



Mini Cube (Accelerated Life Testing Lab) Testing of automotive components

The test in a nutshell



Test duration
(days / months)



Cooling
capacity

terraXcube

terraXcube is Eurac Research's extreme climate simulation centre at the NOI Techpark in Bolzano, South Tyrol, Italy. Within its chambers, even the most extreme of all our Planet's environmental conditions can be created. By combining hypobaric and altitude technology with state-of-the-art environmental simulation, we aim to investigate the effects of extreme climate conditions on humans, ecological processes and industrial products.

The climate chambers differ in size and equipment and can accommodate people, plants and other living organisms for up to extended periods and have the space to accommodate large machines and products.

Each day our team breaks new ground with scientists and industry partners and prepares the path to gain discoveries.

Test description

The aim of the test is to check the response of automotive industry components to frequent and prolonged thermal stress. The test object is a plastic component that is placed in the climate chamber, connected to the power supply and the external communication ports to monitor its functionality.

The component is then subjected to several freezing and thawing cycles over several weeks, with the temperature in the chamber varying between -40°C to $+60^{\circ}\text{C}$ according to a predefined agreement with the customer.

At regular intervals, the component is subjected to visual and instrumental tests. Deformations caused by continuous fluctuations to external temperature and exposure are assessed and the tightness of the joints is monitored. In addition, the functionality of any internal active components is evaluated.

Upon customer request, thermographic analysis can be carried out to highlight any anomalies in distribution of temperature within the component.

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Mini Cube (Accelerated Life Testing Lab) - General Characteristics and Environment Control

Internal dimensions	1.30 m x 1.52 m x 2.20 m (L x W x H)
Load Capacity	Objects up to a total weight of 300 kg
Temperature Range <small>According to IEC 60068-3-5</small>	-40...+90°C (variability $\pm 1^\circ\text{C}$ in time $\pm 2^\circ\text{C}$ in space)
Temperature Rate of Change <small>According to IEC 60068-3-5</small>	1.7°C/min (-40...+85°C), 1.7°C/min (+85...-0°C), 1°C/min (+0...-40°C)
Relative Humidity <small>+10 °C < T < +90°C and according to IEC 60068-3-6</small>	20...95% (variability $\pm 5\%$ in time $\pm 5\%$ in space)

Other Features

Power supply	230Vac 1~ 50Hz, 32 A; 400Vac 3~ 50Hz, 125A
Data-acquisition equipment	
Network connection	Gigabit-Ethernet (1000BaseT) PoE, Wi-Fi