



# Charge Ahead: Mastering E-Mobility Challenges through Specialized Battery Testing

TÜV Rheinland Battery Testing Center –  
Pioneering Automotive Battery Systems Testing

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# 1 Navigating Common Challenges in the EV Battery Landscape

## Your Challenges. Our Solutions.

### **LACK OF TEST RESOURCES DELAYING YOUR PROJECTS?**

Meet one of the world's largest battery testing laboratories in the heart of Europe – we support clients from validation tests accompanying development to the type approval of vehicle batteries.

### **STRUGGLING TO MANAGE PROJECTS DUE TO DIVERSE VEHICLE AND BATTERY SYSTEMS?**

Experience flexible handling and a broad scope of specifications for any vehicle model and battery system.

### **FINDING IT HARD TO KEEP UP WITH COMPLICATED PROCEDURES AND GUIDELINES?**

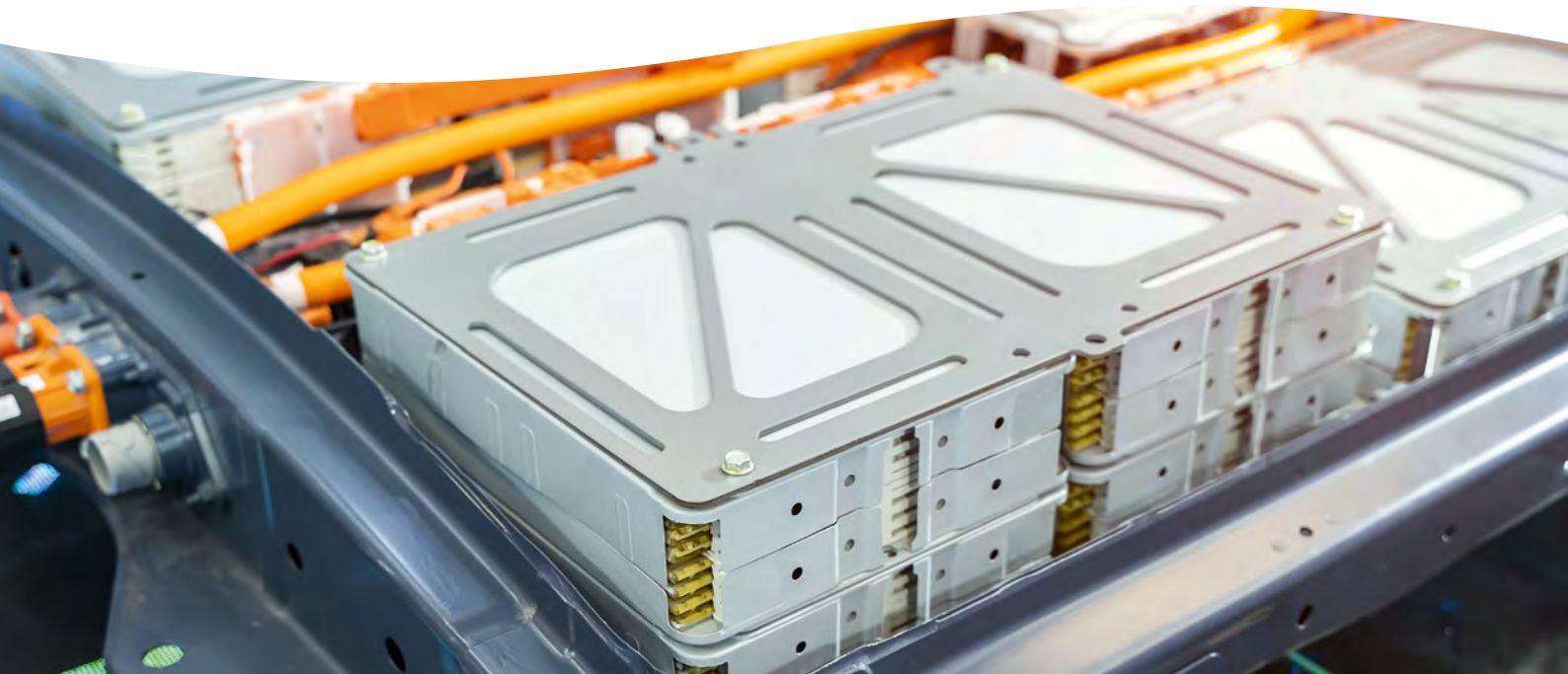
Benefit from our globally networked Battery Lab and experienced team covering the entire value chain for traction batteries, meeting both battery validation and regulatory standards.

### **WORRIED ABOUT SAFETY INCIDENTS IN TEST LABS?**

Rely on our multi-stage safety and environmental protocols, from risk mitigation measures to extinguishing systems.

“We can perform almost any test you can put a battery through here.  
Only very few laboratories in the world have this capability.”

Ansgar vom Hemdt, Managing Director TÜV Rheinland ACT



## 2 Inside Europe's Most Advanced Battery Testing Center

### TÜV Rheinland Battery Testing Center

One-Stop Solution for All: From Validation Tests and Development Support to Final Type Approval of Vehicle Batteries.

#### COMPREHENSIVE BATTERY TESTING SOLUTIONS IN EUROPE'S MOST MODERN INDEPENDENT FACILITY

The TÜV Rheinland Battery Testing Center offers a one-stop shop service for vehicle traction batteries. The services provided by the battery experts in Aachen (western Germany) range from planning and carrying out various validation tests according to customer standards until profound support with the type approval of vehicle batteries.

#### NAVIGATING THE ROAD TO E-MOBILITY WITH EXPERTISE AND INNOVATION

We are the preferred partner of the automotive industry in the transformation towards E-mobility. Besides a state-of-the-art infrastructure, comprehensive safety and environmental protection technologies, our technical experts are experienced in the flexible handling of demanding projects, circumventing delivery bottlenecks and coordination with regulatory experts.

#### OVER 150 YEARS OF SAFETY AND QUALITY: OUR TRACK RECORD SPEAKS FOR ITSELF

As part of TÜV Rheinland Group we have a strong track record with testing and type approval services for OEMs/TIER-X suppliers. As one of the world's leading testing and certification service providers, TÜV Rheinland stands for safety and quality in virtually all areas of business and life. Founded in 1872, the company has more than 20,870 employees and annual revenues of around 2.3 billion €.

#### KEY FIGURES:

Founded in 2020

~ € 25m. invest

25 employees

Over 2,200 square meters



## Our Target Groups: Addressing the Unique Requirements of Each E-Mobility Stakeholder

While we have a focus on large traction batteries for the automotive industry, we are experienced in battery testing for different industries. Our services are tailored to meet the specific needs of a wide range of clients. Whether you're an Original Equipment Manufacturer (OEM), a Tier supplier, an Engineering Service Provider (ESP), a Battery Producer, or a Research Organization, we offer solutions that are scalable and adaptable to your unique requirements and challenges.



OEMs



Tiers



Engineering  
Service Provider



Battery  
Producer

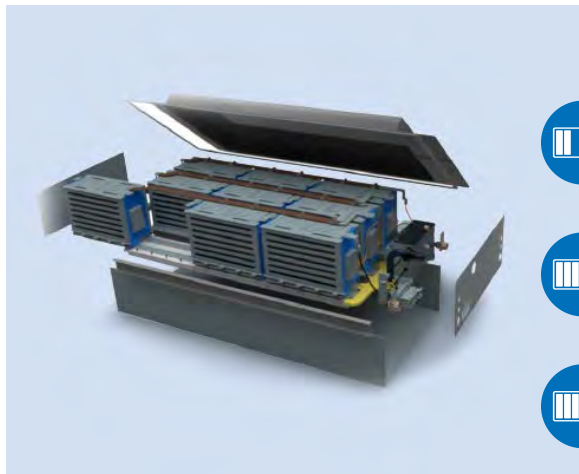


Research  
Organization

## End-to-End Excellence: Your Guide Along the Value Chain, from Early Prototypes to Products

Our specialized battery testing services are the cornerstone of our offerings. We provide extensive testing options that range from early prototypes to D samples, ensuring that we cover the full spectrum of your battery's lifecycle.

### Our focus are large-scale battery packs



#### TYPE OF BATTERY

Testing services offered primarily for battery packs and modules.



#### DIMENSION, WEIGHT AND POWER

The test specimen can have a mass up beyond 800 kg and 150 kWh with a size exceeding 2.3 m x 1.6 m x 0.4 m (L x W x H). Customized parameters on request.



#### SAMPLE TESTING

Battery testing possible from prototype to D-sample.

## Our Accreditations Speak for Us:



ISO 17025

accredited testing  
laboratory



TISAX

Assessment Level 3,  
including prototype safety



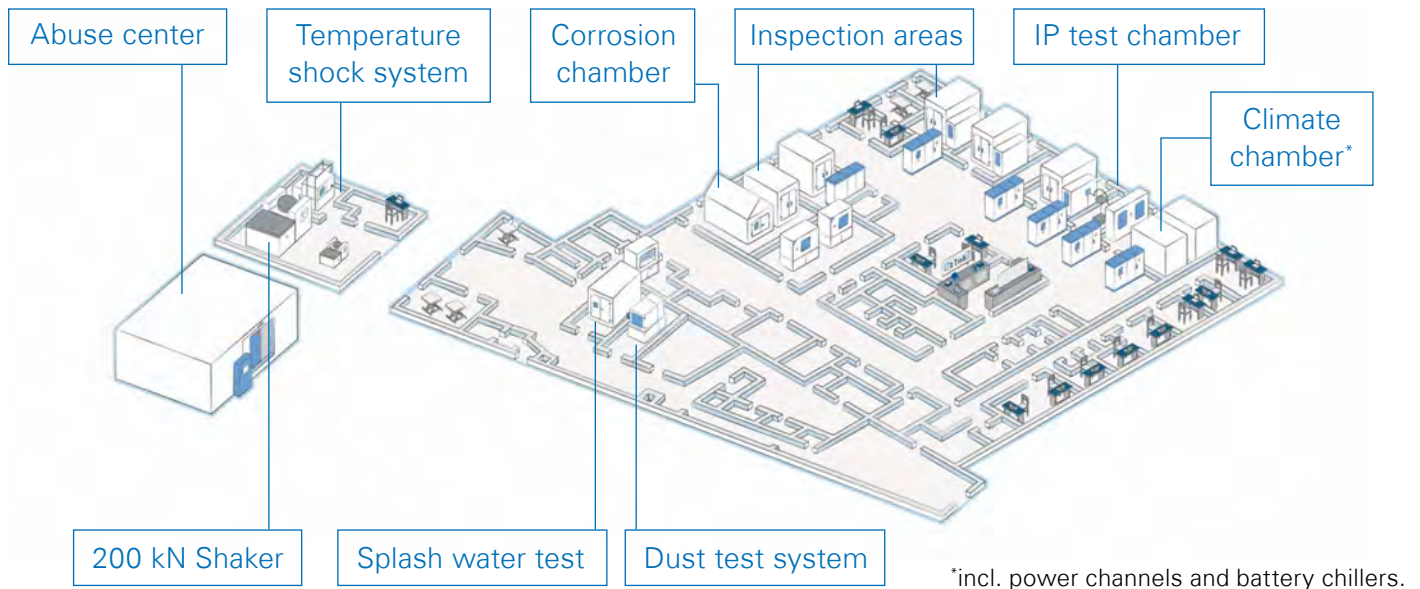
ISO 9001

accreditation within  
the TR Group.



# Step Inside the TÜV Rheinland Battery Testing Center

Based in the heart of Europe, the TÜV Rheinland Battery Testing Center represents the pinnacle of modern testing facilities. Our lab showcases state-of-the-art equipment and technology that set us apart as a leading authority in battery testing.



## Electrical Tests:

Discover the rigor of our lifetime and performance tests conducted under varying climatic and environmental conditions. From module to pack level, we ensure every aspect is scrutinized.

## Mechanical Tests:

Our mechanical integrity tests, including vibration and shock tests, are designed to mimic real-world conditions, offering valuable insights into your battery's durability.

## Environmental Tests:

In our advanced chambers, we conduct a variety of environmental tests – dust, corrosion, IP leakage, splash water, and even salt water immersion – to assess your battery's resilience against harsh conditions.

## Performance Tests:

Specializing in performance tests at both module and pack level, our facility is equipped to offer insights that help improve your battery's efficiency and reliability.



## OUR HIGHLIGHT: ABUSE TESTS

We go beyond conventional parameters to evaluate how batteries react when pushed to the limit. Our electrical and thermal abuse tests, as well as mechanical abuse tests like fall/drop and crush, provide critical data for safety assessments.

### Forcing Thermal Propagation:

We rigorously test how your batteries respond to conditions like overheating or nail penetration and thermal propagation, delivering critical safety data.

### Advanced Safety Technologies:

Our facility is equipped with explosion safety measures, a modern extinguishing system and a high-performance exhaust gas cleaning system to ensure utmost safety during testing.

**Our comprehensive Abuse Testing Methods include, but are not limited to:**

- Crush Tests
- Thermal Propagation
- Fire Resistance Tests
- Short Circuit Tests
- Drop Tests
- Overcharge Tests

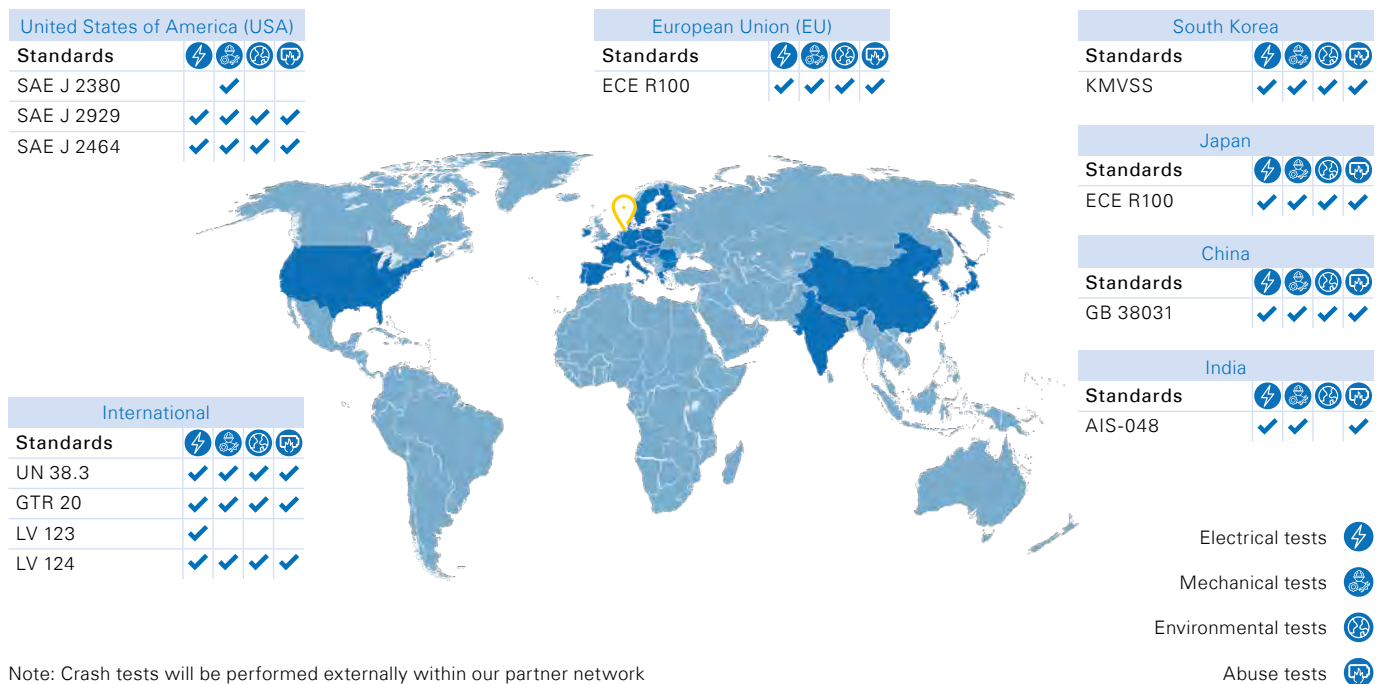
### 3 Navigating Battery Standards: A Global Perspective

#### Meeting Global Standards:

#### How TÜV Rheinland Ensures Battery Safety and Performance Across Borders

In the fast-paced world of electric mobility, adherence to safety standards and norms is not just a regulatory requirement but also a competitive edge. Our battery lab, integrated into the worldwide network of TÜV Rheinland, provides comprehensive solutions for traction battery testing. Our team of experts navigates the complex landscape of global industry and regulatory standards, ensuring your battery solutions meet the required criteria for market entry across major economies like China, India, Japan, South Korea, and the USA. Through our global network, both internally and externally, we are very familiar with the conditions in all relevant markets. But we don't just stop at compliance; we are deeply committed to protecting your intellectual property, ensuring our operations meet the highest standards of information security.

**With TÜV Rheinland, you're not just meeting standards – you're setting them.**



"The type approval is one of the key expertise areas of TÜV Rheinland. We can support the customer throughout the entire process, from testing to communication with the authorities."

Artur Schneider, Managing Director TÜV Rheinland ACT



## 4 Safety and Environmental Protection Technology

### Elevating Safety and Environmental Protection in Battery Abuse Tests: Our Pledge to Sustainability and Safety

The safety of batteries is a non-negotiable requirement in today's fast-paced world of technology. It's not just about avoiding fire or explosion risks; it's also about minimizing the leakage of potentially hazardous substances. At TÜV Rheinland Battery Testing Center, we've implemented cutting-edge safety and environmental protection technologies to ensure both safety and sustainability.

### We Ensure Both Safety and Environmental Protection

Since TÜV Rheinland stands for safety and quality in virtually all areas of business and life, we are committed to fulfill highest standards. At the same time, we are committed to paving the way for the future of sustainable mobility. When it comes to abuse testing, we created a testing environment with controlled conditions as well as highest safety and environmental standards.

#### SAFETY

- **Robust Pressure Relief Flaps:**  
Pressure Relief Flaps to protect building structure in case of uncontrolled pressure increase
- **High Performance Ventilation:**  
Powerful ventilation system to prevent formation of explosive atmosphere during event
- **Advanced Gas Detection:**  
Gas detection system to ensure early alerting and thus enabling the timely realization of risk mitigating measures
- **Modern Extinguishing System:**  
Extinguishing system to control and eventually stop the thermal reaction of the battery



#### ENVIRONMENTAL PROTECTION

- **Multi Stage Waste Gas Purification System:**  
Advanced exhaust gas treatment via multi-stage cleaning process specifically designed to battery fire scenarios to prevent pollution of the atmosphere
- **Hazardous Substance Management:**  
Safe collection and disposal of contaminated and waste water throughout the entire process chain to prevent pollution of the soil

Concepts and protocols in place to ensure safety and process compliance



# Unlock the Future of E-Mobility: Talk to Us Today!

Connect with our experts.



Artur Schneider  
Managing Director



Ansgar vom Hemdt  
Managing Director

Contact one of our experts:

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