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### Compliance with the New Zealand Building Code (NZBC)

Under normal conditions of dry internal use GIB® Fire Rated Systems have a serviceable life in excess of 50 years and satisfy the requirements of NZBC Clause B2 – Durability.

GIB® Fire Rated Systems can be used to provide passive fire protection in accordance with the requirements of NZBC Clause C3 – Spread of Fire.

In order to satisfy the requirements of NZBC Clause C4 – Structural Stability during Fire, designers must ensure that fire rated elements are supported by elements having at least the same Fire Resistance Rating (FRR). Collapse of elements having a lesser FRR shall not cause the consequential collapse of elements required to have a higher FRR.

System components that have not been specified (e.g., 'framing' in universal systems) may be used subject to the normal approval process.

### Appraisal

This document entitled 'GIB® Fire Rated Systems 2006' has been appraised by The Building Research Association of New Zealand (BRANZ) Appraisal Certificate No. 289 (2006).

### Limitations

GIB® Plasterboard must be stacked flat and protected from the weather.

GIB® Plasterboard must be handled as a finishing material.

GIB® Plasterboard linings in use must not be exposed to liquid water or be installed in situations where extended exposures to humidities above 90% RH can reasonably be expected.

**Adhesive fixing can not replace mechanical fasteners in GIB® FRR systems.**

### Product Identification

To allow positive identification of GIB Fyreline® on site, the face paper of the board is coloured pink.

### Quality Control

The FRRs of the published systems have been obtained by independent testing and opinions sourced from organisations with accredited quality assurance. It is of prime importance to pay strict attention to the details of design, construction and workmanship, otherwise the FRR of the system could be significantly degraded.

GIB® Plasterboard is manufactured to strict quality standards and all sheet products have a uniform formulation nation-wide.

### Design Guidelines

#### Substitution

When 10mm GIB Braceline®, 10mm GIB Noiseline®, 10mm GIB Ultraline®, 10mm GIB Toughline®, or

10mm GIB Aqualine® are substituted into fire rated systems in place of 10mm GIB Fyreline®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13mm GIB Aqualine®, 13mm GIB Noiseline®, or 13mm GIB Toughline® are substituted for 13mm GIB Fyreline®.

Otherwise, achieving the FRR of GIB® Fire Rated Systems depends on closely following the detailed specifications. Installation of systems outside their stated scope of application, or substituting any component, will invalidate the FRR and may compromise fire safety.

#### Structural steel members with GIB® Fire Rated Systems

Structural steel members are sometimes positioned inside the cavity of a GIB® Fire Rated system, such as a steel beam inside a floor/ceiling cavity. The FRR of a GIB® wall or floor/ceiling system applies from the exposed face to the un-exposed side.

Temperatures inside the cavity can rise to levels above the critical temperature for the steel member. It can not be automatically assumed that a structural steel member achieves the stability rating of the cavity system within which it is contained. For guidance on the protection of steel columns and beams refer to pages 49 and 50 of this document. For further assistance please call the GIB® Helpline 0800 100 442.

#### Non-loadbearing timber framed walls

Designers shall consult the current edition of NZS 3604 to determine framing dimensions for wall heights up to 4.8 metres. Beyond this limit walls require specific engineering design.

Under no circumstances shall the framing spacings be more or the timber dimensions be less than those specified in this brochure.

#### Loadbearing timber framed walls

Designers shall consult the current edition of NZS 3604 to determine framing dimensions (including top and bottom plates) for wall heights up to 4.8 metres.

Beyond these limits walls require specific engineering design and for the validity of the FRR reference must be made to BTL Report FSR No.142 'Design of Loadbearing Timber Framed Walls with GIB® Plasterboard Linings for Fire Resistance', dated January 1996.

#### Non-loadbearing steel framed walls

For wall heights greater than the specified limits, reference must be made to Winstone Wallboards Ltd document 'Non-loadbearing Steel Stud Systems – Assessment of Wall Heights', dated October 1995 and associated BTL Assessment 95/843.



### Loadbearing steel framed walls

The solutions provided in this literature for loadbearing steel frame walls are conservatively based on assessments which limit the steel temperature. More accurate predictions can be made if the applied stud load (at the time of the fire) and stud capacity (at room temperature) are known. The FRR (minutes) of a loadbearing steel framed system can be calculated by referring to the non-loadbearing system with equivalent linings and applying the following equation;

$$FRR (LB) = FRR (NLB) - \{Applied Load (kN/stud)/Capacity (kN/stud)\} \times FRR (NLB)$$

#### EXAMPLE:

A loadbearing steel frame has an applied stud load of 4kN at the time of the fire and a design capacity of 12kN per stud.

The linings are 13mm GIB Fyreline® on each side of the frame. The equivalent non-loadbearing system is GBS60. The FRR of the loadbearing system can be estimated as  $60 - (4/12) \times 60 = 40$  minutes.

If 16mm GIB Fyreline® linings are used then the equivalent non-loadbearing system is GBS90. The FRR of the loadbearing system can be estimated as  $90 - (4/12) \times 90 = 60$  minutes.

### Loadbearing floor/ceiling systems

These systems have generally been tested for a design live load of 3kPa and a span of 4 metres. In order to extend beyond these limits, reference shall be made to the extrapolation rules for loadbearing floors given in BRANZ TR No.9 'Design of Light Timber Framed Walls and Floors for Fire Resistance'.

Do not increase the joist or nog spacing from those specified.

Do not decrease the joist dimensions from those specified.

Do not exceed the maximum permissible design stress.

Do not substitute alternative type joist to those specified.

Do not increase the curvature of the system as calculated by a structural engineer.

For ease of reference with respect to floors up to a load of 1.5, 2 and 3 kPa, consult the design tables of NZS 3604.

### Loadbearing capability

LB = Loadbearing (system supports other parts of the structure)

NLB = Non-loadbearing (system supports own weight only)

### Surface finish properties, without paint or wallpaper finish – AS/NZS 1530.3

PRODUCT	SPREAD OF FLAME INDEX	SMOKE DEVELOPED INDEX
GIB Fyreline®	0	4
GIB Braceline®	0	4
GIB® Standard	0	5
GIB Aqualine®	0	5
GIB Ultraline®	0	5

Note: For paint, wallpaper or similar finishes, contact the relevant supplier or manufacturer in respect of Surface Finish Properties for their products.

### Flame Barrier

The approved document for NZBC Fire Safety clauses requires the use of flame barriers in certain situations, principally to delay the ignition of combustible foam plastics.

GIB® Plasterboard (of any type) not less than 10mm thick is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing or back-blocked with GIB® Plasterboard.

### Fire Resistance of Clad Walls

Where GIB® Fire Rated Partition Systems are clad with the following materials, the GIB® lining may be left unstopped without prejudice to the FRR:

- timber and wood based products
- steel, flat or profiled
- fibre cement boards
- exterior insulation and finish systems (EIFS)

### Sound Control

If a level of sound control higher than those ratings published in this brochure is required then reference should be made to the publication entitled 'GIB® Noise Control Systems'.

**Nomenclature**

**Specification Reference**

L = Loadbearing system  
(notation used for loadbearing walls only)

A = Acoustic system  
(notation used for specific sound control systems only)

System example:

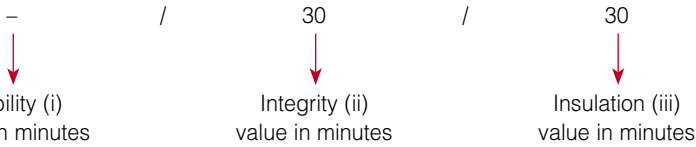


GIB® Plasterboard

- T = Timber frame wall
- S = Steel frame wall
- UW = Universal Wall
- FC = Floor/Ceiling
- SC = Suspended Ceiling
- UC = Universal Ceiling
- CJ = Composite Joists

**Fire Resistance Rating (FRR)**

**Examples:**



- i) Stability – To prevent collapse of structural (primary) elements during a fire. Brackets, e.g. (30)/30/30 indicate that the system may be loadbearing or non-loadbearing depending on the design. Dash (-) indicates a nil rating, e.g. -/30/30 is NLB.
- ii) Integrity – To prevent the passage of flame or hot gases through the fire separations or external walls or roofs.
- iii) Insulation – To prevent the transmission of heat to other firecells or adjacent property.

**GIB® Sheet Sizes & Weights**

GIB® STANDARD		
SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE)		BOARD WEIGHTS
Thickness (mm)	Length (mm)	Maximum Weight
10.0	2400, 2700, 3000, 3300, 3600, 3900, 4200, 4800, 6000	6.90 kg/m <sup>2</sup>
13.0	2400, 2700, 3000, 3300, 3600, 4200, 4800, 6000	8.90 kg/m <sup>2</sup>

GIB FYRELINER®		
SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE)		BOARD WEIGHTS
Thickness (mm)	Length (mm)	Maximum Weight
10.0	2400, 2700, 3000, 3600	7.00 kg/m <sup>2</sup>
13.0	2400, 2700, 3000, 3300, 3600	9.80 kg/m <sup>2</sup>
16.0	2400, 2700, 3000	14.15 kg/m <sup>2</sup>
19.0	2400, 3000	16.60 kg/m <sup>2</sup>

GIB ULTRALINE®		
SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE)		BOARD WEIGHTS
Thickness (mm)	Length (mm)	Maximum Weight
10.0	3000, 3600, 4800, 6000	7.00 kg/m <sup>2</sup>

**Note:** A special cut to length service is available. Please call the GIB® Helpline for more information on this service.