

Bellaterra : 22nd November 2024
Report number : **24/32307045**
Petitioner Reference : **CURMAX HB Ltd**
3 Ha'Melacha Street
00000 Nesher (Israel)

TEST REPORT

RECEIVED MATERIAL:

On 03rd September 2024, a coating for the protection and repair of concretes structures, was received at Applus Laboratories, with the following references:

CURMAX B1

REQUESTED TESTS:

PRODUCTS AND SYSTEMS FOR THE PROTECTION AND REPAIR OF CONCRETE STRUCTURES. Definitions, requirements, quality control and evaluation of conformity. UNE-EN 1504-2:2005 Part 2: Surface protection systems for concrete

- 1- Measurement of bond strength by pull-off , EN 1542
- 2- Determination of water-vapour transmission properties, EN ISO 7783
- 3- Determination of liquid water permeability, EN 1062-3
- 4- Abrasion resistance (Taber), EN ISO 5470-1
- 5- Abrasion resistance, ASTM D4060
- 6- Total absorption, ASTM C97
- 7- Determination of resistance to salt crystallisation, EN 12730

TEST DATE: From 03/09/2024 to 21/11/2024

RESULTS : See attached pages.

Responsible for Construction Materials
LGAI Technological Center S.A.

Technical Manager
LGAI Technological Center S.A.

The results included in this document refer exclusively to the indicated materials and has been tested according to the specifications given.

The reproduction of this document is only authorised if it is made in its totality. Electronically signed reports in digital format are considered original documents, as well as its electronic copies. Their printing has no legal validity.

Page 1 – The present document consists of **6** pages long, whereof **0** are appendixes

Report number	24/32307045	Page	2
CURMAX HB Ltd		CURMAX B1	

RESULTS:

Consumption: 0,25 kg/m² per layer (2 layers, 1st diluted 50% with water)

1- Measurement of bond strength by pull-off , EN 1542

The reference samples, are 300 x 300 x 100 mm specimen, with a maximum aggregate size of 8 mm or 10 mm and prepared with a grit-blasted surface, according to EN 1766 (MC 0,40).

The specimens were preserved in the laboratory covered with a plastic film for 72 hours and after that, they were conserved 21°C - 60% RH for 25 days.

There were No bubbles, cracks or surface defects after curing.

Specimen	Tensile strength (N/mm ²)	
1	3,31	(A)
2	3,28	(A)
3	3,16	(A)
4	3,27	(A)
5	3,41	(A)
Average	3,3	MPa

NOTE: Mode of failure is shown between brackets.

A: Cohesion failure in the concrete substrate

A/B: Adhesion failure between the substrate and product

B/C : Adhesion failure between the first and second layer

Requirements according to UNE-EN 1504-2:2005 Table 5			
Flexible Systems		Rigid Systems	
Without trafficking	With trafficking	Without trafficking	With trafficking
≥ 0,8 MPa	≥ 1,5 MPa	≥ 1,0 MPa	≥ 2,0 MPa

Report number 24/32307045	Page 3
CURMAX HB Ltd	CURMAX B1

2- Determination of water-vapour transmission properties, EN ISO 7783

- Three cylindrical test specimens have been prepared, approximate surface=0,0079 m² (100 mm diameter), to test with the substrate.
- After curing for 28 days in laboratory conditions, the test specimens undergo 3 cycles of immersion in water and drying.
- Site ambient conditions: 23°C and 50% R.H.
- Saturated solution in capsules: dihydrogen ammonium phosphate (93%RH).
- Pressure difference (Δp)= 1210 Pa.

To create an atmosphere of 93% R.H. inside the capsule, a saturated solution with dihydrogen ammonium phosphate is used, whereby a 50% humidity shall be maintained outside the capsule and 93% inside, thereby reducing the mass of the sample-capsule set.

Final results:

Test specimen	Water-vapour flow rate G (g/h)	Water-vapour transmission rate V (g/m ² * day)	Diffusion-Equivalent air layer thickness Sd (m)	Water vapour resistance factor μ
1	0,063	175,1	0,12	685
2	0,066	180,8	0,11	684
3	0,067	184,5	0,11	621
Average	0,065	180,1	0,11	664

Requirements according to UNE-EN 1504-2:2004 Table 5	
Class I (permeable to water vapour)	$Sd < 5 \text{ m}$
Class II	$5\text{m} \leq Sd \leq 50 \text{ m}$
Class III (dense against water vapour)	$Sd > 50 \text{ m}$

Report number	24/32307045	Page 4
CURMAX HB Ltd		CURMAX B1

3- Determination of liquid water permeability, EN 1062-3

Ceramic specimens have been used as the substrate: approximate size 150x150mm, 30 mm thick, density 1650 kg/m³ and liquid water transmission index 7,5 Kg/(m²·h^{0,5}).

After curing the product for 28 days in laboratory conditions, the test specimens undergo 3 water immersion and drying cycles, and a final drying.

Specimen	W (Kg/m ² h ^{0,5})
1	0,08
2	0,09
3	0,08
Average	0,08

Requirements according to UNE-EN 1504-2:2005 Table 4	
Capillary absorption and permeability to water	W < 0,1 Kg/(m ² * h ^{0,5})

4- Abrasion resistance (Taber), EN ISO 5470-1

Test conditions:

- Abraser: Taber 5150 Abraser - Weight: 1000 g
- Abrading wheel: H22

Specimen no.	Weight loss* (mg)		Mass variation (%)
	Reference sample (without product)	Sample with product	
1	1678	1123	33,1
2	1679	1103	34,3
3	1688	1120	33,6
Average	1682	1115	33,7

* After 170 cycles, there is no applied product left. So the weight loss is referred at 170 cycles.

Requirements according to UNE-EN 1504-2:2005 Table 4
At least 30 % improvement in abrasion resistance in comparison with a non impregnated sample

Report number 24/32307045	Page 5
CURMAX HB Ltd	CURMAX B1

5- Abrasion resistance, ASTM D4060

Test conditions:

- Abraser: Taber 5150 Abraser
- Abrading wheel: CS17
- Weight: 1000 g
- n° cycles: 500

Specimen no.	Weight loss (mg)	
	Reference sample (without product)	Sample with product
1	405	181
2	425	196
3	437	177
Average	422	185

6- Total absorption, ASTM C97

Specimen no.	Absorption (%)	
	Reference sample (without product)	Sample with product
1	4,6	1,3
2	4,8	1,6
3	4,3	1,2
4	4,3	1,2
5	4,5	1,4
Average	4,6	1,4

Report number	24/32307045	Page 6
CURMAX HB Ltd		CURMAX B1

7- Determination of resistance to salt crystallisation, EN 12730

Specimen		Initial weight (g)	Final weight (g)	Mass Variation (%)
Without product	1	2210,66	2253,93	1,96
	2	2214,90	2255,78	1,85
	3	2216,01	2254,32	1,73
			Mean	1,84

Specimen		Initial weight (g)	Final weight (g)	Mass Variation (%)
With product	4	2219,79	2228,33	0,38
	5	2231,87	2248,29	0,74
	6	2225,65	2238,32	0,57
			Mean	0,56

After the cycles no defects appear in the specimens.

Service Quality Assurance

Applus+, guarantees that this work has been made in accordance with our Quality and Sustainability System, fulfilling the contractual conditions and legal norms.

Within our improvement program we would be grateful if you would send us any commentary that you consider opportune, to the person in charge who signs this document, or to the Quality Manager of Applus+, in the following e-mail address: satisfaccion.cliente@applus.com