

Classification report for roofs/roof coverings exposed to external fire No. 19901H

Owner of the classification report

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Introduction

This classification report defines the classification assigned to the roof/roof covering **«Börner Polymer – Bitumen Membranes»** in accordance with the procedures given in the standard EN 13501-5:2016 : Fire classification of construction products and building elements – Part 5: Classification using data from external fire exposure to roofs tests: Test 4: Method with two stages incorporating burning brands, wind and supplementary radiant heat

This classification report consists of 11 pages

1. DESCRIPTION OF THE ROOF/ROOF COVERING

This description is based on information given by the sponsor.

	Nominal value	Measured value
SUPPORTING DECK		
Material	Plywood	
Density (kg/m ³)	600	
Thickness (mm)	18	
VAPOUR BARRIER		
Material	Bituminous vapour barrier with a composite aluminium reinforcement and a quartz sand finish	
Trade name	Daco-KSD-B	
Manufacturer / Supplier	Georg Börner GmbH & Co KG	
Mineral finishing (material + g/m ²)	Quartz sand 600 g/m ²	
Reinforcement (material + g/m ²)	Composite glass and aluminium 200 g/m ²	
Thickness (mm)	2.5	(1)
Surface weight (g/m ²)	600	(1)
Flame retardants	No	(1)
Fixing method	Self-adhesive	
Reaction to fire according to EN 13501-1	E	
GLUE		
Material	PU Bonding adhesive	
Trade name	PUK 3D	
Applied surface weight (g/m ²) (dry)	Max 300 g/m ²	
Density (kg/m ³) (wet)	1,03	
Solid content (m/m %)	Not communicated	
Application	Strip wise	
INSULATING LAYER		
Material	Bitumen faced mineral wool	
Trade name	MiFa DP-GF-BI	
Manufacturer	Kaiser Dämmstoff GmbH & Co.KG	
Supplier	Georg Börner GmbH & Co KG	
Thickness (mm)		
	<i>Thickness 1</i>	60 (single layer) (1)
	<i>Thickness 2</i>	120+120 (two layers) (1)
Density (kg/m ³)	140-160	(1)
Flame retardants	No	(1)
Fixing method	Glued	
Reaction to fire according to EN 13501-1	A1	

(1) Not verifiable

ROOF COVERING		
UNDER LAYER (OPTIONAL)		
Material	Bituminous SBS underlay with G200 glass reinforcement and a foil finish	
Trade name	Daco-KSU	
Manufacturer / Supplier	Georg Börner GmbH & Co KG	
Reinforcement (material + g/m ²)	Glass, 200 g/m ²	
Thickness (mm)	3.0	(1)
Surface weight (g/m ²)	4000	(1)
Flame retardants	No	(1)
Fixing method	Cold self-adhesive	
GLUE (OPTIONAL)		
Material	PU Bonding adhesive	
Trade name	PUK 3D	
Applied surface weight (g/m ²) (dry)	Max 300 g/m ²	
Density (kg/m ³) (wet)	1,03	
Solid content (m/m %)	Not communicated	
Application	Strip wise	
TOP LAYER		
A) POLY Elast PV180 S4		
Material	Elastomeric SBS bituminous membrane with a polyester fleece reinforcement	
Manufacturer / Supplier	Georg Börner GmbH & Co KG	
Colour	Grey	
Mineral finish	1600 g/m ²	
Reinforcement (material + g/m ²)	Polyester fleece 180 g/m ²	
Thickness (mm)	4.2	(1)
Surface weight (g/m ²)	1600	(1)
Flame retardants	Yes	(1)
Fixing method	Fully torched	
Reaction to fire according to EN 13501-1	E	

(1) Not verifiable

The other SBS top layers and under layers who have not been tested but are included in the field of application are mentioned in annex A and B

Summary of tested systems and parameters:

	E-1	E-2	E-3
Top layer	Poly Elast PV180 S4	Poly Elast PV180 S4	POLY-Elast 3K
Fixation	Torched	Torched	Mechanical
Under layer	DACO KSU	DACO KSU	N/A
Fixation	Cold self-adhesive	Cold self-adhesive	N/A
Insulation	60 mm MW	240 mm MW	60 mm MW
Fixation	PU adhesive	PU adhesive	PU adhesive
Vapour barrier	DACO-KSD-B	DACO-KSD-B	DACO-KSD-B
Fixation	Self-adhesive	Self-adhesive	Self-adhesive
Substrate	Plywood		

2. TEST REPORTS AND TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION

a) Test reports

Name of the laboratory	Name of the sponsor	Test report ref. no.	Test method
WFRGENT nv Ghent - Belgium	Georg Börner GmbH & Co KG	19901E & F 20177A	CEN/TS 1187:2012: Test 4
WFRGENT nv Ghent - Belgium	Georg Börner GmbH & Co KG	19901G	CEN/TS 16459:2013

b) Test results

Test conditions: 19901E

Test date: 04/09/2019

Room temperature at start of test (°C): 20

Roof pitch: 0°

PRELIMINARY IGNITION TEST WITH BURNING BRANDS (STAGE 1)

Specimen No:	E-1' (*)	E-2'
Duration of flaming after withdrawal of the test flame (min:sec)	00:20	00:10
Maximum flame spread distance (mm)	110	70
Time to fire penetration (min:sec)	Did not penetrate	Did not penetrate
Nature of the penetration	N.a.	N.a.

(*) Preliminary test corresponding with the penetration test in stage 2

PENETRATION TEST WITH BURNING BRANDS, WIND AND SUPPLEMENTARY RADIANT HEAT (STAGE 2)

Specimen No:	E-1(*)	E-2	Average
Time to fire penetration (min:sec)	Did not penetrate	Did not penetrate	Did not penetrate
Nature of the penetration	N.a.	N.a.	N.a.
Additional observations: Marked variability between the specimen: None			

(*) reused in the official test 19901F

Test conditions: 20177A

Test date: 17/02/2020

Room temperature at start of test (°C): 18

Roof pitch: 0°

Build-up: Plywood + DACO-KSD-B + Mineral wool 60 mm + Poly Elast 3K

PRELIMINARY IGNITION TEST WITH BURNING BRANDS (STAGE 1)

Specimen No:	A-4'
Duration of flaming after withdrawal of the test flame (min:sec)	00:00
Maximum flame spread distance (mm)	90
Time to fire penetration (min:sec)	Did not penetrate
Nature of the penetration	N.a.

(') preliminary test corresponding with the penetration test in stage 2

PENETRATION TEST WITH BURNING BRANDS, WIND AND SUPPLEMENTARY RADIANT HEAT (STAGE 2)

Specimen No:	A-4
Time to fire penetration (min:sec)	Did not penetrate
Nature of the penetration	N.a.
Additional observations: Panels did not ignite, carbonization, melting Marked variability between the specimen: None	

Test conditions: 19901F

Test date: 04/09/2019 & 27/09/2019

Room temperature at start of test (°C): 20

Roof pitch: 0°

Substrate: Plywood (18 mm, 600 kg/m³)

Build-up: DACO KSD-B + 60 mm Mineral wool + DACO KSU + Poly Elast PV180 S4

PRELIMINARY TEST (STAGE 1)

Parameter	Criteria				Test ^(a) results	Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)	Spec. 1	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Burn time	< 5 min	< 5 min	< 5 min	< 5 min	00:20	Yes	Yes	Yes	Yes
Flame spread distance	< 0,38 m	< 0,38 m	< 0,38 m	No limit	0,11	Yes	Yes	Yes	Yes
Penetration	None	None	None	None	None	Yes	Yes	Yes	Yes

(a) Not for extended application.

PENETRATION TEST (STAGE 2)

Parameter	Criteria			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Penetration	≥ 60 min	< 60 min ≥ 30 min	< 30 min	< 30 min
Parameter	Test ^(a) results			
	Spec. 1	Spec. 2	Spec. 3	Mean ^a
Penetration	None	None	None	None
Parameter	Compliance			
	Class B _{ROOF} (t4)	Class C _{ROOF} (t4)	Class D _{ROOF} (t4)	Class E _{ROOF} (t4)
Penetration	Yes	Yes	Yes	Yes

(a) If one or two of the specimens have not failed at one hour, a time of 60 min shall be used in calculating the mean time of penetration.

3. CLASSIFICATION AND FIELD OF APPLICATION

a) Reference

This classification has been carried out in accordance with clause 9 test 4 of EN 13501-5:2016 and EN 13707:2004.

b) Classification

The roof / roof covering < **Börner Polymer – Bitumen Membranes** > in relation to its external fire performance is classified:

BROOF (t4)

c) Direct field of application

The classification is valid for the system as described in §1 for the following conditions:

- Range of pitches: $\leq 10^\circ$

d) Extended field of application

- **Range of layer 0 (Top layer)** :POLY Elast 3K, Elmo-Flex 4K, Poly Elast PV180S4, ELMO Star, DACO KSO,... also included are the top layers mentioned in annex A:

Thickness	4,2-5,2 mm
Surface weight	1200-1800 g/m ²
Reinforcement	- 300 g/m ² polyester or less - Additional glass fleece allowed
Fixing method	- Fully adhered by torching - Glued - Mechanical

- **Range of layer 1 Glue (Optional)**: used in single layer systems with top layer ELMO-flex 4K or Poly Elast 3K

Product:	PU Bonding adhesive
Surface weight applied (g/m ²)	Max 300 g/m ²
Mass percentage %	Not communicated
Application method	Strip wise

- **Range of layer 2 (Under layer, optional in double layer system)**: modified bitumen with a polyester composite, glass fleece or glass fibre reinforcement, also included are the under layers mentioned in annex B

Thickness	2,9-5,0 mm
Surface weight	500-4000 g/m ²
Reinforcement	- Glass fibre 200 g/m ² or more - Polyester fleece 250 g/m ² or less - Additional glass fleece allowed
Fixing method	Self-adhesive / Torched / Mechanical

➤ **Range of layer 3: Insulation:** Mineral wool insulation

Products:	Bitumen faced mineral wool
Thickness	60 mm or more
Density	130-160 kg/m ³
Reaction to fire classification	A1
Fixing method	Glued with PU adhesive

➤ **Range of layer 3: Glue**

Product:	PU bonding adhesive
Surface weight applied (g/m ²)	Max 300 g/m ²
Mass percentage %	Not communicated
Application method	Strip wise

➤ **Range of layer 5: vapour barrier**

Range of vapour barriers	Any bituminous vapour barrier according to EN13707:2004
Reaction to fire according to EN13501-1	E or better

1.1 Range of layer 6: Supporting deck

Range of supporting deck:	Plywood (18 mm or more, 600 kg/m ³)
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4. **LIMITATIONS**

At the time the standard EN 13501-5:2016 was published, no decision was made concerning the duration of validity of a classification document.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonized standards and technical specifications.

5. **WARNING**

This classification report does not represent type approval nor certification of the product.

6. CONCERNING DECLARATION OF PERFORMANCE (DoP) ACCORDING TO THE CONSTRUCTION PRODUCT REGULATION (CPR)

Annex ZA of the harmonized standard

- EN 13707: 2004 – “Flexible sheets for waterproofing - Reinforced bitumen sheets for roof waterproofing”

declares that a System 3 Attestation of Conformity (AoC) under the Construction Products Directive (CPD: 89/106/EEC) is required for all external fire performance declarations better than class F_{roof} (t1, t2, t3, t4). Under the Construction Products Regulation (CPR: EU 305/2011) this corresponds with a System 3 of Assessment and Verification of Constancy of Performance (AVCP) as basis for a Declaration of Performance (DoP).

The classification assigned to the product in this report is appropriate to such a Declaration of Performance of the essential characteristics of the construction product by the manufacturer within the context of a System 3 Assessment and Verification of Constancy of Performance. Under the Construction Products Regulation a Declaration of Performance (DoP) is a requirement for affixing the CE marking.

PREPARED BY

APPROVED BY

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Annex A: SBS membranes (top layers)

1) POLY ELAST PV180 S4

Thickness: approx.: 4,2 mm
Reinforcement: Polyester 180 g/m²
Compound: SBS
Application: torch on membrane

2) DACO KSO+

Thickness: approx.: 4,2 mm
Reinforcement: Glass fibre 200g
Compound: SBS
Application: Self- adhesive

3) DACO KSO

Thickness: approx.: 4,2 mm
Reinforcement: Polyester Compound
Compound: SBS
Application: Self- adhesive

4) POLY ELAST RAPID O

Thickness: approx.: 5,0 mm
Reinforcement: Polyester Compound
Compound: SBS
Application: torch on membrane

5) SK BIT 105 PV Wurzelschutz (root resistant)

Thickness: approx.: 5,2 mm
Reinforcement: Polyester
Compound: SBS compound
Application: torch on membrane

6) POLY ELAST 3K

Thickness: approx.: 5,2 mm
Reinforcement: 3 K compound
Compound: SBS
Application: torch on membrane

7) ELMO STAR

Thickness: approx.: 5,2 mm
Reinforcement: 4 K compound
Compound: SBS
Application: torch on membrane

8) POLY – Elast PV 250 S5

Thickness: approx.: 5,2 mm
Reinforcement: polyester
Compound: SBS
Application: torch on membrane

Annex B: SBS membranes (under layers)

1) Inter Stick SK 3 Extra

Thickness: approx.: 3,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Self adhesive

2) DACO KSU+

Thickness: approx.: 3,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Self adhesive

3) DACO KSU

Thickness: approx.: 3,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Self adhesive

4) DACO KSU-SI

Thickness: approx.: 3,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Self adhesive

5) Monoplex SBS PV 180 S4

Thickness: approx.: 4,0 mm
Reinforcement: Polyester 180
Compound: SBS
Application: Torch on membrane

6) POLY ELAST GG 200 S4

Thickness: approx.: 4,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Torch on membrane

7) MONOPLEX SBS GG 200 S4

Thickness: approx.: 4,0 mm
Reinforcement: Glass fibre 200 g
Compound: SBS
Application: Torch on membrane

8) Poly Elast PV 200 S5

Thickness: approx.: 5,0 mm
Reinforcement: Polyester 250g
Compound: SBS
Application: Torch on membrane

9) DACO-KSU-FO

Thickness: approx.: 3,0 mm
Reinforcement: Glass fibre 200g
Compound: SBS
Application: Self-adhesive