



# Energy Storage Testing & Certification that Evolves with Your Industry



We test to the standards, regulations, or directives developed by the following accredited organizations:

**IEC, UL, CSA, ANSI, SCC, UN Regulations**





## Provide a Reliable, Resilient, and Safe Supply of Energy for your Customers

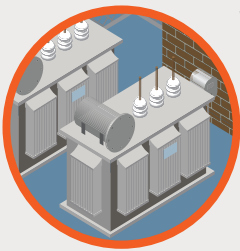
Increased use of technology in home and commercial sectors, the global movement toward renewables, and the demand on existing energy grids have made Energy Storage Systems (ESS) a crucial need in today's world.

ESS allow for the decoupling of electricity generation and electricity consumption. This

decoupling means electricity can be traded, valued, and used when it is most advantageous to the market. One benefit is that energy supply is no longer as susceptible to power surges due to weather or other uncontrollable factors.

As a manufacturer and supplier of these systems, you need to know that your product can provide an uninterrupted and safe supply of energy for your customers. CSA Group can evaluate and test your projects, including ESS and their components, throughout their lifecycle at our advanced laboratories or in the field.

Whether you're a utility company that needs to reliably provide electricity during demand fluctuations, a data center or communications company that needs uninterrupted service, or a provider of residential ESS, you can count on CSA Group to test your product for compliance with the right standards.





## FUNCTIONAL SAFETY

Our functional safety evaluation uses a number of risk assessment tools and standards to identify potential hazards and levels of risk. A Failure Mode and Effects Analysis (FMEA) evaluates potential dangers if one of your ESS components, software, or logic device fails, providing invaluable information to help you make your product safer. If you are looking at installing an ESS, we can help you early in the process with a gap analysis. We'll outline the requirements of the applicable standards and how testing will be carried out in order for you to understand how to meet compliance requirements. CSA Group will examine your product's lifecycle to verify whether or not the automated safety systems - including components such as inverters and batteries - are compliant with the standards.



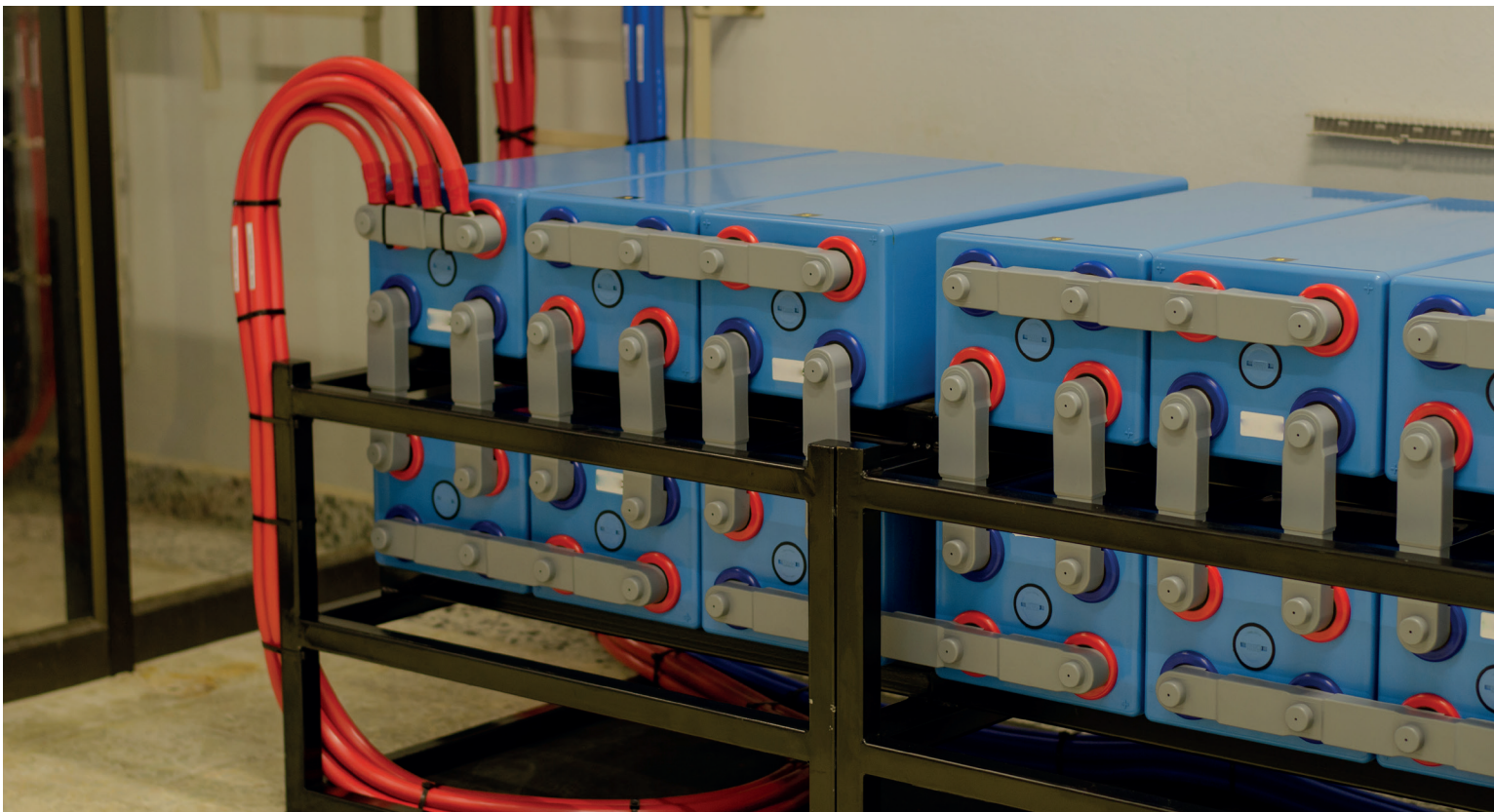
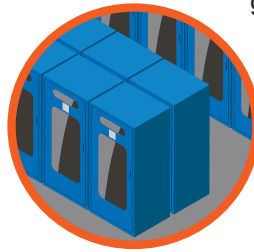
## SAFETY TESTING

Energy storage systems are subject to the same potential safety hazards experienced by other complex electrical systems. Risks need to be assessed and mitigated to protect every aspect, including workers, power supply reliability, stakeholders, and the investment you've made in equipment and infrastructure. Our qualified testing and certification experts are knowledgeable in all the applicable ESS standards and can help you feel confident that your ESS are operating in accordance with compliance requirements.

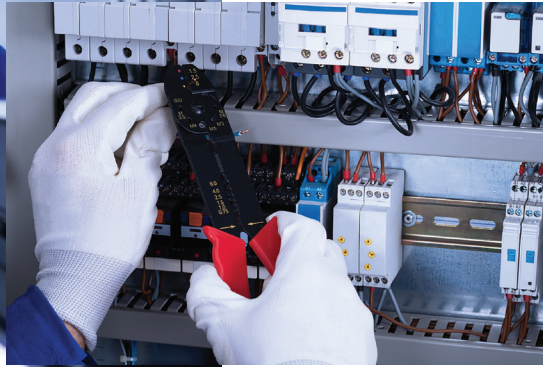


## PERFORMANCE TESTING

Energy storage systems, such as power and grid services or electric vehicles, need to constantly operate at top capability. CSA Group can help you meet end-user expectations and provide evidence in support of safety and the performance demanded by your customers. Help support your compliance and quality claims for your energy storage products with this more customized testing.







**One benefit is that energy supply is no longer susceptible to demand fluctuations due to weather or other uncontrollable factors.**

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### **FIELD EVALUATION/ SPECIAL INSPECTION**

Grid-connected stationary ESS that are built on site or in limited production runs may need on-site inspections and evaluation. We can verify whether your system complies with applicable safety requirements, including safety standards and installation codes. We can provide you with a review of instructions for safe system operation, inspection labeling, test reports, and other documentation to support you during regulatory approval.



### **FIRE TESTING**

Like any other electrical product, ESS are vulnerable to risks of fire, explosion, burns, electrical shock, and arc flash. Starting in the design phase and continuing through to manufacturing, installation, and operation, our experts will share their knowledge of standards and understanding of inspection needs. We will perform system and component evaluations to properly match fire protection methods to the system.



### **CYBERSECURITY**

Your customers rely on you to provide them with uninterrupted energy and secure network integration.

Advances in technology and wireless interconnectivity can help you

do this. But interconnectivity also means an increased risk of cyber-attacks.

Outside groups with adverse intentions could enter a utility grid network and potentially

cause blackouts, or they could

manipulate a commercial lighting or security system to weaken defenses against theft.



CSA Group is a leader in cybersecurity testing, including bench testing, gap analysis, and Security Development Lifecycle Assurance (SDLA). We will help you identify potential issues and security measures to reduce the chance of malicious intrusions, interrupted service, and potential revenue losses.



## The CSA Group Difference

Rely on an internationally recognized company with over 100 years of expertise and knowledge. From our early beginnings developing standards for railway bridges to today's latest sustainable technologies, we're always looking forward and developing innovative standards and testing programs for the most advanced and emerging technologies. Drawing on our industry accreditations, our customer-focused experts can create custom solutions that meet your unique testing, inspection, and certification needs. That's how we're holding the future to a higher standard.



### TRANSPORTATION TESTING

All cells, battery packs, and end products need to get to your customers reliably and efficiently, but battery products are unique and need additional consideration during transportation in order to mitigate danger. Evaluations include testing and certification to IEC 62133 which can potentially reduce redundant testing and expense when done in combination with UN 38.3 testing.

Lithium-ion (Li-ion) cells and batteries are increasingly used in smartphones, tablets/PCs, digital cameras, and power tools, and demand is expected to grow significantly as the use of electric vehicles increases. UN 38.3 classifies Li-ion cells, and batteries require testing to UN 38.3 to help avoid costs and delays in shipping.

Our experts can tailor a UN 38.3 testing program to help you effectively reduce risks such as fire, explosion, toxic gas venting, and rupture.

CSA Group battery experts can help you plan and implement the tailored testing program you require to meet UN 38.3 and associated applicable requirements. Our services will help you increase your speed to market and support your overall business goals.

In addition to IEC 62133 and UN 38.3, we evaluate and test to the following standards:

- ESS System Safety: UL 9540
- Grid Interconnection: CAN/UL 9540, IEEE 1547 Series and CA Rule 21/HI Rule 14H/UL 1741 SA
- Energy Storage Equipment: CAN/UL 1973
- Power Conversion and Protection Equipment: UL 1741 and CSA C22.2 1071
- National, State, and Local Installation Codes



[csagroup.org/battery](https://csagroup.org/battery)

## Contact Us

Put CSA Group's industry-leading knowledge and experience to work for you.

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