

# **NANOSTRUCTURE 6U MK2**

Qualification Certificate

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1.0	2024-11-01	JARI	Initial revision

**References**

Reference	Document title	Document number	Revision, Date
[RD-1]	GomSpace Qualification Program	1012670	Rev. 2.3, 2023-03-24
[RD-2]	gs_qtrp_NanoStructure-6U-mk2-Mechanical_Vibration_Report	1062513	Rev 1.0, 2024-10-28
[RD-3]	gs-ts-6U Shock Test Report	1032992	Rev 2.0, 2024-04-17
[RD-4]			

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## 1. Qualification Tests

### 1.1 Purpose

This document describes the environmental qualification tests which is carried out on this specific product. In the following sections, the tests and the corresponding test results are summarized.

### 1.2 Product

Manufacturer Name: GomSpace  
Product Name: NanoStructure 6U MK2  
Product Number: 107861

Please note that Thermal Vacuum test and TID test is not performed on the NanoStructure 6U MK2.

### 1.3 Vibration Tests

The product has been subjected to the following tests.

**Tests:** Random Vibration  
Sinusoidal Vibration  
Quasi-static / Sine burst

**Conditions:** The product is loaded with dummy masses and inserted inside a GomSpace Qualification POD.  
The dummy masses are evenly distributed in the structure and gives a final mass of 10765 grams.  
The product is tested under the following test conditions.

Test Description	Test Conditions
Random Vibration	20Hz, 0.026G2/Hz 20-50Hz, +6 dB/oct 50-800Hz, 0.16G2/Hz 800-2000Hz, -6 dB/oct 2000Hz, 0.026G2/Hz Overall, 14.1Grms
Sinusoidal Vibration	5-8Hz, 10mm pp 8-100Hz, 4.5G
Quasi-static / Sine burst	30Hz, 15G, 19 cycles / 7 loaded cycles

**Remarks:** For details see the vibration test report, [RD-2]

**Conclusion:** The NanoStructure 6U MK2 is tested according to the above-mentioned conditions. The visual mechanical inspection and electrical / functional tests are passed. This certificate ensures that performance, test condition and test equipment are according to GomSpace quality.

## 1.4 Shock Tests

The product has been subjected to the following tests.

**Tests:** Shock

**Conditions:** The shock test is performed in a campaign, where the structure is loaded with several GomSpace products. The structure is installed in GomSpace Qualification POD and mounted in the shock bench. The device is exposed to two impacts at each axis, X, Y and Z. It is tested under the following test conditions.

Test Description	Test Conditions
Shock Response Spectrum (SRS):	100Hz, 40G 1000Hz, 1000G 2000Hz, 1500G 10000Hz, 1500G ±6dB from the nominal shock 50% of the measured shock shall be above nominal shock

**Remarks:** For details see the shock test report, [RD-3]

**Conclusion:** The NanoStructure 6U MK2 is tested according to the above-mentioned conditions. The visual mechanical inspection and electrical / functional tests are passed. This certificate ensures that performance, test condition and test equipment are according to GomSpace quality.

## 1.5 Flight Heritage

The design of the NanoStructure 6U MK2 (part number 107861) is an update of the NanoStructure 6U (part number 200280), which has extensive flight heritage in several customer missions.

The NanoStructure 6U was designed for the GOMX-4 mission, which was in orbit from February 2018 to August 2024.

The changes implemented in the MK2 version are

- Compatibility with new GomSpace products
- Added mounting holes for external ground support equipment
- Update of materials and surface finish to improve the properties.

Since the NanoStructure 6U MK2 has not been launched in space yet, the TRL is set to 8.

The first launch is currently scheduled for Q1/Q2 2025.