



Assessment Number **BTC 15365LC**

AN ACOUSTIC LETTER OF CONFORMITY FOR A
BRITISH GYPSUM GYPWALL ROBUST / EXTREME
HYBRID PARTITION CLAD WITH A SINGLE LAYER OF
15mm GYPROC DURALINE ON ONE SIDE AND A
DOUBLE LAYER OF 15mm GYPROC WALLBOARD AND
12.5mm GLASROC RIGIDUR H ON THE OTHER.

Assessment Date: 17th July 2007

www.btconline.co.uk

Applicant: British Gypsum Limited
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AN ACOUSTIC LETTER OF CONFORMITY FOR A BRITISH GYPSUM GYPWALL ROBUST / EXTREME HYBRID PARTITION CLAD WITH A SINGLE LAYER OF 15mm GYPROC DURALINE ON ONE SIDE AND A DOUBLE LAYER OF 15mm GYPROC WALLBOARD AND 12.5mm GLASROC RIGIDUR H ON THE OTHER.

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DETAILS OF THE REQUEST

It is required to assess the following constructions for airborne sound insulation performances of $R_w = 47\text{dB}$ (without quilt) and $R_w = 52\text{dB}$ (with 50mm quilt) if tested in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN ISO 717-1: 1997. The construction method is the same for either quilt specification.

Gypframe 72C50 Standard Flange Floor & Ceiling Channels are fixed to the head and base of the test aperture at 600mm centres with 25mm Gyproc drywall screws.

Gypframe 70AS50 AcouStuds are positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70AS50 AcouStuds are positioned between the head and base channels at 600mm centres.

A layer of insulation is positioned in the cavity as described in table 1.

The framework is clad with a single layer of 15mm Gyproc DuraLine on one side and a double layer of board, comprising an inner layer of 15mm Gyproc WallBoard and an outer layer of 12.5mm Glasroc Rigidur H, on the other.

The single layer of 15mm Gyproc DuraLine is fixed around the perimeter of the board and to intermediate stud positions using 32mm Gyproc drywall screws at 300mm centres.

The inner layer of 15mm Gyproc WallBoard is fixed around the perimeter of the boards with 32mm Gyproc drywall screws at 300mm centres.

The outer layer of 12.5mm Glasroc Rigidur H is fixed around the perimeter of the board and to intermediate stud positions with 40mm Glasroc Rigidur screws at 300mm centres.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.

	Insulation thickness and type
System One	None
System Two	50mm Isover Acoustic Partition Roll

Table 1. Quilt specifications for assessed constructions.

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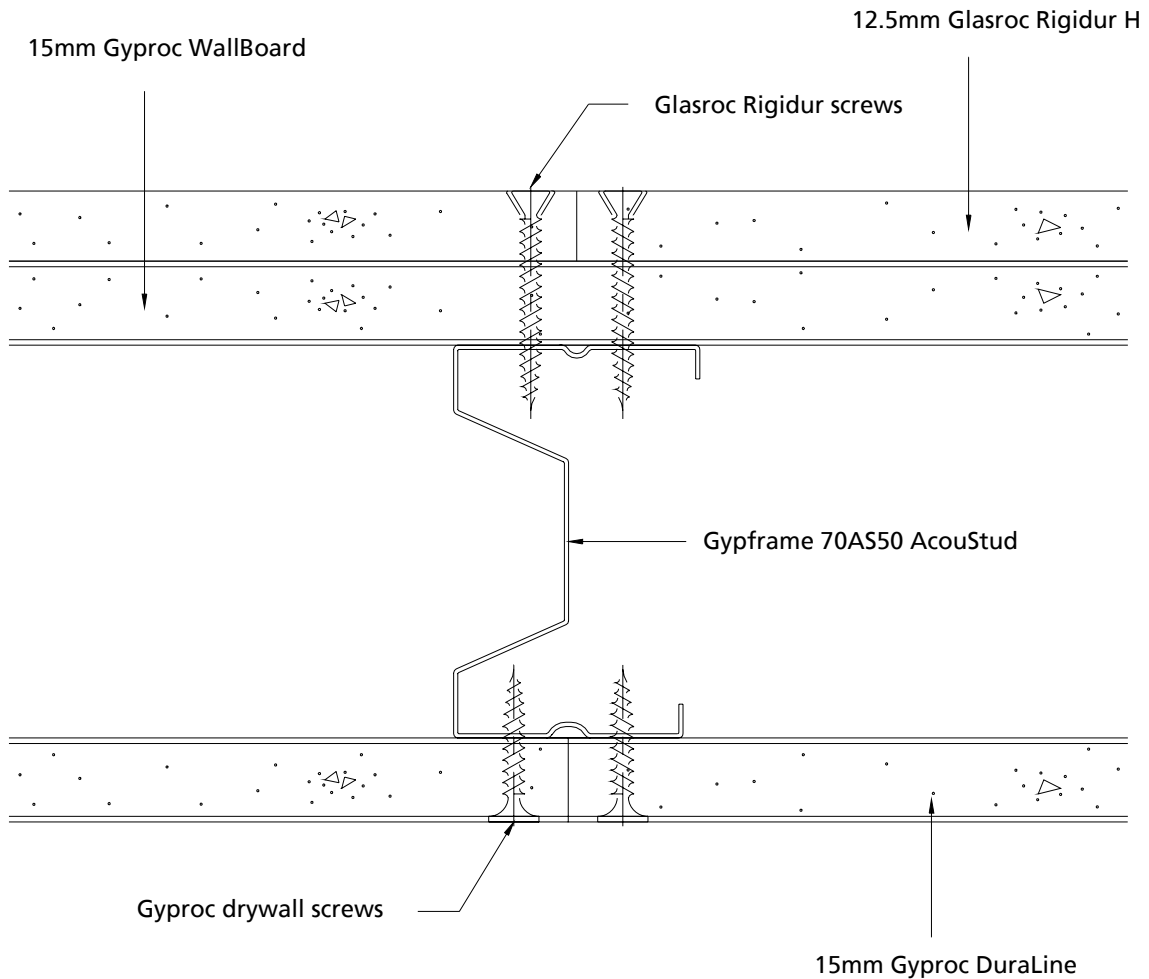


Figure 1. Cross sectional view through proposed partition system 1.

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 for fire resistance, reaction to fire, acoustic and structural testing. The Building Test Centre is wholly owned by British Gypsum Limited a major manufacturer of building products.

ASSESSMENT AUTHORISATION

Assessment Author



Robert Evans
MEng. (Hons.), AMIMechE, AIFireE, AMIOA
Project Leader

Reviewing Assessor



Alexandra Chambers
B.Eng. AMIOA
Section Manager

Assessment Date 17th July 2007.

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

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CONCLUSION

In view of the foregoing evidence, it is our opinion that if the constructions described under DETAILS OF THE REQUEST were subjected to laboratory airborne insulation testing, in accordance with BS EN ISO 140-3: 1995 and BS EN ISO 717-1:1997, they would provide the following performances:

System 1: Estimated weighted airborne sound reduction index $R_w = 47\text{dB}$
System 2: Estimated weighted airborne sound reduction index $R_w = 52\text{dB}$

LIMITATIONS

This assessment addresses itself solely to the ability of the partition system described to satisfy the criteria of a laboratory airborne sound insulation 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.

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 13 and 14). Furthermore, the test evidence has been reviewed by The Building Test Centre to ensure that the test reports are still valid.

BTC 14871A

An acoustic laboratory sound insulation test on a British Gypsum GypWall EXTREME partition clad with a single layer of 15mm Glasroc Rigidur H conducted in accordance with BS EN ISO 140-3: 1995

The specimens were constructed in a test aperture having an opening of 2400mm high x 3600mm wide.

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the aperture using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70S60 'C' Studs were positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70S60 'C' Studs were positioned between the head and base channels at 600mm centres.

Isover Acoustic Partition Roll insulation was positioned into the cavity between the studs as detailed below:

BTC 14871AA	None
BTC 14871CA	1 x 50mm

A single layer of 15mm Glasroc Rigidur H was fixed on both sides of the metal framework. The layer of boards was screw fixed around the perimeter and with in the field of the boards at 300mm centres using 40mm Glasroc S screws.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.

The tested constructions achieved the following results:

BTC 14871AA	R_w (C; Ctr) = 45 (-2; -5) dB
BTC 14871CA	R_w (C; Ctr) = 52 (-3; -6) dB

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The tests were carried out in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN ISO 717-1: 1997. The tests were carried out on the 16th October 2006 at The Building Test Centre. The tests were carried out on behalf of British Gypsum Limited.

BTC 15163A

An acoustic laboratory sound insulation test on a British Gypsum GypWall EXTREME partition clad with a single layer of 15mm Glasroc Rigidur H conducted in accordance with BS EN ISO 140-3: 1995

The specimen was constructed in a test aperture having an opening of 2400mm high x 3600mm wide.

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the aperture using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70AS50 AcouStuds were positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70AS50 AcouStuds were positioned between the head and base channels at 600mm centres.

A single layer of 15mm Glasroc Rigidur H was fixed on both sides of the metal framework. The layer of boards was screw fixed around the perimeter and with in the field of the boards at 300mm centres using 30mm Rigips Rigidur screws.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.

The tested construction achieved the following results:

BTC 15163A R_w (C; Ctr) = 47 (-2; -6) dB

The test was carried out in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN ISO 717-1: 1997. The test was carried out on the 14th March 2007 at The Building Test Centre. The test was carried out on behalf of British Gypsum Limited.

Applicant: British Gypsum Limited

BTC 14904A

An acoustic laboratory sound insulation test on a British Gypsum GypWall EXTREME partition clad with a double layer of 15mm Gyproc WallBoard and 12.5mm Glasroc Rigidur H conducted in accordance with BS EN ISO 140-3: 1995

The test specimen was constructed in an aperture having an overall opening of 2400mm (high) x 3600mm (wide).

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the aperture using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70A550 AcouStuds were positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70A550 AcouStuds were positioned between the head and base channels at 600mm centres.

An inner layer of 15mm Gyproc WallBoard and an outer layer of 12.5mm Glasroc Rigidur H were fixed on both sides of the metal framework as follows:

The inner layer of boards was screw fixed around the perimeter of the boards at 300mm centres using 32mm Gyproc drywall screws.

The outer layer of boards was screw fixed around the perimeter and with in the field of the boards at 300mm centres using 40mm Glasroc S screws.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.

The tested construction achieved the following results:

BTC 14904AA R_w (C; Ctr) = 54 (-2; -6) dB

The test was carried out in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN ISO 717-1: 1997. The test was carried out on the 30th October 2006 at The Building Test Centre. The test was carried out on behalf of British Gypsum Limited.

Applicant: British Gypsum Limited

BTC 15293A

An acoustic laboratory sound insulation test on a British Gypsum GypWall ROBUST / EXTREME hybrid partition clad with a single layer of 15mm Gyproc DuraLine on one side and a single layer of 15mm Glasroc Rigidur H on the other, conducted in accordance with BS EN ISO 140-3: 1995

The test specimen was constructed in an aperture having an overall opening of 2400mm (high) x 3600mm (wide).

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the aperture using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70S60 'C' Studs were positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70S60 'C' Studs were positioned between the head and base channels at 600mm centres.

The source room side was clad with a single layer of 15mm Glasroc Rigidur H as follows:

The layer of boards was screw fixed around the perimeter of the boards and at intermediate stud positions at 300mm centres using 40mm Glasroc Rigidur screws.

The receiving room side was clad with a single layer of 15mm Gyproc DuraLine as follows:

The layer of boards was screw fixed around the perimeter of the boards and at intermediate stud positions at 300mm centres using 32mm Gyproc drywall screws.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.

The tested construction achieved the following results:

BTC 15293A R_w (C; Ctr) = 45 (-2; -8) dB

The test was carried out in accordance with BS EN ISO 140-3: 1995 and rated in accordance with BS EN ISO 717-1: 1997. The test was carried out on the 8th June 2007 at The Building Test Centre. The test was carried out on behalf of British Gypsum Limited.

Applicant: British Gypsum Limited

DISCUSSION

With non-loadbearing lightweight steel stud constructions, the level of airborne sound insulation performance is affected by the surface density and composition of the exposed face and unexposed face linings, the width of the partition and the amount of insulation material positioned within the cavity.

The constructions detailed under DETAILS OF THE REQUEST are a combination of the linings and metal framework used in partition systems BTC 14904A and BTC 15293A. To determine whether the new system would achieve the required sound insulation performance, test evidence from both these tests and other similar tests needs to be examined.

BTC 14871A and BTC 15163A describe tests conducted on the same type of board – 15mm Glasroc Rigidur H - but using different stud components. BTC 14871A was constructed using standard Gypframe 70S60 'C' Studs whereas BTC 15163A was constructed using Gypframe 70AS50 AcouStuds. The latter partition achieved an acoustic sound insulation performance of $R_w = 47\text{dB}$, which was 2dB higher than the standard stud construction.

The above test evidence shows that a construction tested using standard Gypframe C Studs achieves a higher performance when the studs are replaced with Gypframe 70AS50 AcouStuds.

Applying this assumption to BTC 15293A, the acoustic performance of the system would be increased from $R_w = 45\text{dB}$ to $R_w = 47\text{dB}$ – the required acoustic performance for System One construction detailed under the DETAILS OF THE REQUEST.

Both constructions detailed under the DETAILS OF THE REQUEST are lined with a double layer comprising 15mm Gyproc WallBoard and 12.5mm Glasroc Rigidur H compared to the single layer of 15mm Glasroc Rigidur H used in BTC 15293A. Changing the linings will only affect the performance if the weights of the new boards are lighter than those tested. To ensure there is no performance decrease due to the proposed change, the total surface density of the two boards must be equal to the single layer of 15mm Glasroc Rigidur H.

15mm Gyproc WallBoard weighs approximately 10kg/m^2 and 12.5mm Glasroc Rigidur H weighs approximately 15kg/m^2 , making the total surface density approximately 25kg/m^2 ; 15mm Glasroc Rigidur H weighs approximately 18kg/m^2 . The double layer is actually 33% heavier than the single layer lining so there will be no downgrade in performance. By increasing the weight there will be an acoustic benefit in the mass-controlled part of the frequency range, hence the partitions will achieve the required acoustic performances more robustly.

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For further evidence, BTC 14904A describes an acoustic test conducted on a partition clad on both sides with a double layer comprising 15mm Gyproc WallBoard and 12.5mm Glasroc Rigidur H. The system achieved $R_w = 54\text{dB}$; 7dB above the required performance for System 1.

System 2 detailed under DETAILS OF THE REQUEST includes 50mm Isover Acoustic Partition Roll in the cavity. The acoustic performances measured in BTC 14871AA and BTC 14871CA, show there was a 7dB benefit gained from the inclusion of the quilt in the partition. Assuming a similar benefit would be measured for the System 2 construction and taking into consideration the above arguments, the required performance of 52dB would be achieved.

From the above discussions it can be concluded that the System 1 and 2 constructions proposed under DETAILS OF THE REQUEST would achieve a laboratory airborne sound insulation performance of 47dB and 52dB, respectively, when tested in accordance with BS EN ISO 140-3: 1995 and BS EN ISO 717-1:1997.

DECLARATION BY THE APPLICANT

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

For and behalf of British Gypsum Limited.

AUTHORITY FOR USE OF TEST EVIDENCE

Test Report Numbers: BTC 14871A, BTC 15163A, BTC 14904A and BTC 15293A

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

AN ACOUSTIC LETTER OF CONFORMITY FOR A BRITISH GYPSUM GYPWALL ROBUST / EXTREME HYBRID PARTITION CLAD WITH A SINGLE LAYER OF 15mm GYPROC DURALINE ON ONE SIDE AND A DOUBLE LAYER OF 15mm GYPROC WALLBOARD AND 12.5mm GLASROC RIGIDUR H ON THE OTHER.

Assessment client: British Gypsum Limited

Signed: Print Name

Job Title:

Department:

For and behalf of **British Gypsum Limited**

Applicant: British Gypsum Limited