



CRP TECHNOLOGY S.r.l.

Outgassing test reports

Windform LX 3.0 has passed ESA standard screening outgassing tests in accordance with ESA-TEC-PR-002015 (based on ECSS-Q-ST-70-02C). The test was conducted in the μ VCM facility of the TEC-QEE laboratory at ESA/ESTEC, Noordwijk, Netherlands.

Test Conditions

The μ VCM vacuum chamber is located in the outgassing lab Ek007a where the environmental conditions are controlled by ESTEC site service at 22 ± 3 °C and 55 ± 10 % RH.

Windform LX 3.0 was tested in accordance with ECSS-Q-ST-70-02C and it passed the general acceptance limits (RML < 1.0%, CVCM < 0.1%).

The test was performed on 3D printed samples, as per:

- Pre-test conditioning of the sample, 100-300 mg of material (unless mentioned otherwise), was 24 hours at 22 ± 3 °C and 55 ± 10 % RH.
- During the test for 24 hours:
 - o The sample was subjected to a temperature of 125 °C.
 - o The condensable material was collected by a collector plates kept at 25 °C.
 - o The test vacuum pressure was kept below 10⁻⁵ mbar.
- Post-test conditioning of the sample was 24 hours at 22 ± 3 °C and 55 ± 10 % RH.

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Sede Legale e Amministrativa/Headquarters and Administration Office

Via Cesare Della Chiesa 150/C - 41126 Modena

Tel./Phone +39-059-330544/821135/826025

Fax +39-059-822071/381148

C.F./ P.IVA/Registro Imprese Modena IT03344960368 (VAT number)

Capitale sociale Euro 80.000 i.v.



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Outgassing Test Results

Table 1. Sample mass measurements using external balance

Windform LX 3.0		TML [%]	CVCM [%]	RML [%]
		0.412	0.01	0.292
		0.410	0.01	0.293
		0.406	0.01	0.292
	Average	0.41	0.01	0.29
	SD	0.00	0.00	0.00
	Uncertainties k=2	0.02	0.02	0.02

Notes:

All uncertainties are representative of typical conditions. The uncertainties represent a coverage factor $k = 2$, corresponding to a 95 % confidence level. All measurements performed in the process of obtaining the results presented here are traceable.

The ESA standard outgassing tests can be considered passed for Windform LX 3.0 samples and they respond to the general outgassing criteria based upon the micro-VCM test (as defined by ECSS-Q-ST-70-02C).

The general requirement for materials screening outgassing is $RML < 1.0\%$ and $CVCM < 0.1\%$.

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