

CLASSIFICATION OF FIRE RESISTANCE PERFORMANCE IN ACCORDANCE WITH BS EN 13501-2:2016

Sponsor: **British Gypsum**
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Product name: SFS EXTERNAL WALL SYSTEM WITH A 70 MM COLD-ROLLED STRUCTURAL STEEL STUD FRAMEWORK CLAD ON ONE SIDE WITH A SINGLE LAYER OF 15 MM GYPROC FIRELINE 15MM AND CLAD ON THE OTHER SIDE WITH AN INNER LAYER OF 12.5 MM GLASROC X SHEATHING BOARD 12.5MM AND AN OUTER LAYER OF 50 MM POLTERM INSULATION WITH 50 MM ISOVER APR 1200 IN THE CAVITY, INCORPORATING A 20 MM DEFLECTION HEAD

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Customer: **British Gypsum**

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1. Introduction

This classification report defines the classification assigned to element SFS external wall system with a 70 mm cold-rolled structural steel stud framework clad on one side with a single layer of 15 mm Gyproc FireLine 15mm and clad on the other side with an inner layer of 12.5 mm Glasroc X Sheathing Board 12.5mm and an outer layer of 50 mm Polterm insulation with 50 mm Isover APR 1200 in the cavity, incorporating a 20 mm deflection head, in accordance with the procedures given in BS EN 13501-2:2016.

2. Details of Classified Product

2.1 Product Description

The element, SFS external wall system with a 70 mm cold-rolled structural steel stud framework clad on one side with a single layer of 15 mm Gyproc FireLine 15mm and clad on the other side with an inner layer of 12.5 mm Glasroc X Sheathing Board 12.5mm and an outer layer of 50 mm Polterm insulation with 50 mm Isover APR 1200 in the cavity, incorporating a 20 mm deflection head, fully described below, is provided in support of the classification, listed in Clause 3.1.

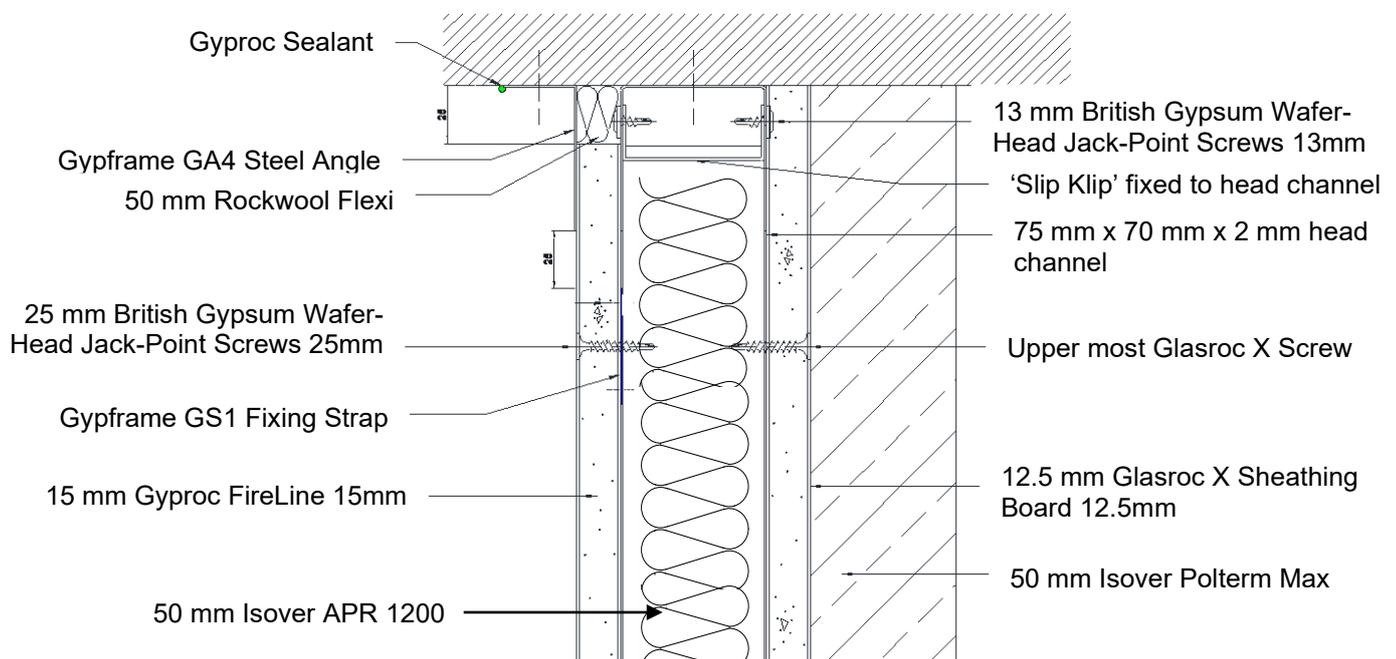


Figure 1. Vertical cross section – SFS external wall system with a 70 mm cold-rolled structural steel stud framework clad on one side with a single layer of 15 mm Gyproc FireLine 15mm and clad on the other side with an inner layer of 12.5 mm Glasroc X Sheathing Board 12.5mm and an outer layer of 50 mm Polterm insulation with 50 mm Isover APR 1200 in the cavity, incorporating a 20 mm deflection head.

Construction Details

The specimen was constructed in a refractory concrete lined steel restraint test frame with an opening of 3000 mm (high) x 3000 mm (wide).

A 75 mm x 38 mm x 1.2 mm gauge cold rolled structural steel channel was fixed to the base of the test aperture at 600 mm centres using 60 mm fire resistant fixings.

A 75 mm x 70 mm x 2.0 mm gauge cold rolled structural steel channel was fixed to the head of the test aperture at 600 mm centres using 60 mm fire resistant fixings.

70 mm x 50 mm x 1.2 mm gauge cold rolled structural steel studs were positioned at 600 mm centres between the channels. Each stud was cut 25 mm short and engaged into a 'Slip Klip' which was fixed to the head channel with 4 x 13 mm British Gypsum Wafer Head Jack-Point Screws 13mm.

The right-hand stud viewed from the plasterboard face was not fixed to the perimeter of the test frame, and the gap between the stud and the frame lining was filled with a 25 mm thick rock mineral fibre gasket (stud was cut 25 mm short).

At the left-hand edge a 70 mm x 50 mm x 1.2 mm gauge cold rolled structural steel stud was used to fix the partition to the test frame, using 60 mm fire resistance fixings at 600 mm centres (stud was cut 25 mm short).

Thermocouples were added to the studs at mid height on the web, hot and cold flanges of the central two studs.

50 mm Isover APR 1200 was placed within the stud cavity.

A Gypframe GFS1 Fixing Strap was positioned 25 mm below the bottom edge of the head channel on the unexposed face side of the partition and fixed to each stud with two 13 mm British Gypsum Wafer Head Jack-Point Screws 13mm.

The plasterboard face of the specimen was clad with a single layer of 15 mm Gyproc FireLine 15mm. All the boards were reduced to leave a 25 mm gap at the head of the specimen.

The boards were fixed with 25 mm British Gypsum Jack-Point Screws 25mm at 300 mm centres around the perimeter and within the field of the boards to all framing members except the head channel. The uppermost board fixings were positioned 130 mm below the test frame concrete soffit.

All vertical joints were staggered. A horizontal joint was positioned at 2400 mm from the base on the 15 mm Gyproc FireLine 15mm boards. A Gypframe GFS1 Fixing Strap was used behind the horizontal board joint on this face.

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On the plasterboard face the 25 mm gap above the 15 mm Gyproc FireLine 15mm boards was filled with a strip of 50 mm Rockwool Flexi stone mineral wool insulation. A continuous bead of Gyproc Sealant was applied to the 25 mm legs of Gypframe GA4 Steel Angles and fixed to the head of the of the test aperture at 600 mm centres using 60 mm fire resistant fixings. The 50 mm legs extended down to cover the deflection head gap. A butt joint was added in the Gypframe GA4 Steel Angles 1000 mm from the fixed end.

The other face of the specimen was clad with a single layer of 12.5 mm Glasroc X Sheathing Board 12.5mm. The boards were not cut short at the head. The boards were fixed with 25 mm Glasroc X Screws 25mm at 300 mm centres around the perimeter and within the field of the boards, except to the head channel. A horizontal joint was positioned at 2400 mm from the base on the 12.5 mm Glasroc X Sheathing Boards 12.5mm. The uppermost board fixings were positioned 130 mm below the test frame concrete soffit.

A continuous 6 mm bead of Glasroc X Sealant was applied along the vertical and horizontal edges of the board which had boards abutting against them. The 12.5 mm Glasroc X Sheathing Boards 12.5mm were pushed up to the previous board so that the sealant 'mushroomed' out fully sealing the joint.

50 mm Isover Polterm Max was installed over the 12.5 mm Glasroc X Sheathing Boards 12.5mm and fixed in position to the steel framework using with 70 mm diameter metal washer plates (IRD70x70-6,8) and 100 mm self-drilling stainless steel screws (SXC5-6,3 x 100mm-A2). The 50 mm Isover Polterm Max not cut short at the head.

All outer layer 15 mm Gyproc FireLine 15mm board joints were taped and filled using Gyproc Paper Joint Tape and Gyproc Joint Filler as appropriate. All screw heads were spotted using Gyproc Joint Filler.

Note. The deflection head is constructed to 25 mm to accommodate a 20 mm downward deflection. This is due to the Rockwool Flexi in the head not being able to completely compress.

3. Test Reports / Extended Application Reports and Test Results in Support of Classification

3.1 Test Reports / Extended Application Reports

Name of Laboratory	Name of Sponsor	Test Reports / Extended Application Report Nos.	Test Method / Extended Application Rules & Date
The Building Test Centre	British Gypsum	BTC 21860F and BTC 21871F	BS EN 1364-1:2015

3.2 Test Results

Test Method & Test Number	Parameter		Results
BS EN 1364-1:2015 BTC 21860F	Integrity	Sustained Flaming	138 minutes, no failure
		6 mm Gap Gauge	138 minutes, no failure
		25 mm Gap Gauge	138 minutes, no failure
		Cotton Pad	137 minutes
	Insulation		117 minutes
BS EN 1364-1:2015 BTC 21871F	Integrity	Sustained Flaming	88 minutes, no failure
		6 mm Gap Gauge	88 minutes, no failure
		25 mm Gap Gauge	88 minutes, no failure
		Cotton Pad	87 minutes
	Insulation		81 minutes

All data can be found in the relevant test report.

4. Classification and Field of Application

4.1 Reference of Classification

This classification has been carried out in accordance with clause 7.5.2 of BS EN 13501-2:2016.

4.2 Classification

The element, SFS external wall system with a 70 mm cold-rolled structural steel stud framework clad on one side with a single layer of 15 mm Gyproc FireLine 15mm and clad on the other side with an inner layer of 12.5 mm Glasroc X Sheathing Board 12.5mm and an outer layer of 50 mm Polterm insulation with 50 mm Isover APR 1200 in the cavity, incorporating a 20 mm deflection head, is classified according to the following combinations of performance parameters and classes as appropriate.

R	E	I	W		t	t	-	M	S	C	IncSlow	sn	ef	r	G	K
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Fire resistance classification: EI 60

4.3 Field of Application

This classification is valid for any of the following end use applications, as specified in BS EN 1364-1:2015:

- i) Decrease in height.
- ii) Increase in the thickness of the wall.
- iii) Increase thickness of component materials.
- iv) Decrease in the linear dimensions of the boards but not thickness.
- v) Decrease stud spacing.
- vi) Decrease in fixing centres.
- vii) Increase in the number of horizontal joints, of the type tested, when tested with one joint not more than (500±150) mm from the top edge.

Extension of Width

For test specimens tested without a supporting construction, the width of an identical construction may be increased as the specimen was tested at nominally 3000 mm wide with one vertical edge without restraint.

Extension of Height

The height of the construction may be increased by 1000 mm under the following conditions:

30 minutes	60 minutes
≤ 100 mm	≤ 100 mm

5. Limitations

This classification document does not represent type approval or certification of the product.

6. Authorisation

SIGNED



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APPROVED



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