ESA-VSC LABORATORIES

(VALENCIA-SPAIN)

VACUUM AND THERMAL CHAMBERS

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ESA-VSC EUROPEAN HIGH POWER SPACE MATERIALS LABORATORY

VACUUM CHAMBER: VENTING

CHAMBER DIMENSIONS (INTERNAL):

- Diameter: 200 mm
- Depth: 1200 mm

LEAK RATE ACCURACY:

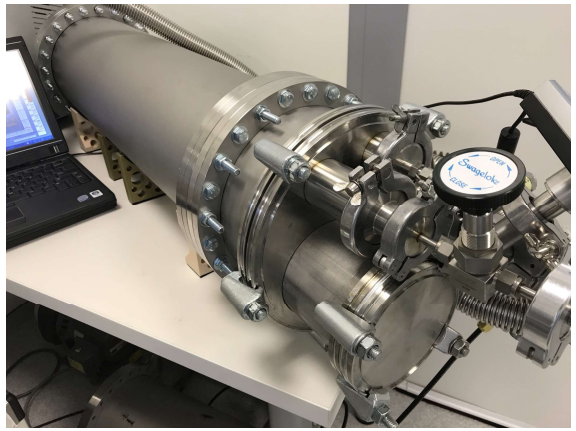
- $1 \cdot 10^{-12}$ mbar·L/s

TEMPERATURE:

- Room temperature

CHAMBER VERSATILITY:

- The chamber depth can be adjusted from 400 mm to 1200 mm.
- Overpressure up to 3 bar.



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VACUUM CHAMBER: OUTGASSING

CHAMBER:

- Up to 5 different materials can be measured simultaneously.

PRESSURE RANGE:

- 10^{-5} mbar compliant with ECSS stardard

TEMPERATURE RANGE:

- From +20°C to +170°C in the hot plate.
- The test temperature is at +125°C compliant with ECSS standard.
- +25°C in the cold plate.

ULTRA HIGH MICRO BALANCE:

- Weights from 0,1 µg to 6 g.
- Accuracy 0,1 µg

INFRARED ANALYSIS FOR CONTAMINATION:

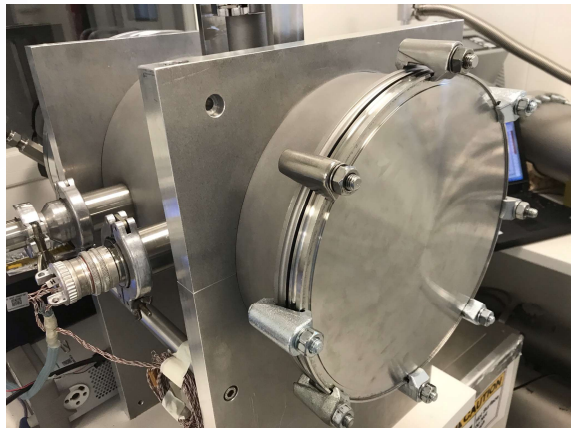
- Compliant with ECSS standard.

ATMOSPHERIC CABINET:

- Temperature and relative humidity compliant with ECSS standard.

ECSS STANDARD:

- ECSS-Q-ST-70-02C – Thermal vacuum outgassing test for the screening of space materials



ESA-VSC laboratories (Valencia,Spain) – Vacuum and thermal chambers

ESA-VSC EUROPEAN HIGH POWER SPACE MATERIALS LABORATORY

VACUUM CHAMBER: BAKE-OUT

CHAMBER DIMENSIONS (OVEN):

- Height: 900 mm
- Length: 1500 mm
- Components can be hanged.

PRESSURE RANGE:

- P < 10^{-5} mbar

TEMPERATURE RANGE (in the components):

- Maximum: +200 ºC
- Minimum: Room temperature

MONITORIZATION SYSTEMS:

- Two Thermal Quartz Crystal Microbalance (T = -20ºC)
- Residual Gas Analysis.
- Infrared analysis for contamination
- One Quartz Crystal Microbalance.

COLD TRAPS:

- First cold trap T < -100 ºC
- Second cold trap T ~ -10 ºC

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VACUUM CHAMBER: XPS and SEY for samples

CHAMBER DIMENSIONS:

- This chamber is designed for samples analysis: 1 cm^2 approximately.

PRESSURE ANALYSIS:

- Maximum: 10^{-7} mbar
- Minimum: 10^{-10} mbar

TEMPERATURE RANGE (in holder sample):

- Maximum: +300 °C
- Minimum: Room temperature

X-RAY PHOTOELECTRON SPECTROSCOPY:

- Al and Cu anodes.

SECONDARY ELECTRON EMISSION YIELD:

- Energy range: from 0 to 2000 eV.
- For metals and dielectrics.

Ar^+ BOMBARDMENT:

- Atomic surface cleaning.

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VACUUM CHAMBER: SEY for samples and devices

DEVICE DIMENSIONS:
- Width and Length: 400 mm
- Height: 200 mm

PRESSURE RANGE:
- Maximum: Atmospheric pressure
- Minimum: 10^{-8} mbar

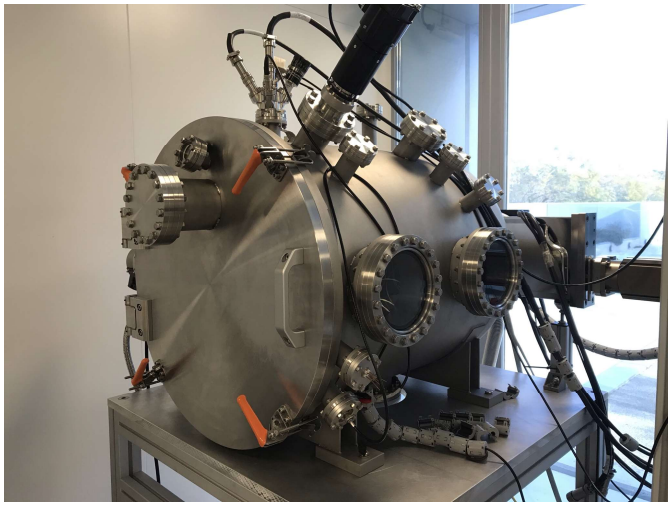
TEMPERATURE RANGE (in base-plate):
- Maximum: +300 ºC
- Minimum: -150 ºC

UV RADIATION:
- Deuterium lamp: 125 nm

SECONDARY ELECTRON EMISSION YIELD:
- E-gun with energy from 0 to 2000 eV
- E-gun with energy from 50 to 5000 eV
- For metals and dielectrics.

KELVIN PROBE ANALYSIS:
- Large areas
- Surface potential

OPTICAL INSPECTION:
- Optical microscope x1500
- CCD high resolution



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IMPORTANT:

ALL OUR THERMAL VACUUM CHAMBERS ARE INSTALLED IN CERTIFIED ISO 7 – 10,000 CLASS CLEAN ROOMS

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(VALENCIA-SPAIN)

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