

Weiss Technik designs solar simulation chamber for testing full-sized vehicles

WHY

A global automotive manufacturer needed a controlled environment to replicate real-world solar and environmental conditions for full-vehicle testing.

HOW

Weiss Technik designed a custom-built drive-in chamber to simulate full-spectrum solar irradiance and environmental conditions.

WHAT

A high-capacity, temperature/humidity chamber with integrated solar simulation and external support frame was deployed to test the effects of sun exposure.

WHY - the challenge.

When a leading global automaker faced the task of testing their vehicles for solar heat and light exposure over extended periods, they turned to the Weiss Technik team for a solution. The challenge was not just about simulating the intense solar and climatic conditions, but also about accommodating the size and weight of full-sized vehicles.

In the automotive industry, validating the durability and performance of vehicles under such extreme conditions is crucial. The automaker needed a testing solution that could reliably reproduce these conditions in a repeatable, controllable indoor environment.

HOW - the idea.

The concept centered around creating a walk-in environmental chamber spacious enough to house entire vehicles, with precise temperature, humidity, and solar irradiance controls. A major innovation involved integrating a full-spectrum solar simulation system, that could replicate irradiance levels between 600 and 1,200 W/m². This enabled the customer to assess how solar radiation affects vehicle components, materials, and overall thermal performance, all within a single, unified test platform.



Case Study

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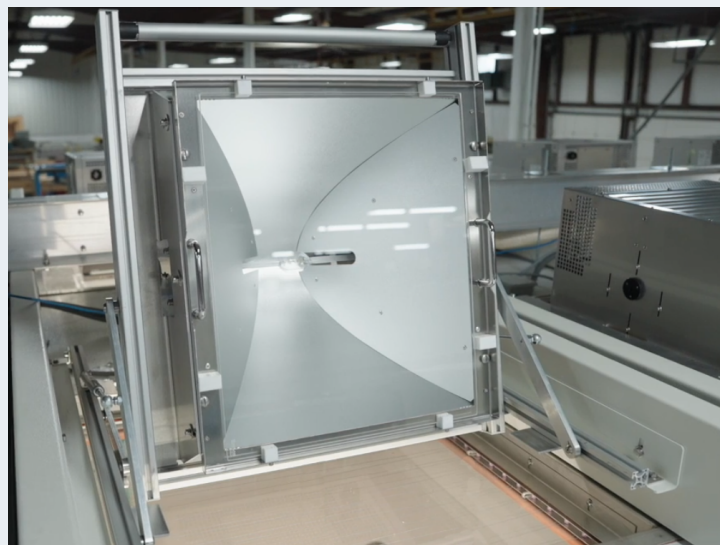
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WHAT - the solution.

The Weiss Technik team delivered a custom-built Panelized Drive-In Chamber, designed to meet the automaker's rigorous testing requirements. This chamber was equipped with a robust fabricated steel floor structure, rated to support up to 6,000 lb/ft², ensuring it could accommodate full-sized vehicles with ease.

The chamber's advanced features included integrated humidity control and precise temperature regulation, ranging from -65°C to +85°C. Additionally, 14 ceiling-mounted window ports were installed to house a solar luminary array, providing the necessary solar irradiance for testing.

An external support frame was incorporated to hold the solar array, and all utilities were designed to conform to ISO standards, ensuring seamless integration with the customer's facility. This innovative chamber allowed the automaker to conduct rigorous solar testing indoors, significantly enhancing test accuracy, repeatability, and operational efficiency.



Special Features

- Full-spectrum solar simulation from 600 to 1,200 W/m²
- Large interior workspace: 132"W x 312"D x 126"H
- Floor rated at 6,000 lb/ft² with thermal isolation and drainage slope
- Operational temperature range: -65°C to +85°C
- Fourteen (14) solar array windows integrated into the chamber ceiling
- External support structure for light arrays to reduce heat load on the ceiling
- Controlled via Weiss Technik WEBSeason system for precision and automation
- Compliance with ISO compressed air and drainage specifications