BUILDING COMMON GROUND

MAX FRANK®

Test Report

Zemseal®

sub-structure waterproofing system

Lateral flow resistance acc. with DIN EN 12390-8

51-17-0196-E | 16.05.2022

tested by: TUM / MPA-BAU, Munich

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TEST REPORT

No.: 51-17-0196-E

Bitumen and Sealings Materials

Date
16.05.2022

Our Ref.
AF/Fi

Subject: Tests on the pre-applied (to fresh concrete) waterproofing membrane for substructures “Zemseal“
Here: Lateral flow resistance in accordance with DIN EN 12390-8

Ref: Order dated 07.11.2017
From Mr MSc.-C.Eng. Nils Grüske-Weißenbach

Pages: 6

1 General

On 07.11.2017 the MPA BAU at TU Munich was asked to perform lateral flow resistance testing around damage to the pre-applied (to fresh concrete) waterproofing membrane for substructures called “Zemseal“, in accordance with DIN EN 12390-8 Testing hardened concrete – Depth of penetration of water under pressure.

Prepared specimens were delivered to the MPA BAU in Munich by the manufacturer on 07.11.2017. According to the manufacturer, the following concrete mix had been used to produce the concrete specimens:
Concrete with high water penetration resistance produced according to section 5, PG-FBB under the DAfStb guidelines for Watertight concrete structures (WU Guideline), section 6, including the following mix design specifications and conditions:
-Aggregates mainly quartz based
-Maximum particle size 16 mm
-CEM I 32.5 R
-Compressive strength class C 30/37
-w/c ratio 0.55
-7-day controlled moist curing

2 Test Results

The concrete specimens for the lateral flow resistance tests had a cube size of 15 x 15 x 15 cm and the Zemseal pre-applied waterproofing membrane was applied on one face. The diameter of the damage was 25 mm and this was made centrally on the face.

A water bell was mounted tightly on the prepared specimens. The water was coloured with the indicator Eosin rosa to track the lateral flow. A pressure of 500kPa (5bar) was applied to the specimen through the bell for a period of 7 days The bell was then removed and the Zemseal membrane was removed from the specimen and the spread of the coloured water on the concrete specimen was measured.

The requirement for this test is that the water must not have spread a distance of more than 30 mm outside the damaged area and this overall circular area must have less than 50% colouring. Four out of five specimens must pass this test.

The “Zemseal“ pre-applied waterproofing membrane is factory manufactured in a range of different thicknesses and weights per unit area. These are:

Zemseal 05 with 0.8 mm thickness and weight of 500 g/m^2
Zemseal 08 with 1.0 mm thickness and weight of 650 g/m^2
Zemseal 12 with 1.2 mm thickness and weight of 800 g/m^2

The results of the tests are listed in the table below.

	Test 1	Test 2	Test 3	Test 4	Test 5	
Start	23.11.2017	06.12.2017	14.12.2017	21.12.2017	28.12.2017	
End	30.11.2017	13.12.2017	21.12.2017	28.12.2017	04.01.2018	
Sample	Maximum distance from the damage in 5mm circles					**Result**
Zemseal 500g/m²	5	10	10	10	10	**5/5 passes**
< 50 % of area up to 30mm	Yes	Yes	Yes	Yes	Yes	
Result for each specimen	**Passed**	**Passed**	**Passed**	**Passed**	**Passed**	
Zemseal 650g/m²	10	5	10	20	10	**5/5 passes**
< 50 % of area up to 30mm	Yes	Yes	Yes	Yes	Yes	
Result for each specimen	**Passed**	**Passed**	**Passed**	**Passed**	**Passed**	
Zemseal 800g/m²	10	15	20	25	10	**5/5 passes**
< 50 % of area up to 30mm	Yes	Yes	Yes	Yes	Yes	
Result for each specimen	**Passed**	**Passed**	**Passed**	**Passed**	**Passed**	

A photographic record of the specimens and testing is given in figures 1 to 3 on pages 4 to 6.

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MATERIALPRÜFUNGSAMT FÜR DAS BAUWESEN
ABTEILUNG BAUSTOFFE

Leiter der RAP Stra Prüfstelle

stellv. Leiter der RAP Stra Prüfstelle

Ltd.Akad.Dir. Dr.-Ing. Th. Wörner
Leiter der Arbeitsgruppe
Bitumenhaltige Baustoffe und Gesteine

Dr.-Ing. Bernd Wallner
Leiter der Fachgruppe
Bitumen und Abdichtungen

Figure 1: Photos of ‘‘Zemseal 500“ test results

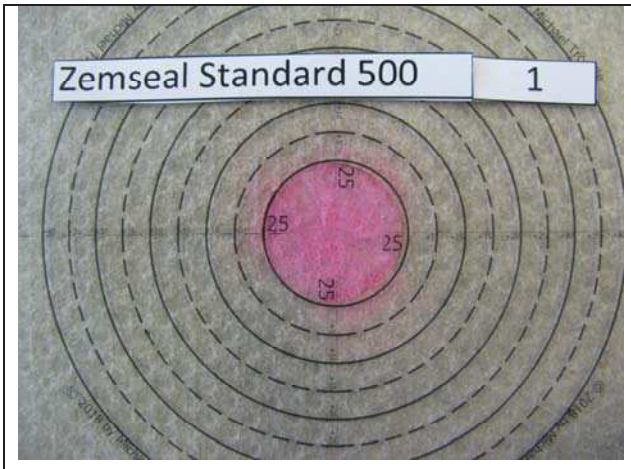
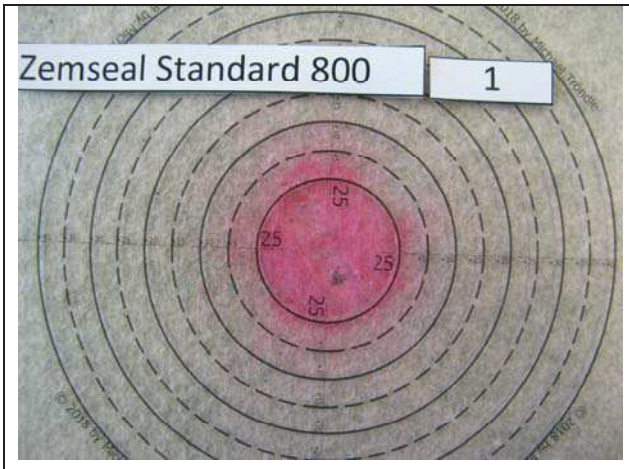
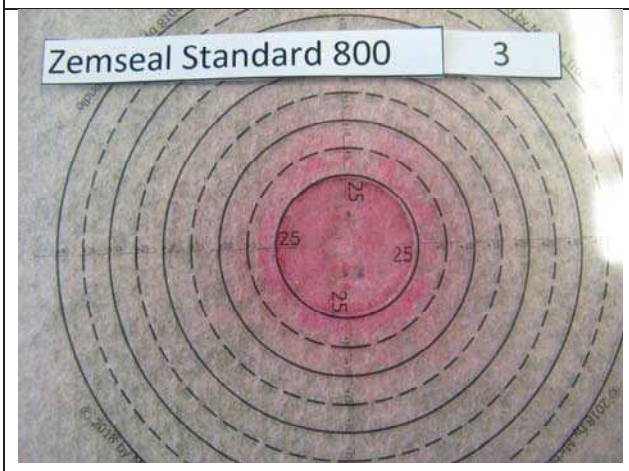
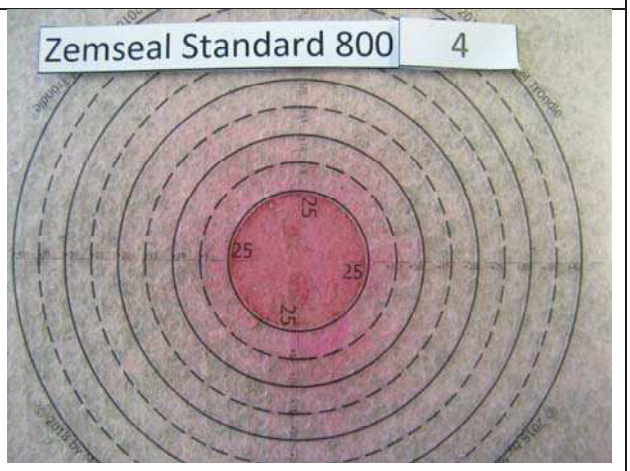
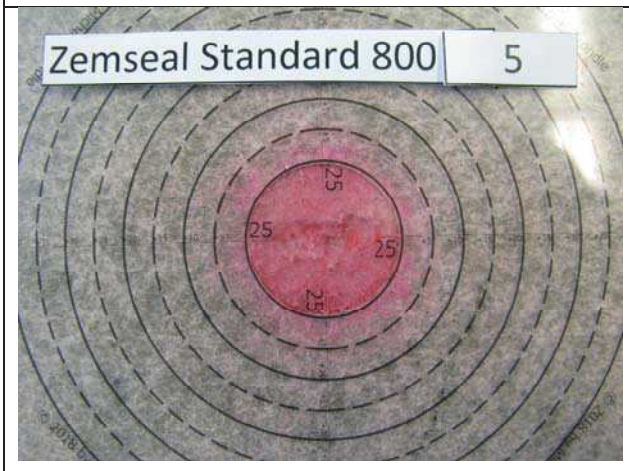
	
Zemseal 500 I	Zemseal 500 II
	
Zemseal 500 III	Zemseal 500 IV
	
Zemseal 500 V	

Figure 2: Photos of ‘‘Zemseal Standard 650“ test results

	
Zemseal 650 I	Zemseal 650 II
	
Zemseal 650 III	Zemseal 650 IV
	
Zemseal 650 V	

Figure 3: Photos of ‘‘Zemseal 800“ test results

	
Zemseal 800 I	Zemseal 800 II
	
Zemseal 800 III	Zemseal 800 IV
	
Zemseal 800 V	