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Test Report

No. 11 - 007

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Commission: „Soudabond Easy“

Investigations to the bond strength (dry) in support of ETAG - Guideline 004
on gypsum plaster board

Customer: Soudal N.V.

Everdongelaan 18-20

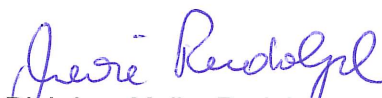
B-2300 Turnhout

Liability: Institute for Facades and Fixing Technology

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The Test Report contains 5 pages and 1 annex.

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Contents

	page
0 References	3
1 Introduction	4
2 Test conception	4
2.1 Test specimens	4
2.2 Test equipment	4
2.3 Testing	5
3 Summary	5

Annexes

Annex Bond strength (dry) on gypsum plaster board

0 References

- [1] ETAG - Guideline 004
Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with rendering
German version, March 2001

- [2] DIBt - Methods of verification of PU-Foam as adhesive for ETICS on polystyrene

- [3] Test Report 09 - 007 from 04/02/2009
"Soudal Dämmstoffkleber" to the application in ETICS with polystyrene
Investigations to the bond strength according to ETAG - Guideline 004 and under modification of the application conditions
IFBT GmbH, Hans-Weigel-Str. 2b, D - 04319 Leipzig

1 Introduction

The IFBT GmbH (Institute of Facades and Fixing Technology) was commissioned by the company Soudal N.V. to carry out investigations to the bond strength (dry) of the PU-Foam „Soudabond Easy“ on gypsum plaster board in support of ETAG - Guideline 004 [1].

The materials (gypsum plaster board $d = 12.5$ mm, Soudabond Easy) were delivered by the customer.

2 Test conception

2.1 Test specimens

The test specimens were produced by a member of staff of IFBT GmbH. The PU-Foam was always applied fully spread (meandering) on insulation product, which were stuck then on the gypsum plaster board. To reach the respective thickness of the hardened foam of 8 mm, distance holders were laid between insulating panels and gypsum plaster board. The PU-Foam was stored in a normal climate (23 ± 2 °C/ (50 ± 5) RH).

The specimens were prepared for the 'dry' adhesion tests (A) in 4 stages:

1. At least 1 day of storage at (23 ± 2) °C/ (50 ± 5)% relative humidity
2. Preparation of the specimens - Distance of the insulation material to PU-foam
3. Preparation of the tests
 - Gluing on the deflection-resistant metal stamps (size 50 mm x 50 mm) with adhesive.
 - Cutting into the test surfaces till the substrate or insulation material.
4. Test
 - Testing was carried out after the adhesive had dried.

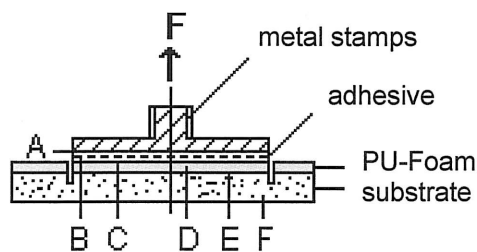
2.2 Test equipment

The bond strength was determined using the test apparatus F6D EASY MLC manufactured by Fa. Maschinenbau Josef Freundl.

The aims of the test are:

1. To subject the system to even and extensive normal strain,
2. To determine the failures (tear-off) load
3. To spot the failing layer or failing composite layer
4. To determine the axial stiffness (load/displacement curve) in the area of the characteristic load and until failures (tear-off)

Possible types of failure



A - C Testing failure

D - F Failure to be evaluated

D Failure in PU-Foam

E Failure in the joint between PU-Foam/
substrate

F Failure on substrate

Diagram 1: Bond strength on the substrate

2.3 Testing

The tests to determine the bond strength of the PU-Foam "Soudabond Easy" on gypsum plaster board in support of ETAG - Guideline 004 [1] was carried out only in dry condition. 5 attempts were carried out. The single results as well as the picture documentation are included in the annex.

3 Summary

The test results (average value and minimum value) of the carried out tests are summarised in the following table for the PU-Foam „Soudabond Easy“ on the substrate "gypsum plaster board".

Point	Test	average value	minimum value	annex
Bond strength (dry) on substrates [N/mm ²], d = 8 mm				
1	gypsum plaster board, d = 12.5 mm	0.19	0.175	annex

Table 1: Test results

The information of the types of failure can be found in the annex.

Annex

Test Report 11 - 007

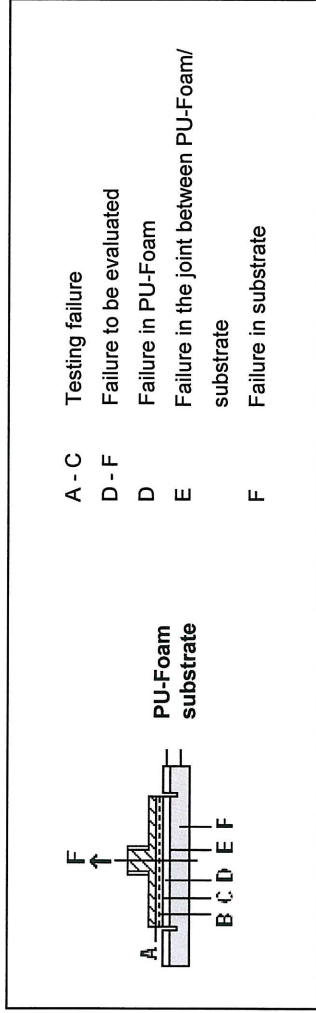
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„Soudabond Easy“

Bond strength (dry) on gypsum plaster board

Bond strength (dry) on substrate in support on ETAG - Guideline 004 point 5.1.4.1.2

Substrate: gypsum plaster board d = 12.5 mm
Adhesive: Soudabond Easy, thickness 8 mm



No.	thickness [mm]	dimensions [mm]	bond strength σ_{BS} [N/mm ²]	average value $\sigma_{BS, average}$ minimum value $\sigma_{BS, min}$ [N/mm ²]	A-C	failure in %			
Normal climate (23 °C/ 50 % RH)									
1	8	50 x 50	0.175	$\sigma_{BS, average} = 0.19$ $\sigma_{BS, min} = 0.175$		100			
2			0.181						100
3			0.201						
4			0.176						
5			0.212						

