

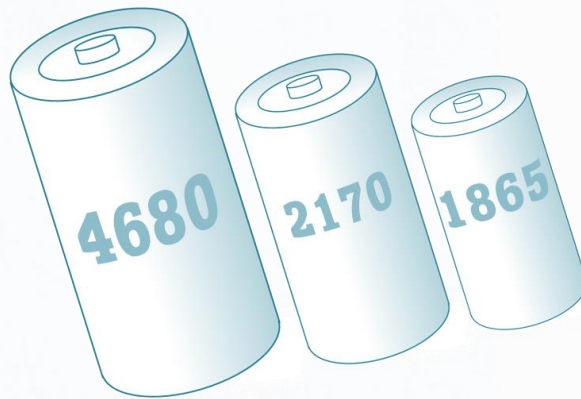
**MUNRO**

# EV BATTERY CELL ANALYSIS REPORT

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**2022 TESLA MODEL Y CYLINDRICAL 4680 REPORT**

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POUCH 270X107X13  
CYLINDRICAL 2170  
CYLINDRICAL 1865  
POUCH 255X95X14  
CYLINDRICAL 2170  
CYLINDRICAL 2170  
POUCH 266X106X12

The Battery Cell Analysis report includes cell details from multiple BEVs, starting with the 2022 Tesla Model Y 4680. The data collected includes everything from photographs of construction, dimensional analysis, and electrical performance to chemical and SEM/EDX elemental composition analysis of the separator, anode, and cathode. The chemical analysis documents thickness and mass of cathode/anode/separator, plus detail active material, conductive carbon, and any binder/additive materials in the cathode and anode, as well as detail the base film and ceramic coating on the separator. Also provided is an analysis of the electrical performance of the cells, including ED, Capacity, Coulombic efficiency, voltage/current profile, and HPPC. The Ford Mach-E pouch cell, GM Bolt (pre-recall) pouch cell, and the Rivian 2170 cylindrical cell analyses will follow.

## REPORT PRICING

Customers can purchase Battery Analysis Reports as they become available. Munro will provide updates on our progress and notifications will be posted on <https://leandesign.com/reports/> and <https://munrolive.com/the-reports>.

1. Clients who purchased prior Munro EV benchmarking reports are offered preferred pricing, contact [reports@leandesign.com](mailto:reports@leandesign.com) for a quote.
2. New customers can purchase our EV Battery Cell reports by contacting [reports@leandesign.com](mailto:reports@leandesign.com) for pricing.
3. Note: Elements from prior Munro Benchmark reports are used and supplemented with newly obtained battery cell test data. Battery cells in the study were extracted from battery packs in Munro purchased vehicles.

## REPORT OVERVIEW

This report provides information and analysis of prominent EV battery cells used by OEMs such as Tesla, Ford and Rivian. Included is an in-depth analysis of the physical, chemical and electrical aspects of each battery cell as outlined below.

### Observations & Summary

#### Physical

- Cell Weight and Cross Section
- Disassembly Weights
- Jellyroll Weights and Dimensions
- Images of Anode and Cathode
- CT Scan of Interesting Parts (Current Collectors)
- Measurements of Welds

#### Chemical

- Composition of Separator
- Composition of Anode and Cathode

#### Electrical

- Charge Capacity (Ah) and Efficiency
- Voltage vs Time and Voltage vs Current Curve on Charge/Discharge
- $\Delta T$  on Capacity Check
- Hybrid Pulse Power Characterization (HPPC)
- Pulse at 3 States of Charge Tests
- Cell Summary
  - Capacity
  - Energy
  - Nominal Voltage
  - Energy Density Volumetric vs Gravimetric
  - Cathode Areal Capacity
  - Cathode Gravimetric Capacity



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- All reports and accompanying deliverables are made available for easy access through a secure File Transfer Protocol (FTP) site.
- A user-friendly PDF format ensures ease of viewing, sharing, and printing.
- The large reports feature a linked table of contents, allowing users to easily navigate the report contents and quickly locate specific data.

## FREQUENTLY ASKED QUESTIONS

- **Were any OEMs involved in the study?**

No. OEMs nor suppliers were used in this study.

- **Is there any proprietary information in this report?**

No. All data was developed through analysis and standardized testing methodologies on battery cells obtained from Munro's purchased production vehicles.

- **How can I receive more details on the contents of the reports?**

Questions regarding report contents should be sent to [reports@leandesign.com](mailto:reports@leandesign.com) Munro will respond with clarification, and if necessary, meet virtually to discuss and review. Complex and/or detailed requests may require additional consulting fees.