

TEST REPORT

| SQM_459_2022 |

EXPERIMENTAL DETERMINATION OF THE PERMEABILITY TO WATER (UNI EN 14891 STANDARD) OF A WATERPROOFING PRODUCT CONSISTING OF A MIXTURE OF POLYMERS AND SPECIAL CEMENT DENOMINATED "BASECRETE," PROVIDED BY THE COMPANY "CdC S.R.L.," MILAN (MI)- ITALY.

PLACE AND DATE OF ISSUE	Faenza, 21 st July 2022
COMPANY:	CdC srl
LEGAL HEADQUARTERS:	Via Montenapoleone, 8 – 20122 Milano(MI)
ESTABLISHMENT:	Via Roma, 188 – 26813 Graffignana (LO)
TYPE OF PRODUCT:	<i>Liquid applied waterproofing agents to be used under ceramic tiles bonded with adhesives</i>
APPLIED STANDARD	UNI EN 14891:2012
DATE OF RECEIPT OF SAMPLES:	30 th March 2022
DATE TEST EXECUTION:	March - May 2022
TEST PERFORMED AT:	CertiMaC, Faenza

NOTE: The results contained in this test report refer exclusively to the sample subjected to the tests described below. It is also for the exclusive use of the Principal within the limits of the mandatory regulations and may not be reproduced (in hard copy or digital form) in part, without the written approval of the laboratory.

Execution	Written	Approved
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1 Introduction

This report describes the test of:

- *determination of water permeability,*

performed on a waterproofing product consisting of a mixture of polymers and special cements called "Ba-secrete," the components of which were delivered to the CertiMaC laboratory in Faenza on 03/30/2022 directly by the Client (Refs. 2-a, 2-b).

The test was carried out in accordance with the standards given in Refs. 2-c, Ref. 2-d, Ref. 2-e.

2 References

- a. Estimate: prot. 22164/lab dated 04th April 2022.
- b. Order confirmation: e-mail dated 05th May 2022.
- c. Standard UNI EN 14891:2012 – Prodotti impermeabilizzanti applicati liquidi da utilizzare sotto le piastrelature di ceramica incollate con adesivi. Requisiti, metodi di prova, valutazione della conformità, classificazione e designazione.
- d. Standard EN 480-1:2014. Additives for concrete, mortar and grout for injection - Test methods - Part 1: Concrete and grout reference for testing.
- e. Standard EN 12390-2:2009. Tests on hardened concrete - Part 2: Packaging and curing of specimens for strength tests.

3 Test object

The specimens were packed at the CertiMaC Laboratory in Faenza directly by the Client on 30th March 2022 by applying the mixture components on reference concrete substrates according to the following product specifications:

- Laying of 2 coats of mixture called "BASECRETE" consisting of about 600 g of liquid part (polymers) and 2 kg of powder (cement and aggregates, 0.6 mm quartz) for a total thickness of 3 mm (1.5 mm for each coat). Mixing is done by drill for 2-4 minutes, then allow to rest for 2-3 minutes, then further mixing for 1 minute and rest for a few minutes.
- Laying of 1 coat of mixture consisting of about 550 g of liquid part (polymers) and 2 kg of powder (cement and 0.25 mm ceramic quartz) called "SKIN" for a total thickness of 0.5 to 1 mm. Mixing is done with drill for 2-4 minutes, then let it rest for 2-3 minutes, then further mixing for 1 minute and rest for a few minutes.

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- After 2-3 days, roller application of 2 coats of two-component water-based protective called "SKIN-evo". The second coat is applied when the first coat has hardened.

The whole component was then subjected to the curing treatment, which involves keeping the material in the air for 28 days under controlled conditions of temperature and humidity.

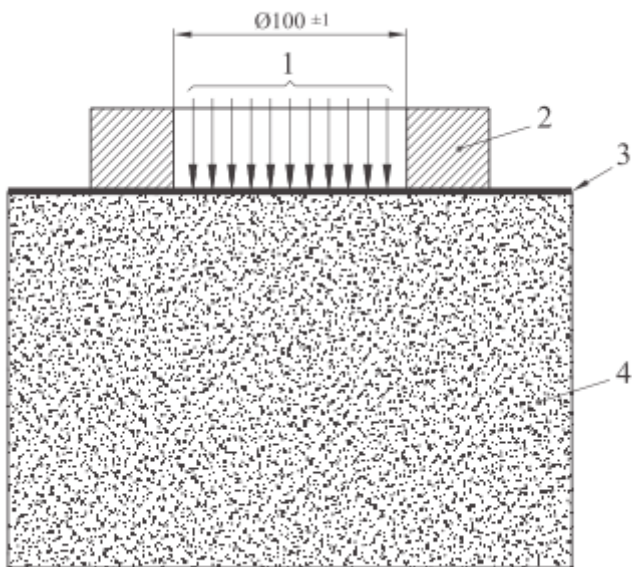
At the end of the curing period, the prepared samples were subjected to testing.

Three samples were tested whose surface area when subjected to water absorption was 78.5 cm², corresponding to a circular surface area of 100 mm diameter, as required by the standard.

4 Test performance and description of results

4.1 Introduction

The test was performed in full compliance with Ref. 2-c, which sets out – in in Appendix A under a.7- the method for determining the water permeability of waterproofing products applied on concrete substrate according to the following scheme:



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| 1 – pressione dell'acqua |
| 2 – anello di tenuta |
| 3 – prodotto impermeabilizzante sottoposto a prova |
| 4 – supporto in calcestruzzo di riferimento |

Permeability was measured by applying a hydrostatic pressure of 150 kPa to a circular section with a diameter of 100 mm for a duration of 7 days.

The test, as required by the standard in Ref. 2-c, was performed on No. 3 specimens.

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4.2 Sample preparation and conditioning

4.2.1 Preparation and curing of the concrete substrate

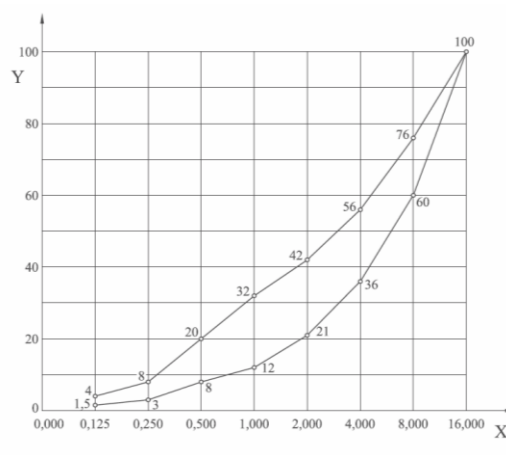
The test specimens consist of a pre-packaged permeable concrete subgrade of minimum size 150x150x100 mm prepared in such molds as to ensure a flat surface.

The standards in Refs. 2-c, 2-d and 2-e give specifications for packing the subgrade:

- CEM 32.5 R o 42.5 R type I, II, III e IV according to EN 197-1:2011 – 250 kg/m³;
- Aggregate with grain size from 0 to 16 mm according to EN 12620+A1:2008 - 1750 kg/m³;
- Mixing water according to EN 1008 – 250 kg/m³;

The above formulation shows a 7:1 sand/cement ratio and a 1:1 water/cement ratio to ensure concrete permeability. In addition, a WRA superplasticizer was included to limit the exudation effect of the cement mix.

In addition, the aggregate used complies with the particle size distribution given in the standard (Appendix A - Figure A.5 reproduced here):



X nominal aperture size (mm)
Y aggregate passing, in mass percentage

Figure 1. Particle size distribution of the aggregate.

The samples thus constituted were packed according to the standard in Ref. 2-d and cured in the laboratory at an ambient temperature of 23±2 °C and a relative humidity of 50% for the required 28 days.

It was then verified that the specimens, prepared with standard dough, guaranteed water absorption under pressure (150 kPa) at 7 days within the limits prescribed by the standard, i.e., a mass increase in the range of 400±100 g at the end of the test.

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4.2.2 Preparation of samples for water permeability measurement

The operations in preparation for the application of the waterproofing product started on 29th March 2022. One of the specimen faces was cleaned and sanded in order to remove efflorescence or traces of release agent, while all other faces, including the base, were waterproofed 24 hours before the test with appropriate silicone material, taking care to apply it perfectly both at the edges and at the edge of the clean face on which the product was then applied until three specimens of the type in Figure 2 were obtained.



Figure 2. Test sample.

The three samples were then kept in a laboratory environment under controlled conditions of temperature and relative humidity of 21 ± 2 °C and 60 ± 10 %, respectively, for 28 days. Then, the samples were weighed (Table 1):

Sample	Initial mass sample m_i (g)
1	8.045,5
2	7.974,3
3	8.028,2

Table 1. Initial value of mass m_i .

Then the actual testing phase began.

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4.3 Test procedure

The test equipment was set up in accordance with the requirements of the standard in 2-c (see Section 4.1 above).

The device available in the laboratory makes it possible, as required, to ensure that the induced pressure acts vertically on a circular surface of size 100 ± 1 mm of the specimen and to identify, at the end of the test, any signs of obvious water permeation (Figure 3).



Figure 3. Experimental apparatus for measuring water permeability under pressure.

The founding principle of the above equipment is to apply hydrostatic pressure to an incompressible fluid by means of the binomial applied mass-mechanical plunger device. The system is designed and sized to ensure a pressure of 150 kPa (1.5 bar) in the test chamber for the entire duration of the test.

After the seven-day pressure test had elapsed, having verified no penetration by water through the underside of the test specimen and no evidence of water penetration through the surfaces not exposed to test, the pressure was removed and the water placed inside the test fixture, the system was dried appropriately and the weighing of the specimens was repeated (Table 2):

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Sample	Final mass sample m_f (g)	Mass increase (g)	Average mass increase (g)
1	8.049,1	3,6	3,0 ± 0,8
2	7.976,4	2,1	
3	8.031,4	3,2	

Table 2. Final values of mass m_f and Mass Increment

5 Conclusions

The standard of Ref. 2-c sets as acceptance limit:

- maximum allowable mass increment: $m_f - m_i \leq 20$ g.

From the experimentation done, it is declared that the tested product, a mixture of polymers and special cements named "Basecrete," having a maximum mass increment of 4 g respects the above acceptance limit.

At the end of the test, the total absence of water infiltration was also noted.

6 Distribution list

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CertiMaC	Archive	1 copy
Company	CdC srl	1 copy

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