

Case Study

Weiss Technik designs a large-capacity Thermal Shock chamber for validation testing of electric drive modules.

WHY

An automaker's testing center required a solution to ensure the durability of electric drive modules under extreme temperature conditions, one specifically capable of handling a test load of more than 800 lbs.

HOW

Weiss Technik provided a custom Horizontal Thermal Shock Chamber with a large transfer basket and robust refrigeration system, allowing rapid transitions between hot and cold environments.

WHAT

The 58-cubic-foot Horizontal Thermal Shock Chamber featured a 1000-lb transfer basket, a temperature range from -70°C to +200°C, and advanced control systems, making it ideal for testing heavy electric drive modules.

WHY - the challenge.

A leading global automaker is developing electric vehicles and needs to rigorously test electric drive modules. At their technical center, they focus on testing components under real-world conditions to ensure performance, safety, and longevity. The specific challenge was to test these modules for thermal shock—rapid and extreme temperature fluctuations—to identify any potential weaknesses in material or design.

Given the scale of their operations and the critical role electric drive modules play in the overall functionality of EVs, the automaker needed a testing solution that could handle an 880 lb test load and maintain strict environmental control. The chamber had to simulate extreme cold and heat quickly, consistently, and reliably to accelerate product testing cycles.

HOW - the idea.

Recognizing the unique demands of this project, particularly the need to handle the large size and weight of the electric drive modules, the Weiss Technik team proposed a solution in the form of a high-capacity thermal shock chamber that could not only accommodate these heavy components but also execute precise, rapid temperature changes. What set Weiss Technik's offering apart was its combination of robust mechanical design and advanced software integration, which ensured reliable performance while allowing remote operation and control.



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WHAT - the solution.

The custom Horizontal Thermal Shock Chamber featured a 58-cubic-foot internal capacity, large enough to accommodate the automaker's electric drive modules. With a transfer basket capable of holding up to 1000 lbs, the chamber was specifically designed for handling the size and weight of heavy components while maintaining precise control over the thermal shock process.

The chamber's temperature ranges were extensive, with a cold zone capable of reaching as low as -70°C and a hot zone that extended up to 200°C. This ensured that even the most extreme temperature conditions could be simulated, testing the electric drive modules for resilience under both freezing and overheating scenarios. The integrated WEBSeason 10" tablet controller allowed for efficient local management, while Simpati remote access software enabled the automaker's engineers to operate the system from anywhere, streamlining the testing process.

System Highlights

- 58-cubic-foot capacity for testing large components.
- Transfer basket capable of handling up to 1000 lbs.
- Cold zone temperature range: -70°C to +180°C.
- Hot zone temperature range: +55°C to +200°C.
- Dual remote cascade refrigeration system to process the heavy test load.
- High-efficiency refrigeration system for rapid cooling.
- Quiet refrigeration systems to lower machine pack noise level to ~68 dBA.
- 5" traveling ports to support wires and probes on the test pieces that will move with the transfer basket.
- WEBSeason 10" tablet controller for easy operation.
- Simpati software for remote programming, monitoring, and control.
- Thermal shock-specific software comes pre-programmed with baseline thermal shock programs.
- Energy-saving mode for up to 40% energy savings and reduced operational costs.