



TEST REPORT

TEST FOR THE DETERMINATION OF FLEXURAL AND COMPRESSIVE STRENGTH

1 | Identification

Name	LNEC/DE/NESDE
Address	Av. do Brasil, 101 1700-166 LISBON
Customer/applicant's order reference	DED/NCTC'S CONTRIBUTION TO THE "COLLECTION AND CONDUCT OF MECHANICAL CHARACTERISATION TESTS ON BEDDING MORTARS"

2 | Samples and sampling procedure

The sample of masonry mortar was taken on site by a technician from LNEC's Wall Coverings Unit (URPa) on 3 December 2025 at 09:30 am. The consistency of the sample was determined according to the standard EN 1015-3:1999 – Methods of test for mortar for masonry - Part 3: Determination of consistency of fresh mortar (by flow table) and the bulk density was assessed in accordance with standard EN 1015-6:1998 – Methods of test for mortar for masonry - Part 6: Determination of bulk density of fresh mortar. The sample was then cast into three metal moulds, each with three cavities measuring 160 mm × 40 mm × 40 mm, resulting in a total of nine test specimens. The average dimensions of the test specimens were 160.38 mm × 40.24 mm × 40.38 mm, intended for the tests to determine flexural strength and compressive strength. The sample and specimens identification are presented in Table 2.1.

Table 2.1 – Identification of the sample and test specimens

Sample description	Quantity	Test specimens
R5-M5-0%	6 kg	R5-M5-0%_1 to 9

3 | Tests carried out/Test conditions

3.1 Test Method

The tests to determine flexural and compressive strength were conducted at 14, 28 and 60 days of curing time at LNEC's Wall Coverings Unit (URPa), following the provisions of standard NP EN 1015-11:2019 – Test methods for masonry mortars – Part 11: Determination of flexural and compressive strength of hardened mortar.

Before testing, the specimens were placed at a temperature of 20 °C (+3 / -2 °C) and a relative humidity of 95 ± 5% for 48 hours. They were then demoulded and kept in the same conditions for an additional five days.

After this period, the specimens were placed at a temperature of 20 °C (+3 / -2 °C) and a relative humidity of 65 ± 5%. They were then subjected to flexural and compressive strength tests at the specified curing times.



TEST REPORT

For both the flexural and compressive strength, an ETI – HM-S/CPC universal testing machine from PROETI, S.A. was utilized. In the flexural test, a 2 kN load cell was used with a load application rate of 10 N/s. In the compression test, a 200 kN load cell was employed at a load application rate of 50 N/s.

4 | Results

Table 4.1 shows the flexural and compressive strength values obtained at the curing times of 14, 28 and 60 days.

Table 4.1 – Values obtained for flexural strength and compressive strength

Curing time	Specimens	Flexural strength		Compressive strength	
		Rupture force (N)	Stress (N/mm ²)	Rupture force (N)	Stress (N/mm ²)
14 days	R5-M5-0%_1	243	0.55	2176	1.36
				-	-
	R5-M5-0%_2	237	0.54	2093	1.31
				2226	1.39
	R5-M5-0%_3	283	0.65	2249	1.41
28 days				2257	1.41
	Average	254	0.58	2200	1.38
	Standard deviation	± 25	± 0.06	± 68	± 0.04
	R5-M5-0%_4	467	1.06	-	-
				3076	1.92
60 days	R5-M5-0%_5	494	1.17	3264	2.04
				3722	2.33
	R5-M5-0%_6	422	0.98	4028	2.52
				4024	2.52
	Average	461	1.07	3623	2.26
	Standard deviation	± 36	± 0.10	± 437	± 0.27
	R5-M5-0%_7	542	1.27	4482	2.80
				4114	2.57
	R5-M5-0%_8	485	1.16	3728	2.33
				4113	2.57
	R5-M5-0%_9	473	1.09	3947	2.47
				4418	2.76
	Average	500	1.18	4134	2.58
	Standard deviation	± 37	± 0.09	± 284	± 0.18

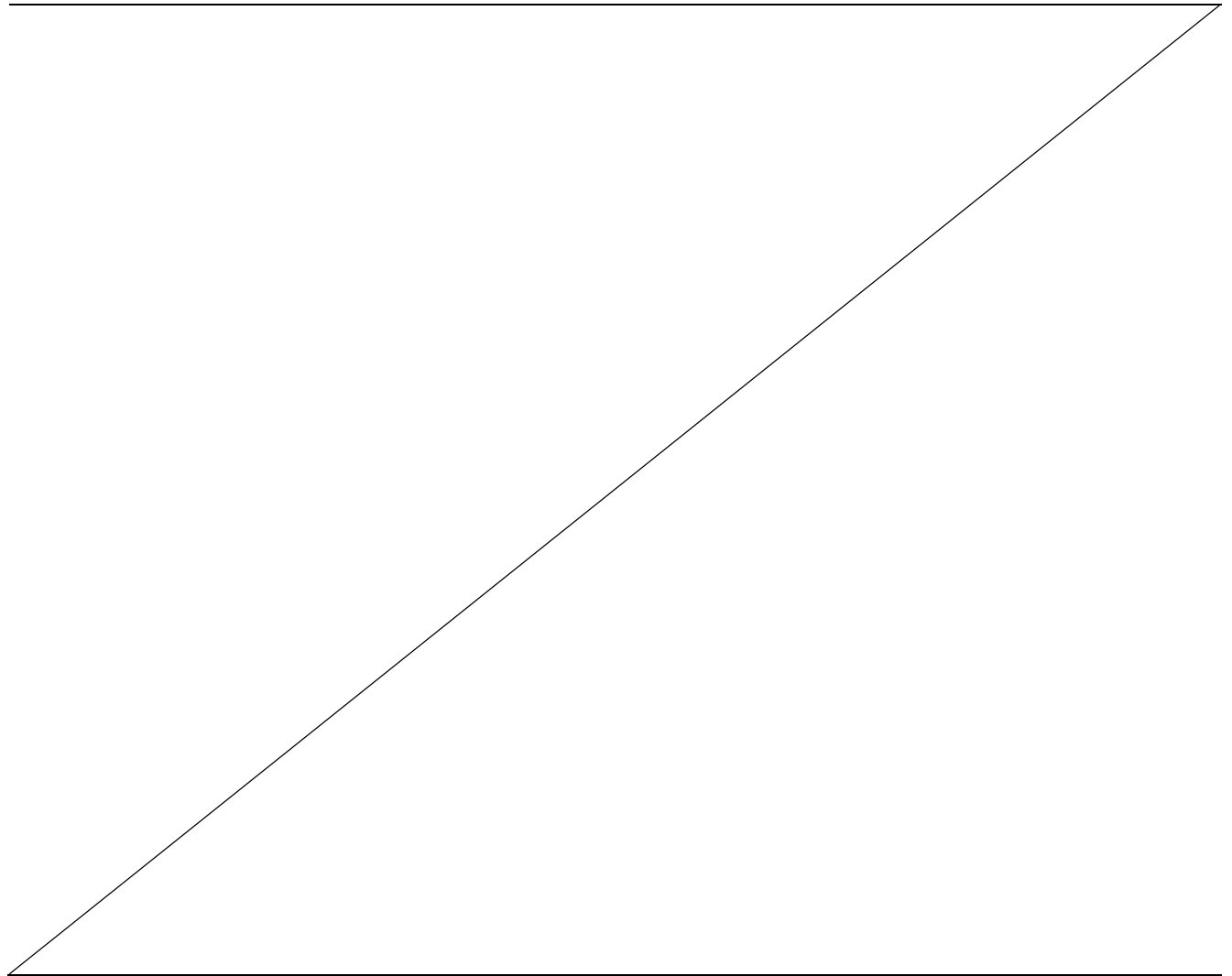


Report no.	08/2026 - URPa
Pp.	3/3
File no.	0803/1101/2309503
Order no.	R1/2026

TEST REPORT

5 | Comments

The results obtained in this test are part of the study on the mechanical characterisation of mortars conducted for LNEC/DE/NESDE.



Lisbon, LNEC, 6 March 2026

TESTED BY

Anabela Manteigas

HEAD OF URPa

M. do Rosário Veiga

Authorized by

M. do Rosário Veiga

Head of NCTC