Photo: Schirra/Giraldi

USE CASE

Rescue and survival at extreme altitudes

Tests to optimize procedures, equipment and behavior under the most adverse conditions.

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.

Photo: Eurac Research/Annelie Bortolotti

Extreme altitude affects human performance, even more so when combined with adverse weather conditions. When this happens, rescue operations are compromised, and human lives at stake – both those of the people to be rescued and the rescuers themselves.

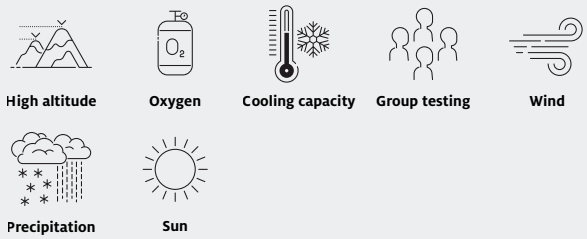
In the Large Cube, rescue teams can train for rescue missions at simulated extreme altitudes and in extreme weather conditions such as freezing cold, snow and gale-force winds.

Under conditions such as these, rescue teams can practice resuscitation techniques and optimize equipment, procedures and modify reactions to extreme situations. Mountaineers and extreme athletes can train in the simulated conditions of their planned expeditions and challenges and prepare for upcoming challenges.

In the simulated conditions of the terraXcube, it is also possible to observe decline in physical performance due to altitude and the associated physiological reactions.

In addition to simulating extreme altitudes of up to 9000 meters as well as extreme weather phenomena, long-term tests are also possible in the Large Cube. The maximum number of participants for tests is 15.

The test in a nutshell:



Measures:
The interior dimensions of the Large Cube are 12 m × 6 m × 5 m (L x W x H). The total available area is 137 m² plus 100 m² for test set-up. The entrance to the test chamber is formed by a wing gate with the dimensions: 3.6 m × 4 m (W x H). The maximum size of the test object can be 10 m x 3.6 m x 4 m (L x W x H).

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
IEC 60068-2-13:2021 Environmental testing:
Low air pressure,
IEC 60068-2-39:2015, CEI EN 60068-2-39:2016
Environmental testing: Temperature and low air pressure

ilac-MRA
ACCREDIA L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N° 1785L

Technical data:

Temperature: -40...+60°C
Relative humidity :10 % – 90 %rH
Maximum simulated altitude: 9000 m
Air pressure: 95 kPa – 33 kPa
Wind: 0 m/s – 30 m/s

Contact:
T +39 0471 055 550 – terraxcube@eurac.edu
terraxcube.eurac.edu