Center for Nanosatellite Testing
Kyushu Institute of Technology

The first facility dedicated to comprehensive nanosatellite testing

Kyushu Institute of Technology established the Center for Nanosatellite Testing (CeNT) in 2010. CeNT is comprised of facilities specialized in space environmental testing for a nanosatellite up to 50-cm and 50-kg. To verify operation in the extreme space environment, various environmental tests are required. There has been no single test facility capable of providing all needed environmental tests for nanosatellite developers -- making entry into the space sector via nanosatellites difficult. CeNT has test facilities for thermal shock, out-gas measurement, thermo-optical measurement, vibration, antenna pattern, thermal vacuum, thermal cycle, and more. Conducting these various tests in one place not only saves time but also provides the traceability and consistency of data.

We can do all the environmental tests for a satellite up to 50 cm

Thermal environment testing

In the space environment every satellite undergoes extreme thermal cycling, ranging ±100℃. Various types of thermal environment tests are necessary to confirm whether a satellite can function properly in orbit. At CeNT, facilities for vacuum thermal shock, thermal vacuum and equilibrium, thermal cycle, and thermo-optical property measurement are available.

Vacuum thermal Shock chamber

-150℃～+150℃ 1×10⁻⁵ Torr or less
Verifying operation in vacuum at high and low temperatures

Thermal vacuum chamber

Thermal cycling

Small -150℃～+150℃ Large
Accelerated test on repetition of high and low temperatures

Thermo-optical measurement

Evaluation of characteristics of thermal controlling material

EMC

It is necessary to measure the antenna radiation pattern to confirm that the satellite can communicate with its ground stations. It is also necessary to carry out electromagnetic compatibility (EMC) test to confirm that the satellite can withstand the electromagnetic environment produced by itself and others.

Antenna pattern measurement

Electromagnetic Compatibility

Outgas Measurement

In orbit or during launch, outgassing may be harmful to onboard instruments or other satellites sharing the launch. The outgas property of material samples can be measured according to ASTM E-595 standard.

Out gas measurement system

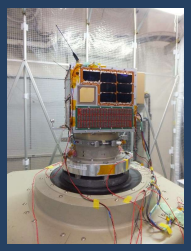
Vibration・Shock Test

It is necessary to confirm through vibration and shock tests that a satellite can mechanically survive the intense vibration and shocks during launch.

Shock test

Max 4000G

Vibration test



50kg,Max 15G

Test as you build

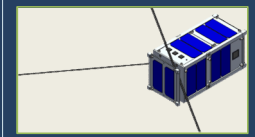
CeNT aims to develop test and verification methods suitable for nanosatellites. We strive for the optimum balance between goals of low-cost, fast-delivery and high-reliability. The central objective is to establish international standards for nanosatellite-related technologies, which will help space entrants all over the world. Standards also promote the growth of the small satellite industry on a global scale.

Test History

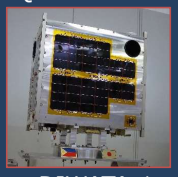
Horyu4

QSAT-EOS

Hodoyoshi-3



AOBA-Velox-Ⅲ



DIWATA-1

STARS-Ⅱ

In total, since 2009,
we have tested 31 nanosatellites as of July 2016.

For further infomation

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