

Test report no. 152723

English Version

1. issue dated 16.11.2015

Sponsor: 3A Composites GmbH
Kiefernweg 10
49090 Osnabrück

Order from: 31.08.2015 – Fatmir Beari

Order: Single-flame source test according to DIN 4102-1: 1998-05,
Baustoffklasse B2, of „Kapa Fix-1“ sandwich-elements with PUR
hard foam core and aluminum reinforced cardboard surface
layers on both sides and self-adhesive on one side

Notes: In Germany this test report can be used only for a building
material, not for a building product.

For sale on the German market, other special papers according
to the German „Landesbauordnung“ are needed in addition.

This test report can be used for these special papers.

This test report consists of 5 pages.



In case of any dispute the German version is decisive. The test report shall be published unabridged.
Any partial publishing requires written allowance by the testing institute. The test results refer only to
the tested material.

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1 Sampling and delivery

Sampling: by sponsor
 Receipt: 09.07.2015 by DHL
 Quantity: 25 specimens: 230 mm x 90 mm x 10 mm
 25 specimens: 230 mm x 90 mm x 3 mm

2 Description of the test specimens

Identification: Kapa Fix-1
 Constituents: PUR hard foam, aluminum foil, cardboard-layers
 Composition: The building product is made of a flat PUR hard foam core covered on front and rear side with different surface layers. The front layer, reinforced by aluminum foil, is self-adhesive and covered by a protective sheet. The back layer contains aluminum foil.
 Colour: front and back side: light-grey-white
 PUR foam core: grey
 Nominal thickness: 10 mm and 3 mm

3 Preparation

Since front and back surface of the building product are likely to be exposed to fire in practice, both sides are tested. For this purpose the protective sheet is removed.

4 Test results

4.1 Thickness, mass per unit area and gross density

The thickness and the mass per unit area of the samples as well as the gross density of the PUR hard foam are listed in table 1.

Table 1: Thickness, mass per unit area and gross density

nominal thickness	10	3	mm
thickness	10,1	2,9	mm
mass per unit area	1,15	0,86	kg/m ²
gross density of the PUR hard foam:	ca. 45	ca. 47	kg/m ³

4.2 Reaction to fire tests

Before testing the samples were kept for at least 14 days in a conditioning chamber in the reference atmosphere according to DIN 50014 - 23/50-2. The reaction to fire tests were carried out in accordance with DIN 4102-1:1998-05, clause 6.2.5. Because of the multilayer construction in accordance with clause 6.2.5.5, also specimens turned at 90° round in vertical axis, i.e. the PUR hard foam core were tested.

Five edge flame impingements according to clause 6.2.5.2 (specimen nos. 1 to 5) and five surface flame impingements according to clause 6.2.5.3 (specimen nos. 6 to 10) were carried out on the front side and on the back side. At the lateral surface of the samples (rotated at 90°) only five edge flame impingements (specimen nos. 1 to 5) of the PUR hard foam were carried out.

Duration of flame impingement: 15 s

Duration of observation: 20 s

Number of tests: 45

Date of test: 05.08.2015

The test results are listed in table 2 to 6.

Table 2: Results of the single-flame source test

front side (with the self-adhesive)

nominal thickness = 10 mm	edge flame impingement					surface flame impingement				
specimen no.	1	2	3	4	5	6	7	8	9	10
time of ignition after flame impingement begin s	0,4	0,4	0,3	0,3	0,4	3,8	3,4	3,3	3,4	3,1
duration of flames s	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	12,1	12,3	12,6	12,2	12,4
maximum vertical flame spread mm	80	70	90	70	90	30	30	30	30	30
smoke production	high					low				
flaming droplets / particles	none									

*) The flames were extinguished after 60 s.

Table 3: Results of the single-flame source test

back side (without self-adhesive)

nominal thickness = 10 mm	edge flame impingement					surface flame impingement				
specimen no.	1	2	3	4	5	6	7	8	9	10
time of ignition after flame impingement begin s	1,0	0,6	0,4	0,8	0,4	4,8	3,6	6,3	7,3	6,0
duration of flames s	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	9,8	8,6	60 ^{*)}
maximum vertical flame spread mm	80	70	70	60	60	60	60	30	30	60
smoke production	high					moderate				
flaming droplets / particles	none									

*) The flames were extinguished after 60 s.

Table 4: Results of the single-flame source test**toured at 90° round in vertical axis (PUR foam)**

nominal thickness = 10 mm	edge flame impingement				
specimen no.	1	2	3	4	5
time of ignition after flame impingement begin s	0,8	0,7	0,8	0,8	0,4
duration of flames s	14,9	15,0	15,0	14,5	14,8
maximum vertical flame spread mm	30	30	30	20	30
smoke production	high				
flaming droplets / particles	none				

Table 5: Results of the single-flame source test**front side (with the self-adhesive)**

nominal thickness = 3 mm	edge flame impingement					surface flame impingement				
specimen no.	1	2	3	4	5	6	7	8	9	10
time of ignition after flame impingement begin s	0,8	0,6	0,8	0,3	0,4	2,5	2,6	3,2	3,4	2,6
duration of flames s	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	13,0	13,1	12,2	11,8	12,7
maximum vertical flame spread mm	60	60	50	60	60	30	30	30	30	30
smoke production	high					low				
flaming droplets / particles	none									

*) The flames were extinguished after 60 s.

Table 6: Results of the single-flame source test**back side (without self-adhesive)**

nominal thickness = 3 mm	edge flame impingement					surface flame impingement				
specimen no.	1	2	3	4	5	6	7	8	9	10
time of ignition after flame impingement begin s	0,9	0,8	0,6	0,8	1,2	4,9	5,5	3,8	5,8	5,9
duration of flames s	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}	60 ^{*)}
maximum vertical flame spread mm	60	60	80	80	80	70	80	80	90	70
smoke production	high					moderate				
flaming droplets / particles	none									

*) The flames were extinguished after 60 s.

Requirement:

Before the end of the 20th second after start of the flame impingement, the top of the flames must not reach the limit (150 mm), for any specimen.

5 Assessment

The test material „Kapa Fix 1“ with the nominal thickness of 3 mm to 10 mm meets the requirements of Baustoffklasse B2 according to DIN 4102-1.

During the tests there were no flaming droplets / particles according to DIN 4102-1 clause 6.2.6.

6 Notes

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The validity of this test report expires on 31.08.2020.

Hannover, 16. 11. 2015

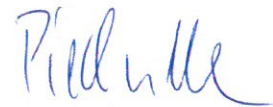
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