



Report no.	04/2026 - URPa
Pp.	1/3
File no.	0803/1101/2309503
Order no.	R1/2026

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 masonry mortars' mixing was carried out by the client under the supervision of a technician from LNEC's Wall Coverings Unit (URPa) on 10 November 2025 at 2:00 pm. For this mixing a pre-measured mortar mix with 10% added sand was placed in the laboratory mixer's container, following the provisions of Standard EN 1015-2: 1998 – Methods of test for mortar for masonry - Part 2: Bulk sampling of mortars and preparation of test mortars. The mixer was then started in automatic mode at a relatively low speed. During the first 30 seconds, whilst the mixer was running, water was poured into the container. After two and a half minutes, the mixer was stopped and the material was mixed manually with a trowel, scraping the sides of the container to ensure a homogeneous mixture. The mixer was then switched on again at the same speed for an additional 30 seconds. The mortars' consistency 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 160.20 mm × 40.10 mm × 40.91 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
RE-M5-20%	6 kg	RE-M5-20%_1 to 6



TEST REPORT

3 | Tests carried out/Test conditions

3.1 Test Method

The tests to determine flexural and compressive strength were conducted at 7 and 28 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.

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 60 N/s.

4 | Results

Table 4.1 shows the flexural and compressive strength values obtained at the curing times of 7 and 28 days.

Table 4.1 – Values obtained for flexural strength and compressive strength

Curing time	Specimens	Flexural strength		Compressive strength	
		Rupture force	Stress	Rupture force	Stress
		(N)	(N/mm ²)	(N)	(N/mm ²)
7 days	RE-M5-20%_1	186	0.42	1485	0.93
				1495	0.93
	RE-M5-20%_2	200	0.45	1358	0.85
				1698	1.06
	RE-M5-20%_3	199	0.44	1392	0.87
				1630	1.02
Average		195	0.44	1510	0.94
Standard deviation		± 8	± 0.02	± 132	± 0.08
28 days	RE-M5-20%_4	396	0.90	2928	1.83
				3552	2.22
	RE-M5-20%_5	431	1.00	-	-
				2950	1.84
	RE-M5-20%_6	416	0.95	3071	1.92
				3639	2.27
Average		414	0.95	3228	2.02
Standard deviation		± 18	± 0.05	± 341	± 0.21

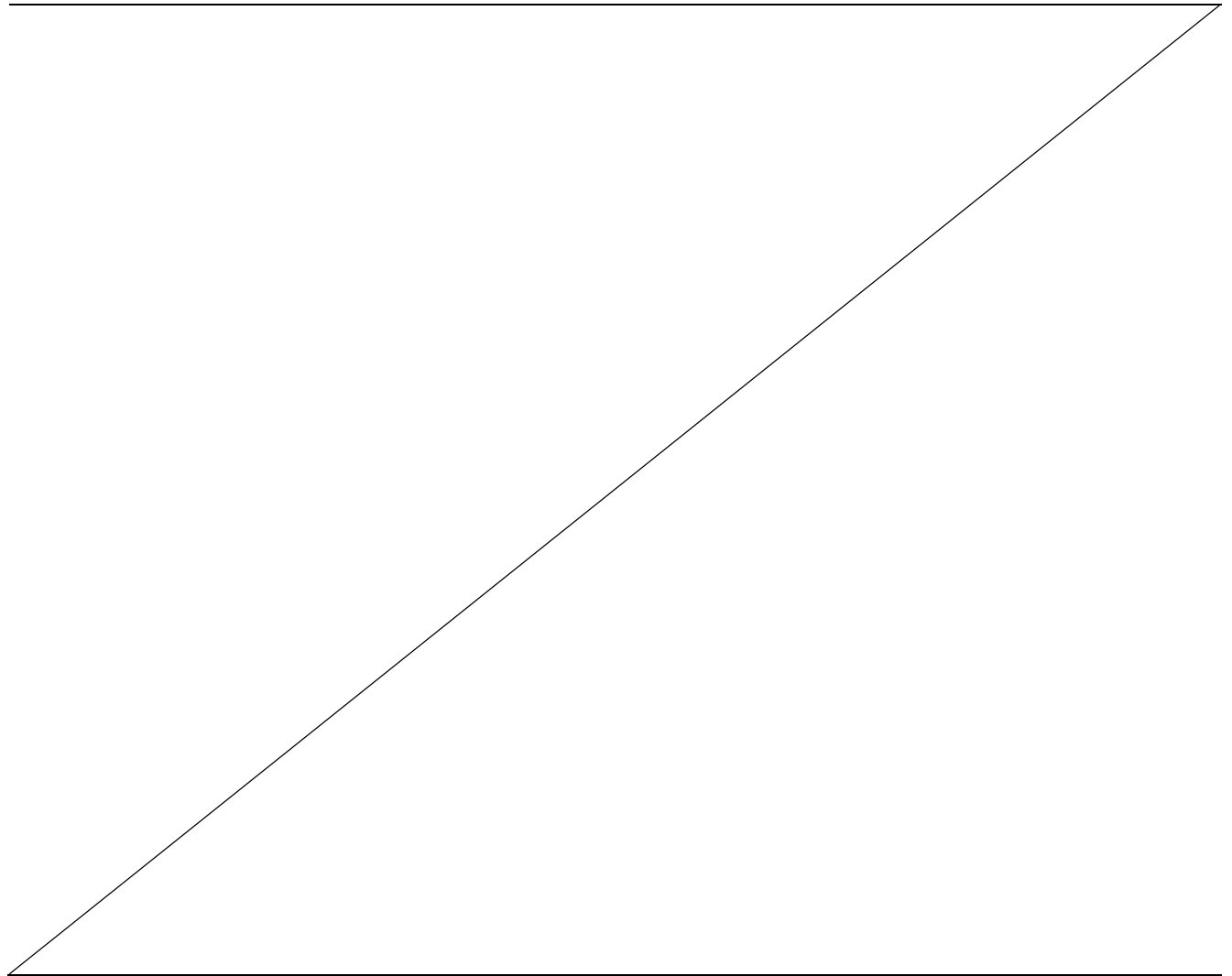


Report no.	04/2026 - URPa
Pp.	3/3
File no.	0803/1101/2309503
Order no.	R1/2026

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