

Laboratory for Fire Safety

Summary of fire resistance:

Bostik FP 404 Fire Retardant PU (Gun)Foam connecting stone to stone and stone to wood

On behalf of Bostik Benelux BV, eight tests were performed for determination of the fire resistance of several linear joint seals with Bostik FP 404 Fire Retardant PU (Gun)Foam (further called FP 404 Fire Retardant PU (Gun)Foam or Bostik FP 404) in walls and floors of aerated concrete and connection to wood. The tests were performed in accordance with the European test standard EN 1366-4:2006+A1:2010 and EN 1366-4:2021 using the standard heating curve.

FP 404 Fire Retardant PU (Gun)Foam is available in a canister (Bostik FP 404 Hand Held) and as a canister for a PU gun (Bostik FP 404 Gun Grade). The composition of Bostik FP 404 Hand Held and Bostik FP 404 Gun Grade is identical and further defined as FP 404 Fire Retardant PU (Gun)Foam.



This summary provides an outline of the product performance and the conclusions of the tests. For a complete description of the examined linear joint seals, please refer to the reports mentioned in the footnote.

Based on the tests performed in accordance with EN 1366-4:2006+A1:2010, EN 1366-4:2021 and the extended applications in accordance with EN 15882-4:2012, the system was classified in accordance with EN 13501-2:2007+A1:2009 and EN 13501-2:2016. Taking into account the possible classification times mentioned in the standard, a linear joint seal made out of FP 404 Fire Retardant PU (Gun)Foam, is classified according to the following combinations of performance parameters and classes.

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Fire resistance classification (vertical linear joint seals in a stone wall)		
Bostik FP 404 vertically orientated connecting stone to stone		
Wall thickness ≥ 70 mm EI 30 – V – X – F – W 8 to 10 EI 20 – V – X – F – W 10 to 20	Wall thickness ≥ 100 mm EI 90 – V – X – F – W 8 to 10 EI 45 – V – X – F – W 10 to 30	Wall thickness ≥ 115 mm EI 120 – V – X – F – W 8 EI 60 – V – X – F – W 8 to 20 EI 45 – V – X – F – W 20 to 30

E = Criterion integrity, I = Criterion insulation, V = Vertical application in a vertical wall, X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

The following conditions apply:

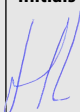
- the classifications are valid for linear joint seals in a wall with an orientation as mentioned (vertical). The classifications are valid in both directions;
- the linear joint seals may connect to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned in the classifications (70, 100 or 115 mm);
- the surfaces of the material on which FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the allowed movement capability in practice is maximized to 7,5 %;
- the linear joint seal must be fully filled with FP 404 Fire Retardant PU (Gun)Foam.

Fire resistance classification (vertical linear joint seals in a stone wall)		
Bostik FP 404 vertically orientated connecting stone to stone		Bostik FP 404 vertically orientated connecting stone to wood
Wall thickness ≥ 150 mm EI 45 – V – X – F – W 8 to 40	Wall thickness ≥ 200 mm EI 120 – V – X – F – W 8 to 30 EI 60 – V – X – F – W 30 to 40	Wall thickness ≥ 100 mm EI 120 – V – X – F – W 8 to 20

E = Criterion integrity, I = Criterion insulation, V = Vertical application in a vertical wall, X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

The following conditions apply:

- the classifications are valid for linear joint seals in a wall with an orientation as mentioned (vertical). The classifications are valid in both directions;
- the linear joint seals may connect to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned in the classifications (100, 150 or 200 mm);

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- if applicable, on the other side the linear joint seal connects to any type of wooden construction with a density of $500\pm 50 \text{ kg/m}^3$ or more where the wooden construction is placed over the full thickness of the wall or minimal thickness as mentioned in the classifications (100 mm);
- the surfaces of the material on which FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the allowed movement capability in practice is maximized to 7,5 %;
- the linear joint seal must be fully filled with FP 404 Fire Retardant PU (Gun)Foam.

Fire resistance classification (horizontal linear joint seals in a stone wall)
Bostik FP 404 connecting stone to wood
Wall thickness $\geq 100 \text{ mm}$ EI 90 – T – X – F – W 8 to 20

E = Criterion integrity, I = Criterion insulation, T = Horizontal application in a vertical wall, X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

The following conditions apply:

- the classifications are valid for linear joint seals in a wall with an orientation as mentioned (horizontal). The classifications are valid in both directions;
- the linear joint seal connects on one side to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned in the classifications (100 mm);
- on the other side, the linear joint seal connects to any type of wooden construction with a density of $500\pm 50 \text{ kg/m}^3$ or more where the wooden construction is placed over the full thickness of the wall or minimal thickness as mentioned in the classifications (100 mm);
- the surfaces of the material on which FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the allowed movement capability in practice is maximized to 7,5 %;
- the linear joint seal must be fully filled with FP 404 Fire Retardant PU (Gun)Foam.

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Fire resistance classification (linear joint seals in a floor)	
Bostik FP 404 connecting stone to stone	
Thickness floor ≥ 100 mm	Thickness floor ≥ 150 mm
EI 60 – H – X – F – W 8 EI 45 – H – X – F – W 8 to 20 EI 30 – H – X – F – W 20 to 30 EI 20 – H – X – F – W 30 to 40	EI 120 – H – X – F – W 8 to 20 EI 60 – H – X – F – W 20 to 30 EI 45 – H – X – F – W 30 to 40


E = Criterion integrity, I = Criterion insulation, H = Horizontal supporting construction, (floor) X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

Fire resistance classification (linear joint seals in a wall abutting a floor)	
Bostik FP 404 connecting stone to stone	
Thickness both wall and floor ≥ 100 mm	Thickness both wall and floor ≥ 150 mm
EI 60 – T – X – F – W 8 EI 45 – T – X – F – W 8 to 20 EI 30 – T – X – F – W 20 to 30 EI 20 – T – X – F – W 30 to 40	EI 120 – T – X – F – W 8 to 20 EI 60 – T – X – F – W 20 to 30 EI 45 – T – X – F – W 30 to 40

E = Criterion integrity, I = Criterion insulation, T = Horizontal application in a wall abutting a floor, X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

The following conditions apply:

- the linear joint seals may be applied at any type of floor and / or wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned above. In a floor application, the fire resistance applies from below. In a wall abutting a floor application, the fire resistance applies from both directions;
- the classifications are not valid for horizontally orientated joints in a wall;
- the surfaces of the material on which the FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the allowed movement capability in practice is maximized to 7.5 %;
- the linear joint seal must be fully filled with FP 404 Fire Retardant PU (Gun)Foam.


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Fire resistance classification (linear joint seals in a wall abutting a floor)	
Bostik FP 404 connecting stone to stone	
Thickness wall \geq 70 mm, thickness floor \geq 150 mm	Thickness wall \geq 100 mm, thickness floor \geq 150 mm
EI 45 – T – X – F – W 8 to 15 EI 30 – T – X – F – W 15 to 19	EI 60 – T – X – F – W 8 to 20 EI 30 – T – X – F – W 20 to 30

E = Criterion integrity, I = Criterion insulation, T = Horizontal application in a wall (abutting a floor), X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (fully filled joint seal)

The following conditions apply:

- the linear joint seals may be applied for a horizontal orientation in a vertical wall or a horizontal orientation in a vertical wall abutting a horizontal floor;
- the linear joint seals may be applied to any type of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned above;
- the classifications are also valid for horizontally orientated joints in a wall;
- the surfaces of the material on which the FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the allowed movement capability in practice is maximized to 7.5 %;
- the linear joint seal must be fully filled with FP 404 Fire Retardant PU (Gun)Foam.

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Classification of the fire resistance *Bostik FP 404 in combination with other Bostik FP sealants*

<p>Fire resistance classification (Bostik FP 403 in combination with Bostik FP 404)</p> <p>Bostik FP 403 Hybrid applied at the unexposed face, Bostik FP 404 applied at the exposed face</p>	
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness \geq 115 mm</p> <p>EI 180 – V – X – F – W 8 to 25 EI 240 – V – X – F – W 8 E 240 – V – X – F – W 8 to 25</p>	
<p>Vertically orientated connecting stone to wood</p> <p>Wall thickness \geq 100 mm</p> <p>EI 120 – V – X – F – W 8 to 20</p>	<p>Horizontally orientated connecting stone to wood</p> <p>Wall thickness \geq 100 mm</p> <p>EI 120 – T – X – F – W 8 to 20</p>

<p>Fire resistance classification (Bostik FP 401 in combination with Bostik FP 404)</p> <p>Bostik FP 401 Acrylic applied at the unexposed face, Bostik FP 404 applied at the exposed face</p>	
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness \geq 115 mm</p> <p>EI 180 – V – X – F – W 8 to 30 EI 240 – V – X – F – W 8 E 240 – V – X – F – W 8 to 30</p>	

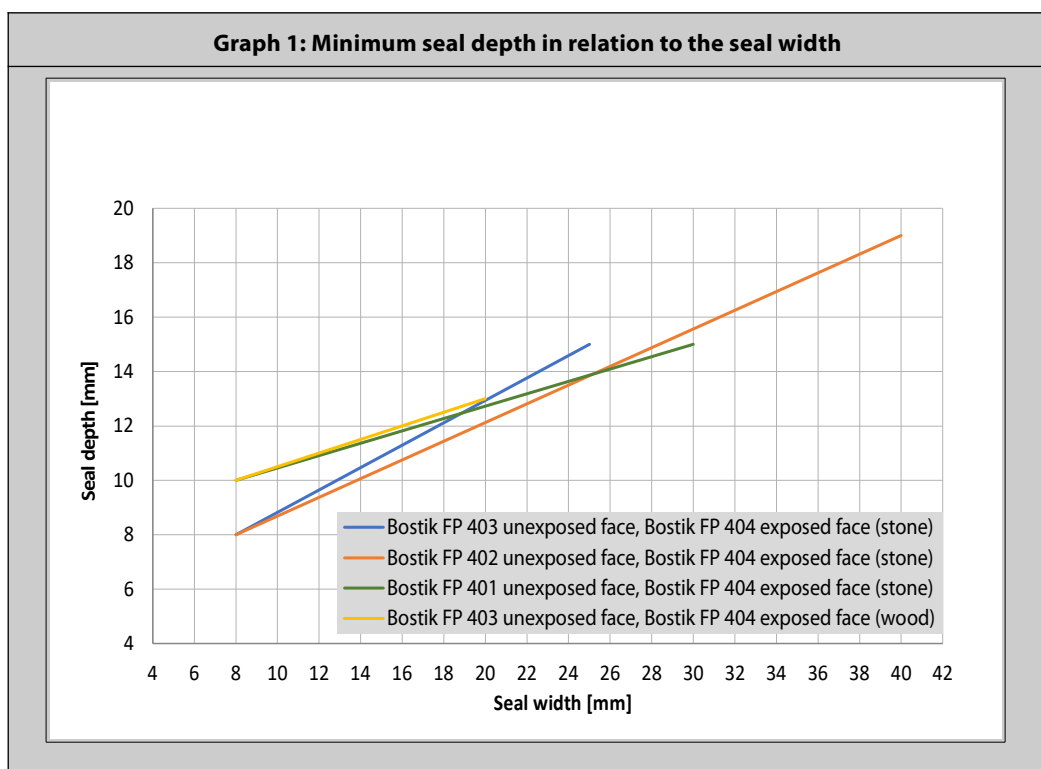
<p>Fire resistance classification (Bostik FP 402 in combination with Bostik FP 404)</p> <p>Bostik FP 402 Silicone applied at the unexposed face, Bostik FP 404 applied at the exposed face</p>	
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness \geq 115 mm</p> <p>EI 180 – V – X – F – W 8 to 40 EI 240 – V – X – F – W 8 E 240 – V – X – F – W 8 to 40</p>	

E = Criterion integrity, I = Criterion insulation, V = Vertical application in a vertical wall, T = Horizontal application in a vertical wall
X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (see Graph 1 for seal depth)

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The following conditions apply:

- the classifications are valid for linear joint seals in a wall with an orientation as mentioned (horizontal or vertical). The classifications are valid for the Bostik FP sealant applied at the unexposed face and valid in one direction;
- the linear joint seals may connect to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness as mentioned in the classifications (100 or 115 mm);
- in combination with Bostik FP 403 Fireseal Hybrid, the linear joint seals may connect to any type of wooden construction with a density of $500 \pm 50 \text{ kg/m}^3$ or more where the wooden construction is placed over the full thickness of the wall or at least 100 mm;
- the surfaces of the material on which Bostik FP sealant and FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and treated with primer and moistened with water when needed;
- the required depth of Bostik FP sealant depends on the width of the linear joint seal. The minimum depth of the Bostik FP sealant in relation to the width of the linear joint seal is shown in Graph 1 below. The required depth of the sealant may also be increased with respect to the Graph (the lines are the minimum and recommended seal depth). The rest of the slot is fully filled with FP 404 Fire Retardant PU (Gun)Foam;
- the allowed movement capability in practice is maximized to 7.5 %.



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<p>Fire resistance classification (Bostik FP 401 in combination with Bostik FP 404)</p> <p>Bostik FP 401 Acrylic applied at the exposed face, Bostik FP 404 applied at the unexposed face</p>
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness ≥ 70 mm</p> <p>EI 45 – V – X – F – W 8 to 20 E 240 – V – X – F – W 8 to 20</p>
<p>Wall thickness ≥ 100 mm</p> <p>EI 90 – V – X – F – W 8 to 30 E 120 – V – X – F – W 8 to 30 EI 30 – V – X – F – W 30 to 40</p>

<p>Fire resistance classification (Bostik FP 402 in combination with Bostik FP 404)</p> <p>Bostik FP 402 Silicone applied at the exposed face, Bostik FP 404 applied at the unexposed face</p>
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness ≥ 150 mm</p> <p>EI 60 – V – X – F – W 8 to 50</p>

<p>Fire resistance classification (Bostik FP 403 in combination with Bostik FP 404)</p> <p>Bostik FP 403 Hybrid applied at the exposed face, Bostik FP 404 applied at the unexposed face</p>
<p>Vertically orientated connecting stone to stone</p> <p>Wall thickness ≥ 100 mm</p> <p>EI 45 – V – X – F – W 8 to 40 E 120 – V – X – F – W 8 to 40</p>
<p>Wall thickness ≥ 150 mm</p> <p>EI 60 – V – X – F – W 8 to 50</p>
<p>Wall thickness ≥ 200 mm</p> <p>EI 120 – V – X – F – W 8 to 50</p>

E = Criterion integrity, I = Criterion insulation, V = Vertical application in a vertical wall, X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (depth see conditions)

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The following conditions apply:


- the classifications are valid for a vertical orientation in a vertical wall;
- the linear joint seals may be applied to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness of 70 mm, 100 mm, 150 mm or 200 mm;
- the surfaces of the material on which the sealant is applied are thoroughly cleaned and treated with Primer when needed. The the surfaces of the material on which the FP 404 Fire Retardant PU (Gun)Foam is applied are thoroughly cleaned and moistened with water when needed;
- the required depth of the Bostik FP sealant is minimal 3 mm. The rest of the slot is fully filled with FP 404 Fire Retardant PU (Gun)Foam;
- the linear joint seals are tested without mechanically induced movement, therefore the allowed movement capability in practice is maximized to 7.5 %;
- the classifications are valid for Bostik FP sealant applied at the exposed face.

<p>Fire resistance classification (Bostik FP 401 in combination with Bostik FP 404)</p> <p>Bostik FP 401 Acrylic applied at the exposed face, Bostik FP 404 applied at the unexposed face</p>
<p>(linear joint seals in a wall abutting a floor)</p>
<p>Wall thickness ≥ 70 mm / Floor thickness ≥ 150 mm</p> <p>EI 60 – T – X – F – W 8 to 19</p>
<p>Wall thickness ≥ 100 mm / Floor thickness ≥ 150 mm</p> <p>EI 120 – T – X – F – W 8 to 15 EI 60 – T – X – F – W 15 to 30</p>

E = Criterion integrity, I = Criterion insulation, T = Horizontal application in a vertical wall,
X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (depth see conditions)

The following conditions apply:

- the classifications are valid for a horizontal orientation in a vertical wall, including abutting a horizontal floor;
- the linear joint seals may be applied to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness of 70 mm or 100 mm and a floor thickness of 150 mm;
- the surfaces of the material on which the sealant is applied are thoroughly cleaned and treated with water when needed;

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- the Bostik FP 404 Fire Retardant PU (Gun)Foam is filled over the full depth of the linear joint seal and the exposed side is finished with Bostik FP 401 Fireseal Acrylic, thickness 1 mm;
- the linear joint seals are tested without mechanically induced movement, therefore the allowed movement capability in practice is maximized to 7.5 %;
- the classifications are valid for Bostik FP 401 Fireseal Acrylic applied at the exposed face.

Fire resistance classification (Bostik Stucco W-26 in combination with Bostik FP 404)
Bostik Stucco W-26 applied at the exposed face, Bostik FP 404 applied at the unexposed face
(linear joint seals in a wall abutting a floor)
Wall thickness \geq 70 mm / Floor thickness \geq 150 mm EI 45 – T – X – F – W 8 to 20
Wall thickness \geq 100 mm / Floor thickness \geq 150 mm EI 120 – T – X – F – W 8 to 19

E = Criterion integrity, I = Criterion insulation, T = Horizontal application in a vertical wall,
X = No movement applied, F = Splice applied in the field, W = Permitted width range in millimetres (depth see conditions)

The following conditions apply:

- the classifications are valid for a horizontal orientation in a vertical wall, including abutting a horizontal floor;
- the linear joint seals may be applied to any type of wall of aerated concrete (class G4/600 or heavier), concrete, block work, limestone or masonry with a minimal thickness of 70 mm or 100 mm and a floor thickness of 150 mm;
- the surfaces of the material on which the sealant is applied are thoroughly cleaned and treated with water when needed;
- the Bostik FP 404 Fire Retardant PU (Gun)Foam is filled over the full depth of the linear joint seal and the exposed side is finished with Bostik Stucco W-26, thickness 2 mm;
- the linear joint seals are tested without mechanically induced movement, therefore the allowed movement capability in practice is maximized to 7.5 %;
- the classifications are valid for Bostik Stucco W-26 applied at the exposed face.

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