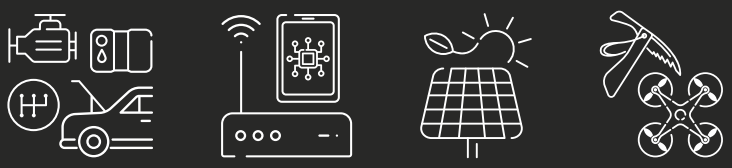
Photo: Eurac Research/Annelie Bortolotti

USE CASE

Mini Cube: testing components efficiently

Where everything is contained within



terra X cube
eurac research

Use case / Rev. 1 / Feb. 2024

terraXcube

terraXcube is Eurac Research's extreme climate simulation center at the NOI Techpark in Bolzano, South Tyrol, Italy. Within its chambers, even the most extreme environmetal conditions on our planet 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.

To test smaller components under extreme climatic conditions, you don't need large rooms; our Mini Cube has sufficient capacity to test a vast range of parameters, from weathering tests to performance trials.

Long-term weathering tests

In the Mini Cube, components can be subject to multiple freeze and thaw cycles over days, weeks and even months. The chamber temperature can vary between -40 °C and +90 °C depending on customer requirements and hot and humid climatic conditions can also be simulated. Long-term tests simulating the ageing processes of devices and components as well as their lifespan are a particularly useful feature of our Mini Cube. Upon customer request, the components to be tested can be subject to both visual tests and tests whereby measuring instruments evaluate parameters such as any elastic and plastic deformation, integrity of connections, functionality of all active internal components, as well as temperature distribution within any given component. Components for the automotive and the e-mobility industry such as gasoline tanks and charging stations for electric cars have already been successfully tested.

Short-term performance tests

The Mini Cube is also suitable for performance tests to ascertain functionality of a device in conditions ranging from extreme cold to extreme heat with high humidity. During the test, the temperature is monitored at various points on the device. This identifies which areas are particularly temperature sensitive. As a result, heating and cooling systems can be optimized. At the customer's request, long-term tests can also be carried out to identify any aesthetic or functional alterations to the entire product or individual components.

The test in a nutshell:

Measures:

The Mini Cube is located in the laboratories of Eurac Research's Institute for Renewable Energy in the NOI Techpark. The internal dimensions are: 1.30 m x 1.52 m x 2.20 m (L x W x H).
Objects up to a total weight of 300 kg can be tested.
The temperature range inside the Mini Cube is -40°C and +90°C (± 1°C in time ± 2°C in space) according to IEC 60068-3-5:2018.

Accredited tests:

Tests accredited by Accredia according to the following standards:
CEI EN 60068-2-1:2007, IEC 60068-2-1:2007
Environmental testing - Cold
CEI EN 60068-2-2:2008, IEC 60068-2-2:2007
Environmental testing - Dry heat

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Technical data:

Temperature: -40...+90°C

Temperature rate of change: 1.7°C/min (-40...+85°C), 1.7°C/min (+85...-0°C), 1°C/min (+0...-40°C)

Relative humidity: 20...95%

Dew Point Range for Continuous Tests: +2...+89°C

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