

ESA's Large Space Simulator

An external view of Europe's largest vacuum chamber, the Large Space Simulator, which subjects entire satellites to space-like conditions ahead of launch. This 15 metre-high and 10 metre-diameter chamber is cavernous enough to accommodate an upended double decker bus, it has been report.

Satellites are lowered down through a top hatch. Once the top and side hatches are sealed, high-performance pumps create a vacuum a billion times lower than standard sea level atmosphere, held for weeks at a time during test runs.

A 121-segment mirror array reflects simulated sunlight into the chamber, at the same time as the internal walls are pumped full of -190°C liquid nitrogen, together recreating the extreme thermal conditions prevailing in orbit.

Embedded sensors and measurement devices check whether a mission's thermal engineers have done their job well, and if the test satellite maintains an acceptable internal temperature range without buckling or other unwanted temperature-driven effects.

The simulator is an essential part of ESA's Test Centre in the Netherlands, the largest facility of its kind in Europe, providing a complete suite of equipment for all aspects of satellite testing under a single roof.

Picture caption

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