size spiral-wound, advanced thionyl chloride technology suitable for dynamic, mechanically demanding applications. High temperature applications in downhole oil and gas measurement while drilling and industrial telemetry.

QTCDD SERIES

- Spiral-wound proprietary thionyl chloride technology suitable for high current, high capacity military applications and industrial telemetry.

VHT200 SERIES

- Spiral-wound advanced thionyl chloride technology using specialized alloyed anode for demanding, high temperature applications to 200°C.

Developed for the most demanding applications, where a failed battery can cost you a lost day of production, half a million dollars in lost revenue or even a human life.

- Advanced spiral-wound technology
- All High Rate Cells have internal fuses
- Used for high temperature downhole and pressure gauge applications, pipeline inspection gauges (PIG), military communications, surveillance, telematics, asset tracking, long-term oceanographic deployment and more
- DD cells deliver continuous current up to 4 A per cell and total capacity up to 30 Ahr

Contact Electrochem Commercial Power for our complete range of cell types, capacities, temperature ranges and cell sizes.
MODERATE RATE
PROVEN RELIABILITY AND SAFETY

150MR SERIES

Ideally suited for high temperature, high shock and vibration applications such as downhole oil and gas and industrial production environments. The 150MR Series Moderate Rate Cells are designed to deliver reliable performance under harsh environmental and application conditions.

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>SERIES</th>
<th>DIAMETER (mm)</th>
<th>LENGTH (mm)</th>
<th>LITHIUM WEIGHT (g)</th>
<th>RATED CURRENT (mA)</th>
<th>MAX CURRENT (mA)</th>
<th>RATED CAPACITY (Ahr)</th>
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OPEN CIRCUIT VOLTAGE: 3.67V

165MR SERIES

Extends the upper temperature limit to +165°C as required in advanced deep oil well exploration.

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OPEN CIRCUIT VOLTAGE: 3.67V

180MR SERIES

High temperature operation to +180°C for extremely harsh environments where high shock and vibration performance is required.

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OPEN CIRCUIT VOLTAGE: 3.67V

200MR SERIES

Utilizes proprietary anode alloy technology to extend the upper temperature limit to +200°C.

<table>
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<th>PART NUMBER</th>
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OPEN CIRCUIT VOLTAGE: 3.67V

For reliable rate capabilities, even under extreme conditions, Electrochem cells deliver - day after day, year after year.

+ High internal surface areas for higher power output
+ Continuous and pulsed current
+ Designed for a wide variety of uses, including Measurement While Drilling (MWD)
+ Sized from sub CC cells, to the industry standard DD and even the new 47mm diameter super D cell

Self-discharge for all Moderate Rate Cells is <2% per year at 25°C.

Higher pulse currents are possible. Refer to data sheet for complete product details.

Reinforced “non-bulge” cell-spacer may be added to equal next standard length.

Rated Capacity measured at 100°C.

Rated Capacity measured at 120°C.

Contact Electrochem Commercial Power for our complete range of cell types, capacities, temperature ranges and cell sizes.

WWW.ELECTROCHEMPower.com
+ 716.759.5800
Low Rate, bobbin style design uses proprietary thionyl chloride technology. Used in animal telemetry, GPS tracking for security and law enforcement surveillance, and non-implantable medical applications. Ultra miniature cell sizes feature high energy densities. Cell range Sub-AAA to DD size. Used in low rate applications.

150LR SERIES

Low rate, bobbin style design for high temperature applications. Used in oil and gas exploration, industrial telemetry and OEM applications.

Offering high energy densities, cells range from Sub-AAA, ⅛ AA to uniquely sized ⅞ C and CC sizes. Used in low rate applications requiring reliable performance at elevated temperatures.

180LR SERIES

Low rate, bobbin style design for extreme high temperature applications. Used in oil and gas exploration, industrial telemetry and OEM applications.

200LR SERIES

Low rate, bobbin style design for extreme high temperature applications. Used in oil and gas exploration, industrial telemetry and OEM applications.

Still using old technology or another brand’s inferior lithium cell? Our high standards mean your Low Rate Cells work better.

+ Proven bobbin and PC-style construction techniques
+ Good capacities and high energy density
+ Continuous and pulsed currents
+ Ideal for biological studies (including animal telemetry), fisheries, environmental studies and low current downhole petroleum uses
+ Wide range of cell sizes, from 7-10 ultra-miniature to DD high temperature cell

Contact Electrochem Commercial Power for our complete range of cell types, capacities, temperature ranges and cell sizes.

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A HISTORY OF INNOVATION > Since 1979, we’ve specialized in providing power for highly critical commercial applications, where the cost of failure far outweighs the cost of a cell. We invest a considerable amount of money on research and development, offering new and improved designs each year for our cells and packs. Today, Electrochem is a division of Greatbatch Ltd. (NYSE: GB), the world’s leading manufacturer of medical batteries for implantable applications.

AVAILABLE AROUND THE GLOBE > Sometimes, you need it yesterday. Our Value-Added Reseller (VAR) program includes dozens of resellers around the world, selected and trained by Electrochem to help you solve your power needs ASAP. For a complete list of Electrochem authorized VARs, go to www.electrochempower.com/HowToBuy.

COMPREHENSIVE PRODUCT SELECTION > Just give us your specs and we’ll help you select the cell or pack that works best for you – and show you the test results to prove it. With nearly 20 sizes, multiple electrode designs and more than a dozen electrolyte formulations, we can design a semi-custom cell for your specific application.

- **DIFFERENT ELECTRODES SPECIFICALLY DESIGNED FOR DIFFERENT APPLICATIONS**
- **MORE THAN A DOZEN ELECTROLYTE FORMULATIONS, DEPENDING ON INTENDED USAGE**
- **WE TEST OUR CELLS BASED ON YOUR SPECS AND SHOW YOU THE RESULTS TO LET YOU DECIDE**

![Graph: The Electrochem Commercial Power High Rate D Cell Difference](image)

THE ELECTROCHEM COMMERCIAL POWER HIGH RATE D CELL DIFFERENCE
CAPACITY VERSUS CURRENT AND TEMPERATURE (Capacity to a 2 V cut off)

- Electrochem
  - Model 3B35, CSC93
  - +70°C
  - +20°C

- Competitive Brand
  - Model “Spiral D”
  - +70°C
  - +20°C

ELECTROCHEM PACKS > We can provide the safest, most efficient packs to meet your specs at an affordable price. And if you need a battery pack we don’t have, we’ll custom build a prototype for you to meet your requirements.

- **CUSTOM DESIGN AND ENGINEERING IS STANDARD AT ELECTROCHEM**
- **NO OFF-GASSING MEANS YOU CAN GET A FULLY ENCAPSULATED PACK BUILT WITH DURABILITY IN MIND**
- **QUICK TURNAROUND ON CUSTOM PROTOTYPES**