

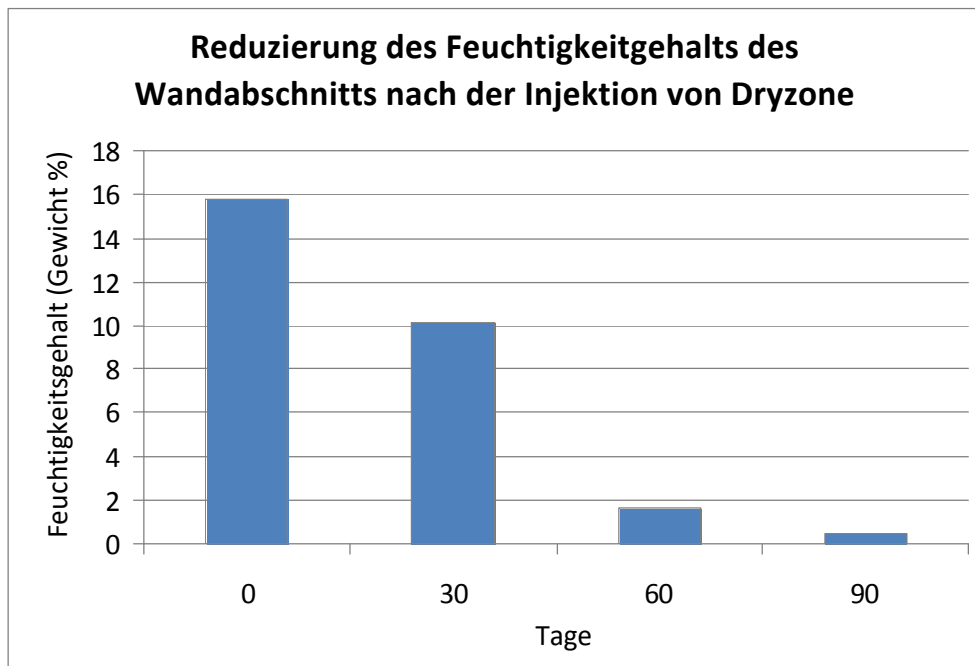
Dryzone Warsaw Testbericht Zusammenfassung

Dieser Bericht gibt einen kurzen Überblick über den ITB Testbericht Nr. LM02-0976 / 11 / R12NM, der die Wirksamkeit von Dryzone untersuchte. Die Prüfung wurde gemäß ZURT-15 / IV.21 / 2008 durchgeführt, einer polnischen Norm zur Bewertung von Horizontalsperren.

Der Test wurde an einem 10" dicken Backsteinwandabschnitt durchgeführt, der mit Kalkmörtel (1 : 1 : 6 Portland-Zement- / Kalk- / Sand-Mischung) gebaut wurde. Der Abschnitt wurde in 30 cm Leitungswasser gestellt und belassen bis dieser einen stabilen Feuchtigkeitsgehalt von 15% hatte.

Die Behandlung der Feuchtigkeit begann mit dem Bohren von Löchern mit 12 mm Durchmesser in 12 cm Intervallen entlang der Mörtelfuge, in einer Höhe von 25 cm über der Wasserlinie. Die Löcher wurden danach mit Dryzone gefüllt und belassen, sodass die Creme in den Wandabschnitt einziehen kann. Während der folgenden zwei Monate wurden Messungen an den Injektionsstellen durchgeführt.

Die Ergebnisse zeigen die Wirksamkeit von Dryzone, durch den schnell abnehmenden Feuchtigkeitswert der Wand über einen gewissen Zeitraum. Innerhalb von 90 Tagen reduzierte sich der Feuchtigkeitswert von anfänglichen 15% auf 0,5%. Die folgende Grafik zeigt den Fortschritt der Reduktion des Feuchtigkeitswerts über den Zeitraum von 3 Monaten.



Dryzone enthält ein hohes Maß an Wirkstoff und ist die strengstest geprüfte cremeförmige Horizontalsperre zur Behandlung von aufsteigender Feuchtigkeit. Die lösemittelfreie, leistungsstarke Rezeptur hat sich in einer Vielzahl von Bedingungen bewährt, unter Anderem bei 95% Sättigung, niedriger Porosität, Salzwasser und Kalkmörtel. Testhäuser sind BBA, WTA, OFI, WTCB, ITB und die University of Portsmouth. Weitere Informationen über diese Tests sind von Safeguard Europe erhältlich.

Translation



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**Tests on Stormdry® Suchy Mur Icopal and Dryzone® Suchy Mur Icopal products for
Technical Recommendation purposes**

Phase II – Dryzone® Suchy Mur Icopal

Work No.: 0976/11/R12NM (LM00-0976/11/R12NM)

Warsaw, February 2012

Translation

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Construction Materials Centre

Work title: Tests on Stormdry® Suchy Mur Icopal and Dryzone® Suchy Mur Icopal products for Technical Recommendation purposes. Phase II – Dryzone® Suchy Mur Icopal

Register No.: 0976/11/R12NM (LM00-0976/11/R12NM)

Customer: ICOPAL S.A.
ul. Laska 169/197
98-220 Zdunska Wola

Contractors:

Team Leader: Dr Barbara Francke, Dr Eng.

Scientific leaders:

Verification:

Work commenced: October 2011

Completed: February 2012

Produced in 3 copies

Annexes: Study report no. LM02-0976/11/R12NM

Copy no.

Tests on Stormdry® Suchy Mur Icopal and Dryzone® Suchy Mur Icopal products for Technical Recommendation purposes

Phase II – Dryzone® Suchy Mur Icopal

0976/11/R12NM

1. Introduction

1.1. Formal basis for work

The formal basis for the work was contract no. 0976/11/R12NM, concluded between ICOPAL S.A. of ul. Laska 169/197, Zdunska Wola, postcode 98-220, and the Institute of Construction Technology in Warsaw.

1.2. Subject, objective and scope of work

The subject of the work in phase II was the product Dryzone® Suchy Mur Icopal. The objective of the work was to test and evaluate selected properties of the above products for technical approval needs.

1.3. Scope of phase II of the work

The scope of the work covered:

- laboratory tests on the product as detailed in point 3,
- drafting of a test report.

2. Samples for testing

The samples for testing were produced from the product Dryzone® Suchy Mur Icopal and in line with the method supplied by the Customer. The product Dryzone® Suchy Mur Icopal was supplied by the Customer on 25.08.11 and accepted for testing under protocol LM02-0976/11/R12NM.

In the case in point, the sample for testing was an experimental wall 25 cm wide, which was built of class 150 full ceramic brick with cement-lime mortar (weight ratio of components: Portland cement : hydrated lime : sand 1:1:6). The wall was placed in a tin bath filled with tap water to a depth of 30 cm. The wall was impregnated with water to a moisture content of ca. 15.8%. Then steps were taken to saturate the wall with the product. This took place as follows:

- 12 mm diameter horizontal holes were drilled in the wall at 12 cm intervals. The holes were drilled in a single row, ca. 25 cm above the surface of the water, with a hole depth of ca. 23.5 cm,
- the holes were filled with the product

3. Scope of tests and methodology for phase II

The phase II laboratory tests involved the following determinations:

- determining the external appearance of the product,
- apparent (volumetric) density,
- pH,
- surface drying time,
- effectiveness of membrane (injection efficacy and spread of product in the wall).

The tests were performed using the test methodology provided in report LM02-0976/11/R12NM, which is included in the annexes to this report.

4. Test results and technical evaluation of product

The test results for the product Dryzone® Suchy Mur Icopal are given in report LM02-0976/11/R12NM, which is included in the annexes to this report.

The visible effects of the product's action were confirmed three months after performance of the injection.

Performance team:

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| ITB | INSTITUTE OF CONSTRUCTION TECHNOLOGY |
| [accreditations] | JOINT RESEARCH LABORATORIES accredited by the Polish Accreditation Centre accreditation certificate no. AB 023 |

LM**TEST REPORT No. LM02-0976/11/R12NM****Page 1/2**

This test report contains the results of tests covered by the scope of accreditation and the results of non-accredited tests. Results outside the scope of accreditation have been marked "*beyond accreditation*".

Construction Materials Laboratory**Address: ul. Filtrowa 1, Warsaw, tel. (22) 57 96 179****CUSTOMER: ICOPAL S.A., ul. Laska 169/197, 98-220 Zdunska Wola****Subject: DRYZONE SUCHY MUR ICOPAL****Accepted for testing 25.08.2011 under protocol no. LM02-0976/11/R12NM****In line with management procedure no. 18****tested during the period 25.09.2011 to 30.01.2012****TEST METHOD/PROCEDURE:** given in table below**TEST RESULTS:**

| Item | Tested characteristics | Test result | Test methods |
|------|--|--|---|
| 1 | Appearance | White cream-like liquid, with no visible mechanical impurities | As described in 1 (beyond accreditation) |
| 2 | Bulk density of liquid ingredient, g/cm ³ : average | 0.92; 0.93; 0.94 | PN-B-30175:1974, item 5.4.9 |
| | | 0.93 U*=0.02 | |
| 3 | PH average | 9.34; 9.46; 9.38; 9.32; 9.36 | PN EN 12850:2011 ** (beyond accreditation) |
| | | 9.37 U* = 0.11 | |
| 4 | Surface drying time, min average | 60; 60; 60 | PB LH-039/2/06-2008 |
| | | 60 | |
| 5 | Spreading of the product in brick wall in the cement-lime mortar at the height of 20 cm above the water level (upper row of holes), directly after injection | Saturation confirmed by product outflow from the holes | ZURT-15/IV.21/2008, i.e. according to description in point 2 (beyond accreditation) |

| | | | |
|---|---|--|--|
| 6 | <p>Efficiency of membrane: mass moisture in the line of injection holes in % (line of drilled holes 25 cm above water level):</p> <p>A/ initial moisture measurements:</p> <p>B/ 30 days after injection:</p> <p>C/ 60 days after injection:</p> <p>D/ 90 days after injection:</p> | <p>14.2; 18.4; 15.7; 17.0; 15.4; 18.0; 13.7; 14.3. Average: 15.8</p> <p>8.7; 11.2; 11.9; 11.7; 9.1; 10.4; 10.4; 7.2. Average: 10.1</p> <p>0.2; 0.9; 1.5; 1.4; 0.6; 3.4; 3.9; 0.9. Average: 1.6</p> <p>0.1; 0.5; 0.9; 0.4; 0.3; 0.9; 0.7; 0.5. Average: 0.5</p> | <p>ZURT-15/IV.21/2008, i.e. according to description in point 3 (beyond accreditation)</p> |
| <p>OTHER INFORMATION ON TESTING:</p> <p>*) extended uncertainty at 95% confidence level</p> <p>**) The ITB Joint Research Laboratories approached PCA for replacement of the old version of the standard PN EN 12850:2009 in the scope of the accreditation by the next edition from 2011. The 2009 edition is in the LM laboratory accreditation scope</p> <ol style="list-style-type: none"> External appearance. Following mixing of the product, the colour and consistency were determined, plus any occurrence of mechanical impurities. An assessment of the spread of the product in the wall (in line with the description in point 3) was carried out visually, during performance of the injection. The test of the effectiveness of the horizontal membrane was carried out on an experimental wall. <p>The experimental wall, 25 cm wide, was built of class 150 full ceramic brick with cement-lime mortar (weight ratio of components: Portland cement : hydrated lime : sand 1:1:6). The wall was placed in a tin bath filled with tap water to a depth of 30 cm. The wall was impregnated with water to a moisture content of ca. 15.8%. Then steps were taken to saturate the wall with the product. This took place as follows:</p> <ul style="list-style-type: none"> 12 mm diameter horizontal holes were drilled in the wall at 12 cm intervals. The holes were drilled in a single row, ca. 25 cm above the surface of the water, with a hole depth of ca. 23.5 cm, the holes were filled with the product | | | |
| <p>Responsible for tests: Dr Barbara Francke, Dr Eng. Lecturer [signature]</p> | | <p>Authorisation issued by: Jolanta Sowinska, M. Eng. [signature]</p> | |
| <p>Warsaw, 6.02.2012</p> | | | |
| <p>The Research Laboratory declares that the test results relate solely to the product/item tested. The report may not be duplicated in any partial way without written consent from the Research Laboratory. A test report is not a document that permits the marketing of a product/item or its general use in the construction industry.</p> | | | |
| <p>LM Laboratory Director [signature] Jadwiga Miklaszewska, M.Eng.</p> | | | |