



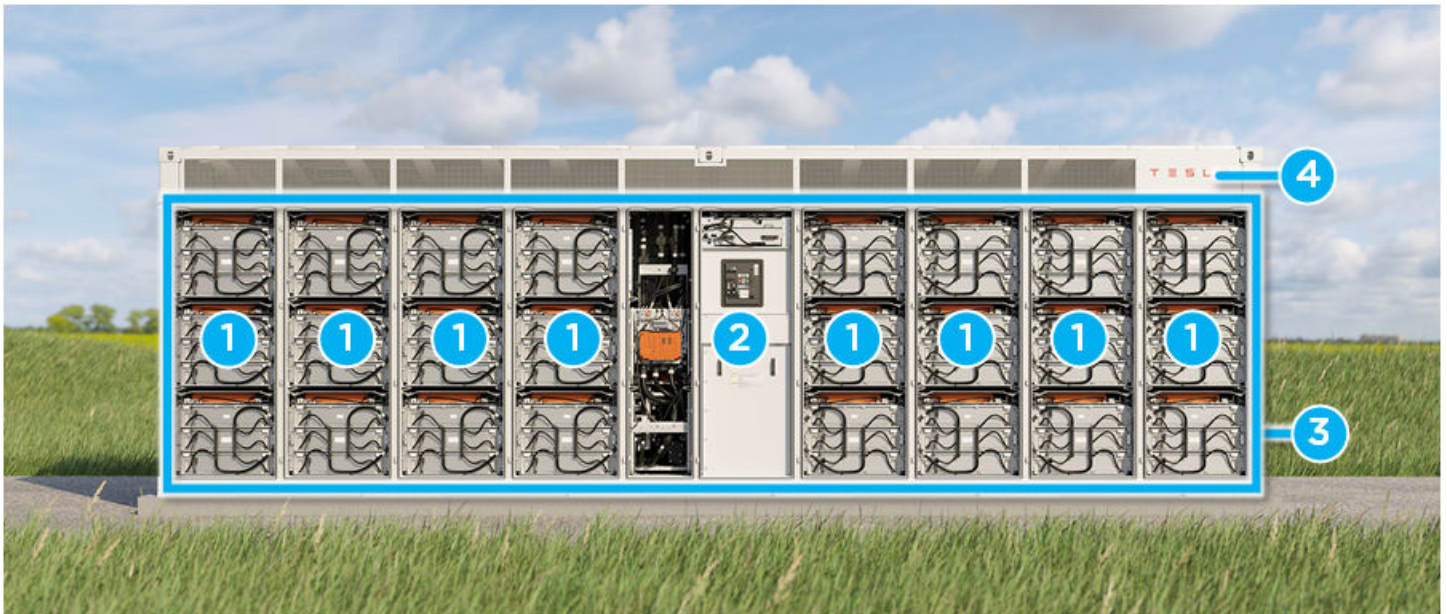
MEGAPACK 2 XL SAFETY OVERVIEW

ENHANCED SAFETY ARCHITECTURE

Tesla's commitment to safety informs every Megapack design decision and has guided 15+ years of experience in battery module design and manufacturing for both vehicle and energy storage applications. Megapack 2 XL (Megapack) is designed with features that make the product safe throughout the entire product lifecycle — during transit, installation, commissioning, operation, maintenance, and decommissioning.

Tesla's approach to safety involves comprehensive design and testing at every level of Megapack. Vertical integration across design, manufacturing, and testing ensures that safety features of the cell, battery module, inverter, thermal system, and overall system-level components are closely linked and not decoupled.

In addition, Tesla is continually improving Megapack safety features and capabilities based on data from operational experience.



1. Battery modules with active and passive fuses – externally serviceable
2. Touch-safe Customer Interface Bay
3. Non-walk-in IP66 enclosure and deflagration mitigation
4. Thermal roof with overpressure vents

INDUSTRY-LEADING COMPLIANCE AND THIRD-PARTY VALIDATION

Tesla is constantly pushing the boundaries and raising the bar on product safety. This commitment to safety not only ensures that Tesla's products are compliant to the industry's most stringent global standards, but also sets a benchmark for the industry to follow regarding energy storage safety. Megapack has met and exceeded many industry safety standards and has demonstrated through extensive third-party testing that it is one of the safest energy storage systems on the market.



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Megapack 2 XL is listed to the following standards by OSHA-recognized Nationally Recognized Testing Laboratories:

- UL 1642 (cell-level certification)
- UL 1973 and IEC 62619 (battery module-level certification)
- UL 9540, IEC 62933-5-2, IEC 62109-1 (system-level certification)
- UL 1741, CSA C22.2 #107.1 (power electronics)
- UL 1998 and IEC 60730 Annex H (functional safety of software)
- IEC 61000-6-2, and EN 55011 (EMC)
- UN 38.3 (transportation, self-certified)
- IEEE 693 (seismic safety)
- UL 9540A (large-scale fire testing): Tested at the cell, module, and unit level
- And many more, including compliance to major market grid codes

Megapack 2 XL, like Megapack, is designed to comply with major installation codes for energy storage systems, including NFPA 855, IFC 2018 and 2021, and NEC 2020.

Megapack 2 XL has been reviewed and validated by an Independent Engineer, both at the product level and for the results of large-scale fire testing.

ENHANCED APPROACH TO FIRE SAFETY

To date, Tesla has deployed more than 10 GWh of stationary energy storage products globally with a strong safety track record.

Through vertical integration, Tesla has designed Megapack with fire safety built directly into the product at every level. This makes the product safer and reduces overall project costs by eliminating the need for fire suppression systems.

At the cell level, Tesla's latest generation of Megapacks leverages the lithium iron phosphate (LFP) chemistry and a new industry-leading cell design. Testing has demonstrated a strong ability to resist thermal runaway, and has shown controlled venting in worst-case events, without explosive bursts or fire.

All Tesla products also undergo rigorous testing at the module level. While standards such as UL 1973 and IEC 62619 ensure propagation resistance to single-cell thermal runaway, testing has shown that Megapack battery modules are resistant to multiple co-located cells sent into runaway at the same time. This greatly mitigates the risk of a thermal event.

At the system level, Megapack is designed with a combination of dedicated runaway gas igniters and overpressure vents built into the roof that passively mitigate the risk of deflagration hazards in case of unlikely accumulation of flammable gases due to arc flash events or thermal runaways.

In the unlikely event of a fire, rigorous full-scale fire testing has shown that Megapack performs in a safe and controlled manner, consuming itself slowly and without explosive bursts, projectiles, or unexpected hazards. The vents are designed to direct all gases, smoke, and flame out of the top of the Megapack, minimizing risk to nearby response personnel and exposures.

In the event of a fire at a Megapack site, the fire service will be able to manage the event with standard fire service response equipment. Tesla's *Lithium-Ion Battery Emergency Response Guide* provides more details on that subject. The cells used in Tesla products do not contain solid metallic lithium and thus do not react with water. When required by local code, Tesla recommends fire detection at the site level with the use of third-party thermal imaging cameras that can detect fires on site.



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24/7 GLOBAL SUPPORT

Megapack is supported by Tesla's Network Operations Center, designed to support the global fleet of energy storage products. The 24/7 operations center offers remote monitoring, diagnostics, and troubleshooting capabilities, without the need of having a Tesla technician on site. Customers and first responders also benefit from immediate hotline support from trained technicians in case of emergencies.



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