The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

Assessment Number **BTC 12980FA**

FIRE RESISTANCE EXPERT JUDGEMENT COVERING THE PERFORMANCE OF BRITISH GYPSUM GYPWALL QUIET PARTITION AT THE COLD STATE HEIGHT CONDUCTED IN ACCORDANCE WITH F.T.S.G RESOLUTION No. 82 / PFPF GUIDE.

Assessment Date: 18th August 2003

www.btconline.co.uk

Applicant:

British Gypsum Limited
Head Office
East Leake
Loughborough
Leicestershire
LE12 6HX

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

FIRE RESISTANCE EXPERT JUDGEMENT COVERING THE PERFORMANCE OF BRITISH GYPSUM GYPWALL QUIET PARTITION AT THE COLD STATE HEIGHT CONDUCTED IN ACCORDANCE WITH F.T.S.G RESOLUTION No. 82 / PFPF GUIDE.

TABLE OF CONTENTS

The Building Test Centre
Fire Acoustics Structures

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

FOREWORD

British Gypsum GypWall QUIET metal stud separating wall is a lightweight, non-loadbearing, twin framed wall system.

This assessment is to be used in conjunction with report BTC 12103F. The report details a fire resistant test on 5m high British Gypsum GypWall QUIET partition clad with an inner layer of Gyproc Plank and an outer layer of Gyproc SoundBloc.

The assessment applicant is British Gypsum Limited.

DETAILS OF THE REQUEST

To show a British Gypsum GypWall QUIET partition will achieve a fire resistance performance of 60 minutes at the cold state height in accordance with BS EN 1364-1: 1999.

ASSESSMENT AUTHORISATION

Assessment Author

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

Authorised by

Eur Ing. Paul Howard
BSc. (Hons.), CEng., MIOA
Head of Laboratory

Assessment Date 18th August 2003.

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

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.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 Limited 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.

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

DISCUSSION

According to test report BTC 12103F, 5m high British Gypsum GypWall QUIET partition test specimen was constructed as follows:

GypFrame 50C50 channels were fixed to the head and base of the test aperture and GypFrame 48S50 studs were positioned at 600mm centres between the channels. Each 5000mm length of stud comprised of one full 3000mm length plus a second length 2600mm long, overlapped by 600mm and fixed together using two GypFrame Wafer Head screws.

A second metal framework was installed as above offset by 37mm. Short sections of GypFrame fixing channel 99FC90 were fixed horizontally between the two metal frameworks at 1200mm centres using two 13mm GypFrame Wafer Head screws into each metal stud.

25mm Isowool Acoustic Partition Roll (1200) was located within the centre of the 37mm gap.

A single horizontal layer of 19mm Gyproc Plank was fixed to both sides of the framework using two 32mm Gyproc Drywall screws to each metal stud. An outer layer of 12.5mm SoundBloc was fully fixed vertically to both sides and to all the studs and channels using 42mm Gyproc Drywall screws at 300mm centres. The horizontal joints for the outer layers were positioned 2700mm from the base for both the exposed and unexposed sides of the construction. All vertical board joints were staggered between layers on both sides.

All board joints were taped and filled using Gyproc Paper Joint Tape and Gyproc Joint Filler as appropriate.

To show that a British Gypsum GypWall QUIET partition will achieve a fire resistance performance of 60 minutes at the cold state height in accordance with BS EN 1364-1: 1999 the following factors must be considered:

- The application of the lateral deflection rule to partitions tested above 3000mm.
- The application of the engineering appraisal to a twin-framed system.
- The structural behaviour of a twin-framed system.
- The weight distribution of the boards on the twin frame.

The following test evidence can be used to show that a British Gypsum GypWall QUIET partition will achieve a fire resistance performance of 60 minutes at the cold state height in accordance with BS EN 1364-1: 1999.

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

BTC 12103F

Details a 5m high British Gypsum GypWall QUIET partition clad with an inner layer of 19mm Gyproc Plank and an outer layer of 12.5mm Gyproc SoundBloc on two independent GypFrame metal stud frames each incorporating 48mm wide studs.

Deflection at 60 minutes 103.8mm.
Insulation failure 97 minutes.

To perform an expert judgement on the extension of the height of the specimen is allowed under BS EN 1364-1: 1999 providing that the tested construction satisfies the following conditions:

i) If the maximum lateral deflection of the test specimen was not in excess of 100mm.
ii) The vertical expansion allowances are increased pro rata.

But these conditions only apply to test specimens tested at 3m high not to test specimens tested above 3m high. Therefore the deflection limit of 100mm is not suitable for specimens tested at 5m high. There is no guidance given in either BS EN 1364-1: 1999 or the FTSG Principles For Fire Resistance Assessments for the application of data from specimens that were tested above 3m. Therefore it is the opinion of the assessor that decides whether the data is suitable for an expert judgement regarding the extension of the height of the specimen.

For this assessment on a British Gypsum GypWall QUIET partition the test data at 60 minutes was suitable, in the opinion of the assessor, for an expert judgement.

Insulation failure at:	97 minutes.	
Deflection at 60 minutes:	103.8mm	
Exposed face frame stud data:	Hot flange	= 416°C
	Web	= 354°C
	Cold flange	= 326°C
Corresponding unexposed face frame stud data:	Hot flange	= 196°C
	Web	= 126°C
	Cold flange	= 98°C

The methodology used to perform the expert judgement regarding the extension in height of the British Gypsum GypWall QUIET partition is given in the FTSG Principles For Fire Resistance Assessments. The methodology only applies to single stud frames so the following factors need to be considered:

i) How will the methodology be applied to the studs used in a twin-framed system.
ii) How will the test data be applied in the methodology.

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

British Gypsum GypWall QUIET compromises two independent metal stud frames. These frames are spaced as required and are cross-braced using short lengths of GypFrame Fixing Channel. On the outer faces of the framing a single layer of 19mm Gyproc Plank and a single layer of 12.5mm Gyproc SoundBloc were screw fixed.

Each frame was considered to be independent and the cross bracing had no affect on the frame's behaviour during the fire test. When the exposed face frame became unstable the unexposed face frame would only support the boards attached to that framing. As only one side of each frame was boarded the surface mass of each frame was only half the total wall surface mass. Using these assumptions the methodology was applied to each frame.

Internal thermocouples were placed on the flanges and webs of both frames of the test specimen. The most onerous stud temperatures on the exposed face frame were at mid-height but the most onerous stud temperature on the unexposed face was at three-quarter height. The strength of the unexposed face frame is more critical than the strength of the exposed face frame. Therefore the stud temperatures on both frames at three-quarter height were used.

The expert judgement determined the exposed face frame was unstable at 60 minutes at a fire height equal to the cold state height (6200mm). But the judgement showed the exposed face frame was stable until 59 minutes. Maximum head drop of the partition was –39.03mm vertically downwards at 60 minutes.

The expert judgement determined the unexposed face frame was stable at 60 minutes at a fire rated height of 6600mm. Maximum head drop of the partition was –33.63mm vertically downwards at 60 minutes.

Therefore, it can be concluded that a British Gypsum GypWall QUIET partition clad with a single layer of 19mm Gyproc Plank and a single layer of 12.5mm Gyproc SoundBloc will achieve a fire resistance performance of 60 minutes at the cold state height in accordance with BS EN 1364-1: 1999.

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

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. 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 12103F

Details a 5m high British Gypsum GypWall QUIET partition clad with an inner layer of 19mm Gyproc Plank and an outer layer of 12.5mm Gyproc SoundBloc on two independent GypFrame metal stud frames each incorporating 48mm wide studs. The test was carried out in accordance with BS EN 1364-1: 1999 at The Building Test Centre on 30th May 2002.

Time to Insulation Failure
97mins

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 two 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.

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

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 .....

For and behalf of British Gypsum Limited.

The Building Test Centre
Fire Acoustics Structures

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com

AUTHORITY FOR USE OF TEST EVIDENCE

Test Report Numbers: BTC 12103F

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

FIRE RESISTANCE EXPERT JUDGEMENT COVERING THE PERFORMANCE OF BRITISH GYPSUM GYPWALL QUIET PARTITION AT THE COLD STATE HEIGHT CONDUCTED IN ACCORDANCE WITH F.T.S.G RESOLUTION No. 82 / PFPF GUIDE.

Assessment client: British Gypsum Limited

Signed: ..... Print Name .....

Job Title: .....

Department: .....

For and behalf of **British Gypsum Limited**