

Assessment Number **BTC 18422FA**

A FIRE TEST ASSESSMENT COVERING THE
PERFORMANCE OF A RANGE OF SYSTEMS
INCORPORATING 15mm GYPROC SOUNDBLOC F
CONDUCTED IN ACCORDANCE WITH F.T.S.G.
RESOLUTION No. 82 / PFPF GUIDE.

Assessment Date: 16th August 2013

www.btconline.co.uk

Applicant: **British Gypsum**
East Leake
Loughborough
Leicestershire
LE12 6HX

Applicant: **British Gypsum**

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DETAILS OF THE REQUEST

It is required to compare the board performance of 15mm Gyproc SoundBloc F to 15mm Gyproc FireLine to assess the following constructions for fire resistance performance if tested in accordance with BS476: Part 22:1987 Clause 5 and BS EN 1364-1:1999.

Lightweight non-loadbearing metal stud partition systems, which consists essentially of:

Single Layer Construction

Gypframe 50/72/94FEC50 Standard Floor & Ceiling Folded Edge Channels were fixed to the head and base of the test aperture at 600mm centres using 60mm fire resistant fixings.

Gypframe 48/70/92S50 'C' Studs were positioned at 600mm centres between the channels. The right-hand stud viewed from the unexposed 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 25mm thick rock mineral fibre gasket.

At the left-hand edge a Gypframe 48/70/92S50 'C' Stud or 70/92AS50 AcouStud was used to fix the partition to the test frame, using 60mm fire resistance fixings at 600mm centres.

Both the unexposed face and the exposed face of the specimen were clad with a single layer of British Gypsum 15mm Gyproc SoundBloc F. The boards were fixed with 25mm Gyproc Drywall Screws at 300mm centres around the perimeter and within the field of the boards.

The cavity was either left unfilled, filled using 25mm/50mm/75mm(3x25mm) APR 1200 or 100mm Modular Roll.

A full board was positioned at the free end of the exposed face. A horizontal joint was positioned at 2400 mm from the base, on both faces of the specimen. A Gypframe GFS1 fixing strap was used behind the horizontal outer layer board joint.

All 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.

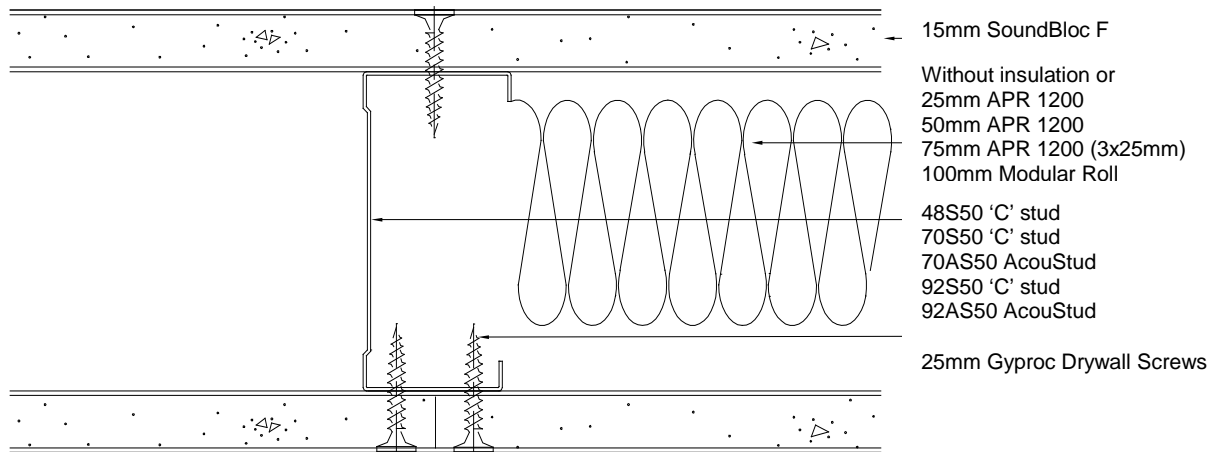


Figure 1 - Horizontal Cross Section

The table below summarises the range of 15mm SoundBloc F systems to be covered

Thickness	System	Stud	Centres	Insulation	BS Fire Claim	EN Fire Claim	Fire Height
80	Classic	48S50	600	NQ	60	60	2800
102	Classic	70S50	600	25APR	60	60	3800
102	Classic	70AS50	600	25APR	60	60	3800
102	Classic	70AS50	600	50APR	60	60	3800
124	Classic	92S50	600	25APR	60	60	4000
124	Classic	92S50	600	100MR	60	60	4000
124	Classic	92AS50	600	25APR	60	60	4000
124	Classic	92AS50	600	50APR	60	60	4000
124	Classic	92AS50	600	100MR	60	60	4000

The Building Test Centre

Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leics. LE12 6NP

Tel (0115) 945 1564

Fax (0115) 945 1562

email btc.testing@saint-gobain.com

THE ASSESSORS

The Building Test Centre operates as an independent accredited test house for the construction industry. The Building Test Centre has unrivalled experience in the development of drywall systems. The Building Test Centre is UKAS accredited under No. 0296 and 0296SI for fire resistance, reaction to fire, acoustic and structural testing. The Building Test Centre is wholly owned by British Gypsum a major manufacturer of building products.

The Building Test Centre is a founder member of the Fire Test Study Group an organisation comprising the UKAS accredited fire test laboratories conducting fire testing in the UK primarily for building control approval. The aim of the group is to ensure a common interpretation of test standards by all laboratories.



ASSESSMENT AUTHORISATION

Assessment Author

Paul Miller

BSc(Hons.),

Fire Test Manager

Reviewing Assessor

Philip Barnes

BTC Manager

Assessment Date 16th August 2013.

This assessment is not valid unless it incorporates the Declaration by Applicant form duly signed by the applicant.

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ASSESSMENT AMENDMENTS

Page	Amendments	Date

TEST EVIDENCE

The test evidence used in this assessment has been used under the authorisation of the test report owner and has been used with their permission (see Pages 20 and 21). Furthermore, the test evidence has been reviewed in accordance with Annex D of the PFPF guide to ensure that the test reports are still valid.

BTC 18406F

A FIRE RESISTANCE TEST ON A GYPWALL METAL STUD PARTITION WITH 70mm STUD FRAMEWORK CLAD EACH SIDE WITH A SINGLE LAYER OF 15mm GYPROC SOUNDBLOC F EX KIRKBY THORE, CONDUCTED IN ACCORDANCE WITH BS EN 1364 1: 1999.

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

Gypframe 72FEC50 Standard Folded Edge Floor & Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres using 60mm fire resistant fixings.

Gypframe 70S50 'C' Studs were positioned at 600mm centres between the channels. The right hand stud viewed from the unexposed 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 25mm thick rock mineral fibre gasket.

At the left-hand edge a Gypframe 70S50 'C' Stud was used to fix the partition to the test frame, using 60mm fire resistance fixings at 600mm centres.

Both the unexposed face and the exposed face of the specimen were clad with a single layer of British Gypsum 15mm Gyproc SoundBloc F. The boards were fixed with 25mm Gyproc Drywall Screws at 300mm centres around the perimeter and within the field of the boards.

All vertical joints were staggered between layers, with a full board at the free end of the exposed face. A horizontal joint was positioned at 2400mm from the base, on both faces of the specimen. A Gypframe GFS1 fixing strap was used behind the horizontal board joint.

All external 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.

The tested construction achieved the following results:

Insulation	67 minutes
Integrity	80 minutes

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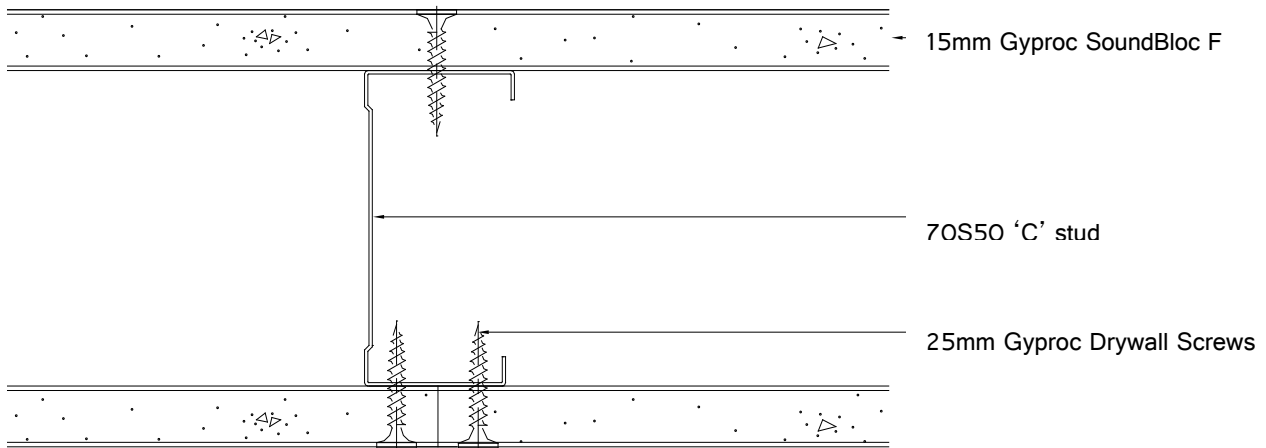


Figure 2 - Horizontal Cross Section

The test was carried out in accordance with BS EN 1364-1: 1999 taking into account Fire Test Study Group standard interpretations where appropriate. The test was carried out on the 12th August 2013 at the Building Test Centre, UKAS accreditation No. 0296. The test was carried out on behalf of British Gypsum.

BTC 18407F

A FIRE RESISTANCE TEST ON A GYPWALL METAL STUD PARTITION WITH 92MM STUD FRAMEWORK CLAD EACH SIDE WITH A SINGLE LAYER OF 15MM GYPROC SOUNDBLOC F EX KIRKBY THORE AND 100mm ISOVER MODULAR ROLL IN THE CAVITY, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1:1999.

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

Gypframe 94FEC50 Folded Edge Standard Floor and Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres using 60mm fire resistant fixings.

Gypframe 92S50 'C' Studs were positioned at 600mm centres between the channels. The right hand stud viewed from the unexposed 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 25mm thick rock mineral fibre gasket.

At the left-hand edge a Gypframe 92S50 'C' Stud was used to fix the partition to the test frame, using 60mm fire resistance fixings at 600mm centres.

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

A layer of 100mm Isover Modular Roll was positioned in the cavity.

Both the unexposed face and the exposed face of the specimen were clad with a single layer of 15mm Gyproc SoundBloc F. The boards were fixed with 25mm Gyproc Drywall Screws at 300mm centres around the perimeter and within the field of the boards.

All vertical joints were staggered between layers, with a full board at the free end of the exposed face. A horizontal joint was positioned at 2400mm from the base, on both faces of the specimen. A Gypframe GFS1 Fixing Strap was used behind the horizontal outer layer board joint.

All external 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.

The tested construction achieved the following results:

Insulation	71 minutes
Integrity	82 minutes

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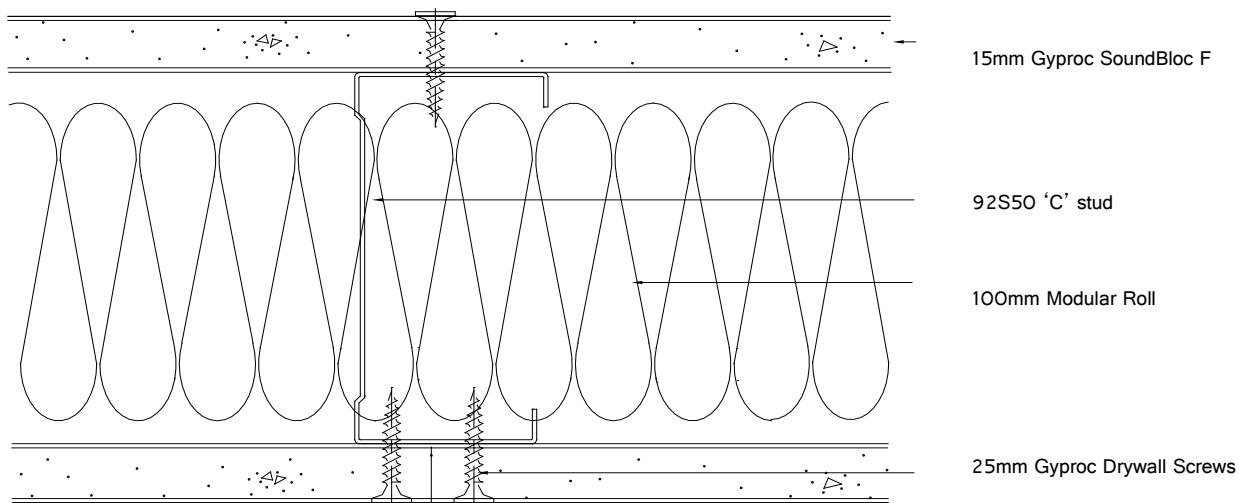


Figure 3 - Horizontal Cross Section

The test was carried out in accordance with BS EN 1364-1: 1999 taking into account Fire Test Study Group standard interpretations where appropriate. The test was carried out on the 13th August 2013 at the Building Test Centre, UKAS accreditation No. 0296. The test was carried out on behalf of British Gypsum.

BTC 12728F (reviewed 5th June 2009 BTC 16468F)

A FIRE RESISTANCE TEST ON A BRITISH GYPSUM GYPWALL PARTITION CLAD WITH A SINGLE LAYER OF 15mm GYPROC FIRELINE BOARD EACH SIDE OF GYPFRAME 70S50 STUDS, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1: 1999.

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

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres with 60mm fire resistant fixings. Gypframe 70S50 'C' Studs were positioned at 600mm centres between the channels. The right hand stud viewed from unexposed face was not fixed to the perimeter test frame, and the gap between the stud and the frame lining was filled with a 25mm rock mineral fibre gasket. At the left-hand end a Gypframe 70S50 'C' Stud was used to fix the partition to the test frame with 60mm fire resistant fixings at 600mm centres.

The framework was lined both sides with a single layer of 15mm Gyproc FireLine board fixed around the perimeter and within the field of the board with 25mm Gyproc drywall screws at 300mm centres. All joints were staggered between layers.

Horizontal joints were positioned 2700mm from the base on both the exposed and unexposed faces of the construction. A Gypframe GFS1 Fixing Strap was used behind the horizontal board joint.

All joints were taped and filled using Gyproc Paper Joint Tape and Gyproc Joint Filler. All screw heads were spotted using Gyproc Joint Filler.

The tested construction achieved the following results:

Insulation	64 minutes
Integrity	71 minutes

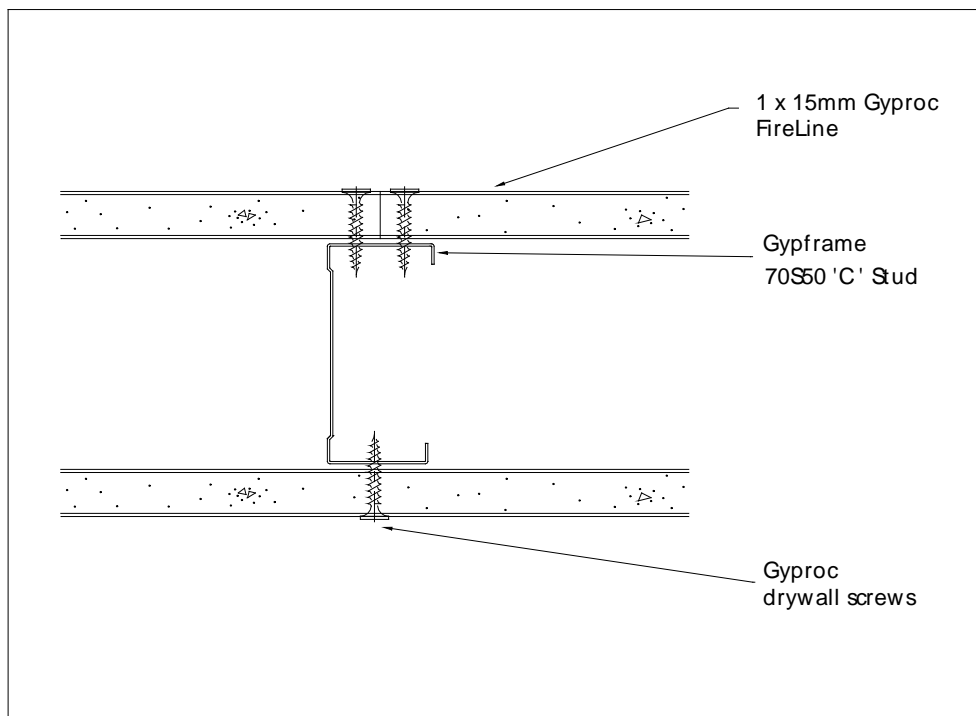


Figure 4. Cross-section of partition specimen.

The test was carried out in accordance with BS EN 1364-1: 1999 taking into account Fire Test Study Group standard interpretations where appropriate. The test was carried out on the 19th May 2003 at the Building Test Centre, UKAS accreditation No. 0296. The test was carried out on behalf of British Gypsum.

BTC 16493F

A FIRE RESISTANCE TEST ON A GYPWALL METAL STUD PARTITION WITH 92mm STUD FRAMEWORK CLAD EACH SIDE WITH A SINGLE LAYER OF 15mm GYPROC FIRELINE EX EAST LEAKE LINE 4, CONDUCTED IN ACCORDANCE WITH BS EN 1364 1: 1999.

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

Gypframe 94C50 Standard Floor and Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres using 60mm fire resistant fixings.

Gypframe 92S50 'C' Studs were positioned at 600mm centres between the channels. The right hand stud viewed from the unexposed 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 25mm thick rock mineral fibre gasket.

At the left-hand edge a Gypframe 92S50 'C' Stud was used to fix the partition to the test frame, using 60mm fire resistance fixings at 600mm centres.

Both the unexposed face and the exposed face of the specimen were clad with a single layer of British Gypsum 15mm Gyproc FireLine. The boards were fixed with 32mm Gyproc Drywall Screws at 300mm centres around the perimeter and within the field of the boards.

The cavity was filled with a single layer of 100mm thick Modular Roll.

All vertical joints were staggered between layers, with a full board at the free end of the exposed face. A horizontal joint was positioned at 2400mm from the base, on both faces of the specimen. A Gypframe GFS1 fixing strap was used behind the horizontal outer layer board joint.

All external 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.

The tested construction achieved the following results:

Insulation	68 minutes
Integrity	81 minutes

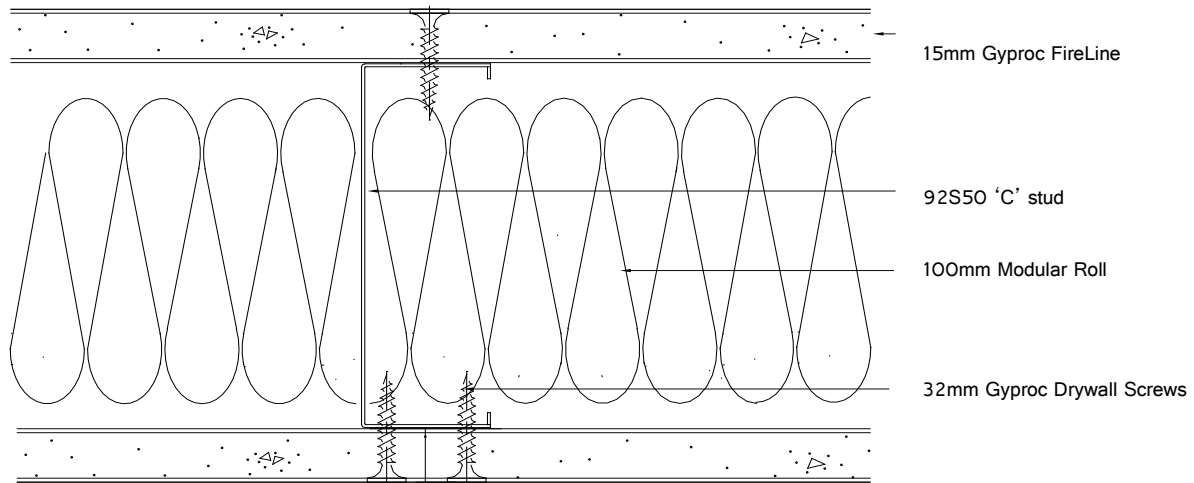


Figure 5 - Horizontal Cross Section

The test was carried out in accordance with BS EN 1364-1: 1999 taking into account Fire Test Study Group standard interpretations where appropriate. The test was carried out on the 16th June 2009 at the Building Test Centre, UKAS accreditation No. 0296. The test was carried out on behalf of British Gypsum.

DISCUSSION

With non-loadbearing lightweight steel stud constructions, the duration of fire performance is governed by the level of protection offered by the exposed face and unexposed face linings and the support provided to these linings by the steel framework and fixings.

The construction described under DETAILS OF THE REQUEST varies from the current substantiated 15mm Gyproc FireLine range and are detailed in the table below:

	Requested construction	Tested construction
1. Boards	15mm Gyproc SoundBloc F	15mm Gyproc FireLine
2. Test Standard	EN and BS	EN

Boards

The performance of 15mm Gyproc SoundBloc F can be compared directly to 15mm Gyproc FireLine when tested to BSEN 1364-1:1999 using BTC 18406F and BTC 12728F, BTC 18407F and BTC 16493F.

Comparison using a single layer board on 70mm Studs (EN) no insulation	BTC 18406F SoundBloc F	BTC 12728F FireLine
1. Insulation Performance (minutes)	67	64
2. Integrity Performance (minutes)	80	71
3. Deflection at 60minutes (mm)	53	81

Comparison using a single layer board on 92mm Studs with 100mm insulation (EN)	BTC 18407F SoundBloc F	BTC 16493F FireLine
1. Insulation Performance (minutes)	71	68
2. Integrity Performance (minutes)	82	81
3. Deflection at 60minutes (mm)	69	79

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The data in the tables above show that for systems tested, when clad with 15mm Gyproc SoundBloc F it will provide at least the same level of insulation and integrity performance to that offered by 15mm Gyproc FireLine.

A comparison of the systems deflection at 60 minutes was made between 15mm Gyproc SoundBloc F and 15mm Gyproc FireLine. It can be seen that a system clad with 15mm Gyproc SoundBloc F will not deflect any greater than a system clad with 15mm Gyproc FireLine.

From the comparison above it is reasonable to assume that the insulation and integrity performance of 15mm Gyproc SoundBloc F is at least as good as 15mm Gyproc FireLine.

Test Standard

When comparing test standards, the following are deemed to be critical to performance:

- Furnace temperature
- Furnace pressure
- Insulation failure criteria
- Integrity failure criteria
- Direct Field of Application
- Extended Field of Application

Furnace Temperature

Both BS 476: Part 22: 1987 (herewith referred to as BS standard) and BS EN 1364-1: 1999 (herewith referred to as EN standard) follow an identical temperature/time curve. However, the EN standard temperature is measured using the plate thermometer device, as opposed to the bare thermocouple wire used in the BS standard. The plate thermometer has been proven to take longer to heat up, especially during the first few minutes of a fire resistance test. The consequence of this is that far greater energy is input into the furnace.

The conclusion is that the EN standard is more onerous than the BS standard in terms of furnace temperature.

Furnace Pressure

Both the BS and EN standards assume an identical pressure gradient of 8.5pa per metre height. However, the EN standard specifies a lower neutral pressure height (500mm compared to 1000mm for BS). This leads to greater furnace pressure over the surface of the test specimen.

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Greater pressure increases the possibility of hot furnace gases escaping through fissures/openings in the test specimen, increasing the possibility of sustained flaming or cotton pad integrity failure.

Insulation failure criteria

For this type of construction, the insulation failure criteria and monitoring equipment type requirements are identical for both standards. The EN standard specifies a greater number of fixed unexposed face thermocouples, leading to an increased possibility of failure.

Integrity failure criteria

For this type of construction, the integrity failure criteria are identical for both standards. The only significant difference between the two standards is the cotton pad test:

BS standard: Distance of cotton material from specimen surface = 25mm
 Time held in position = 15 seconds

EN standard: Distance of cotton material from specimen surface = 30mm
 Time held in position = 30 seconds

Although the cotton material is positioned slightly further from the surface of the specimen, due to the additional time held in place and the greater furnace pressure, it is reasonable to assume that the EN test is at least equivalent to the BS test.

Direct Field of Application

General:

The EN standard includes a field of direct application that states:

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability.

- Decrease in height
- Increase in the thickness of the wall
- Increase in the thickness of component materials
- Decrease in linear dimension of boards or panels but not thickness
- Decrease in stud spacing
- Decrease in distance of fixing centres

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Increase in the number of horizontal joints when tested with one joint not more than 500mm from the top edge

The use of surface fixings and fixtures when tested with the fixture or fitting not more than 500mm from the top edge.

Horizontal and/or vertical joints, of the type tested.

The BS standard does not include a direct field of application, and states that test specimen shall be identical to, or representative of the building element to be evaluated. However, this older standard preceded the EN standard and the EN standard direct field of application rules have, subsequently, been adopted as assessment rules by the Fire Test Study Group, applicable to both BS and EN tests (document N817).

CONCLUSION

In view of the foregoing evidence, it is our opinion that if the constructions described under DETAILS OF THE REQUEST were subjected to fire resistance testing, in accordance with BS476: Part 22:1987 Clause 5 or BS EN 1364-1:1999, they would provide the following periods of fire resistance:

The table below is a summary of the current claims for 15mm Gyproc FireLine (supplied by British Gypsum)

PSR Number	Thickness	System	Stud	Centres	Insulation	BS Fire Claim	EN Fire Claim	Fire Height	FL Test Report
A206066	80	Classic	48S50	600	NQ	60	60	2800	BTC 11831F
A206110	102	Classic	70S50	600	25APR	60	60	3800	BTC 12729F - 50mm APR
A260A110	102	Classic	70AS50	600	25APR	60	60	3800	BTC 12729F - 50mm APR
A206A141	102	Classic	70AS50	600	50APR	60	60	3800	BTC 12729F
A206266	124	Classic	92S50	600	25APR	60	60	4000	BTC 12729F - 50mm APR
A206268	124	Classic	92S50	600	100MR	60	60	4000	BTC 16493F
A206A286	124	Classic	92AS50	600	25APR	60	60	4000	BTC 12729F - 50mm APR
NEW	124	Classic	92AS50	600	50APR	60	60	4000	BTC 12729F
A206A288	124	Classic	92AS50	600	100MR	60	60	4000	BTC 16493F

Based on the aforementioned, it is our opinion that 15mm Gyproc SoundBloc F will offer the same level of fire resistance performance as 15mm Gyproc FireLine. Therefore, for any of the British Gypsum non loadbearing FireLine systems detailed in the above table which has been subjected to a fire resistance test in accordance with -EN 1364-1:1999 can have the board component switched to 15mm Gyproc SoundBloc F with no detrimental effect on the systems fire resistant performance. This is provided that other system parameters, stud size, stud centres, fixing centres, board dimensions and quilt specification remain unchanged.

Single layer 15mm Gyproc SoundBloc F each side:

Integrity: 60 minutes
Insulation: 60 minutes

LIMITATIONS

This assessment addresses itself solely to the ability of the partition system described to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to the assessing authority the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. The assessment is valid initially for a period of five years after which time it is recommended that it be submitted to the assessing authority for re-appraisal. The opinions and interpretations expressed in this assessment are outside the scope of UKAS accreditation.

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DECLARATION BY THE APPLICANT

We the undersigned confirm that we have read and complied with the obligations placed on us by FTSG Resolution No. 82.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which this assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be subjected to a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusion of this assessment.

If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the assessment.

Signed:  Print Name ...ROB EVANS...

For and behalf of British Gypsum.

AUTHORITY FOR USE OF TEST EVIDENCE

Test Report Numbers: BTC 12728F, BTC 16493F, BTC 18406F and BTC 18407F

We the undersigned agree to the above Test Reports being used as supporting evidence for the following assessment:

A FIRE TEST ASSESSMENT COVERING THE PERFORMANCE OF A RANGE OF SYSTEMS INCORPORATING 15mm GYPROC SOUNDBLOC F CONDUCTED IN ACCORDANCE WITH F.T.S.G. RESOLUTION No. 82 /PFPF GUIDE.

Assessment client: British Gypsum

Signed:  Print Name ...ROB EVANS

Job Title: ...PROJECT LEADER

Department: ...TECHNICAL

For and behalf of **British Gypsum**