

60°C

GOING TO

cube  
engineered by  
regineerin

888	°C
888	% r.H.
888	mbar
888	m
888	%
888	ppm
888	m/s

EDITED BY AMIT KATWALA & GIAN VOLPICELLI

START

7

terraXcube is an environmental simulation centre that can replicate temperatures ranging from -40°C to 60°C. Its concrete chambers are reinforced with steel walls, extra-thick windows and pressure-tight doors designed to withstand harsh testing.

-40°C

# EXTREMES

**Bolzano in Italy's mountainous South Tyrol** province might have distinctly hot summers and cold winters – at least by Italian standards – but it never truly experiences extreme weather conditions. However, at the city's NOI Techpark, the mercury can shoot from as low as -40°C to as high as 60°C on consecutive days – and to order.

These massive temperature fluctuations occur within the confines of

The facility has six test chambers of three different sizes, which are fitted out with sophisticated hypobaric, altitude and environmental simulation technology, including systems for making varying intensities of rain, snow and wind, as well as temperature and humidity controls. Additionally, air pressure can be decreased to as low as 300mbar to replicate high-altitude conditions, while the lights can be boosted or dimmed to simulate day and night. “We can reproduce the hardest and most extreme parameters of the world in these chambers,” says Christian Steurer, the head of terraXcube.

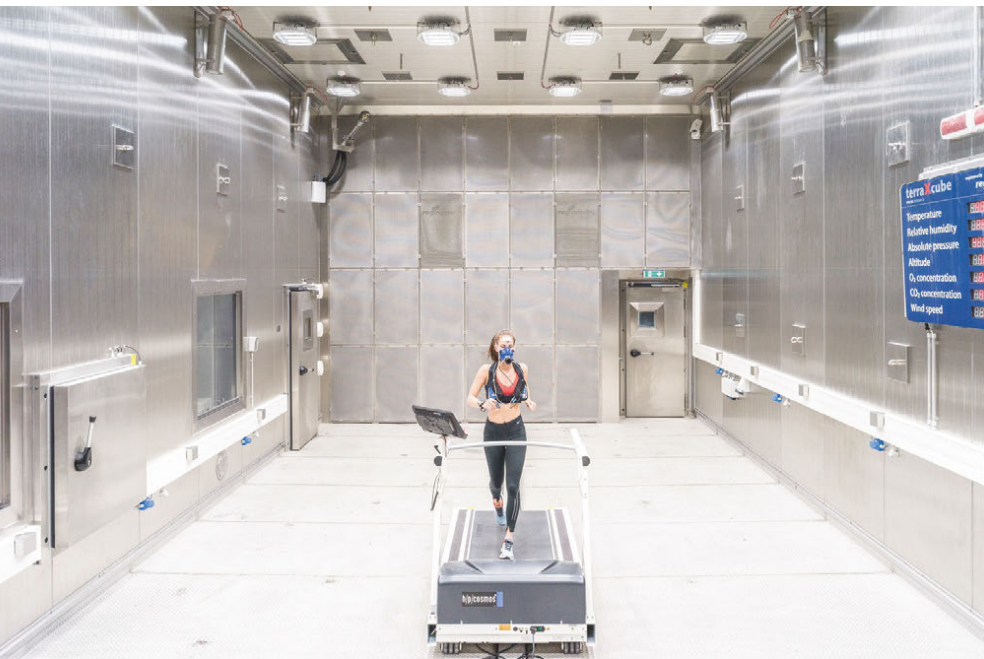
Since its launch in 2019, terraXcube has been harnessed for a variety of purposes, from medical research to industrial testing. For instance, scientists have used the facility to study the physiological effects of hypoxia

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Individuals ranging from athletes to pilots step into terraXcube to acclimatise to altitude or climate.

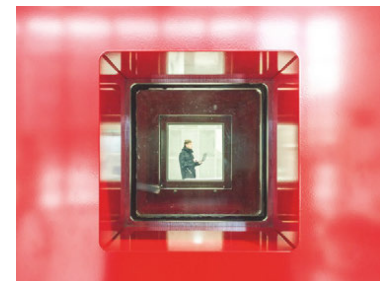
subjects have to be closely monitored.

“When it comes to scientific research and testing, it is extremely important to be able to reproduce ambient conditions or adjust specific parameters,” says Steurer. “While there are other climate chambers elsewhere, they do not enable you to change many different parameters at the same time. terraXcube's infrastructure is unique in the world.”  
**Delle Chan** [terraxcube.eurac.edu](http://terraxcube.eurac.edu)



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A technician inspects a chamber during pressurisation – simulated altitudes can change at six m/s.



terraXcube, an environmental simulation centre that can replicate an array of drastically different climatic conditions – from severe blizzards to torrential rain to parching desert heat – at the push of a button. The aim? To investigate the effects of extreme environments on whatever you place inside: humans, plants, machines and more.

terraXcube is the brainchild of Hermann Brugger, the founder of the Institute for Emergency Mountain Medicine at Eurac Research, a private research centre in Bolzano. Frustrated by the safety risks, logistical difficulties and hefty costs of conducting experiments at high altitudes, he began dreaming about an environmental simulator that would allow for safe, repeatable and controlled test conditions – and thus terraXcube was born.

on humans, while private companies have conducted environmental stress tests on products ranging from drones to tractors. In addition, the centre provides a carefully controlled training environment for individuals who need to acclimatise to high altitudes, such as mountain rescuers, engineers and even adventurers preparing for their next expedition. Safety is also paramount: test

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Members of a rescue team brave a simulated snowstorm and practise intubating a plastic medical dummy

