



Report no.	03/2026 - 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 159.96 mm × 40.13 mm × 40.41 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-M5-15%	6 kg	RE-M5-15%_1 to 6



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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-M5-15%_1	253	0.58	1966	1.23
				2366	1.48
	RE-M5-15%_2	270	0.61	2279	1.42
				2113	1.32
	RE-M5-15%_3	238	0.55	2209	1.38
				2308	1.44
Average		254	0.58	2207	1.38
Standard deviation		± 16	± 0.03	± 147	± 0.09
28 days	RE-M5-15%_4	560	1.28	4425	2.77
				4544	2.84
	RE-M5-15%_5	599	1.32	4975	3.11
				3475	2.17
	RE-M5-15%_6	599	1.36	4279	2.67
				-	-
Average		586	1.32	4340	2.71
Standard deviation		± 23	± 0.04	± 549	± 0.34

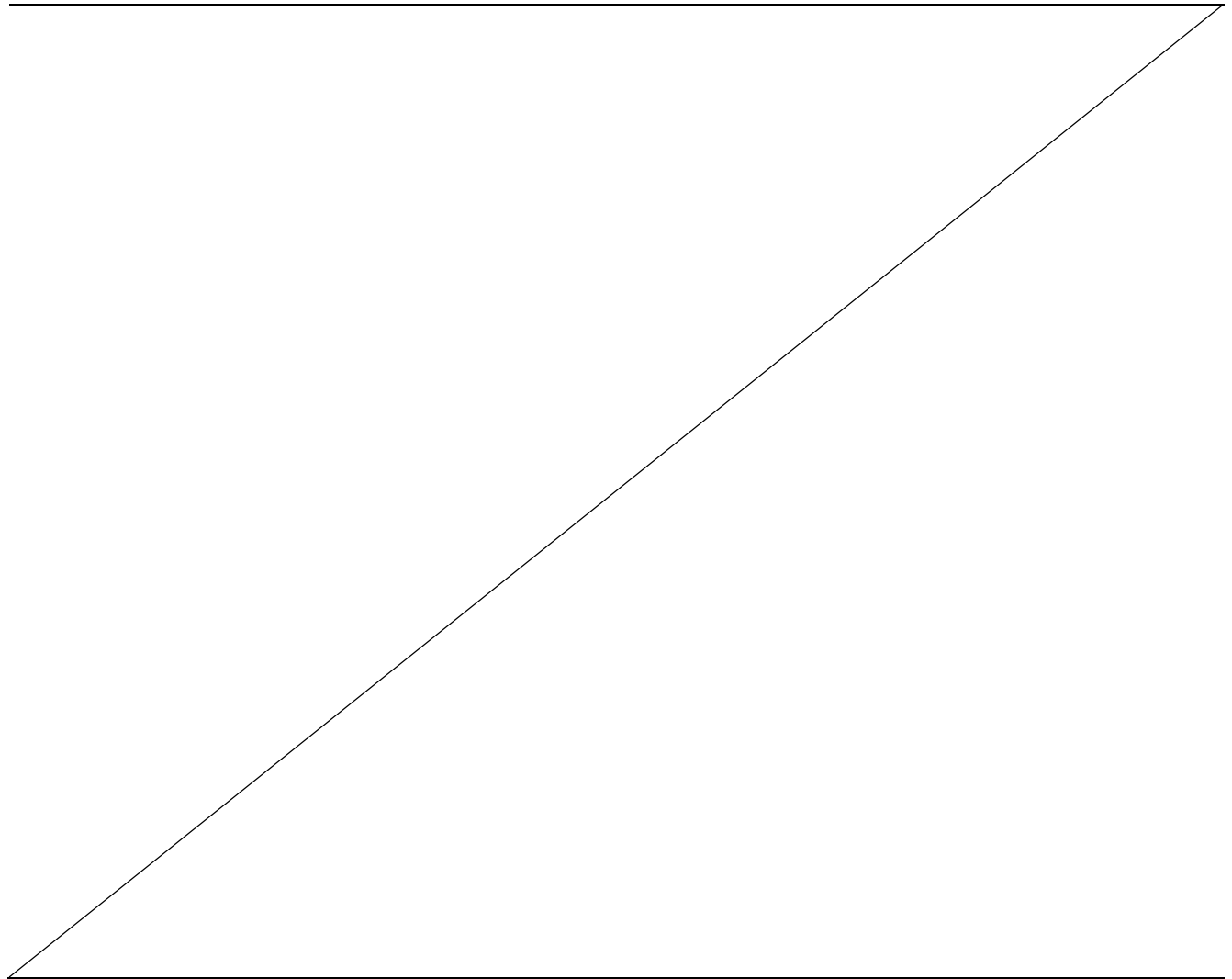


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5 | Comments

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

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HEAD OF URPa

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Authorized by

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Head of NCTC