# INTRASTACK
## TECHNICAL MATRIX

# STEEL FRAME

CREATING CERTAINTY AT THE CORE OF ANY STEEL FRAME PROJECT.

INTRASTACK

SAINT-GOBAIN

# CONTENTS



# › INTRASTACK
# WALL BUILD-UP MATRIX
## FIRE AND ACOUSTIC PERFORMANCE STANDARDS

## Fire Performance Tests & Fire Resistance

Intrastack has carried out extensive through-wall fire testing to cover our most commonly used wall build-ups. These constructions offer a range of fire, thermal and acoustic performances. On the following pages we provide information on our fire test performance results to allow you to specify the correct build up for your project.

## Fire testing on two sides

The level of fire protection provided by the installed boards to light steel frame structures is determined by fire testing of loaded walls exposed to fire on each side separately. Symmetrical walls provide the same fire performance from each side and are only tested from one side. Non-symmetrical walls, such as external walls perform differently from each side and are tested from both sides separately. All tests are carried out to BS EN 1365-1:2012 with guidance from Approved Document B.

We also have a number of tested build ups that have been exposed to heating from both sides at the same time, please contact your Intrastack technical representative for further details of two sided testing.

## Understanding Fire Resistance in Construction

Fire resistance is crucial for ensuring the safety and stability of building structures. It refers to the ability of a construction element or system to uphold three key properties during a fire:

**(R) Load-bearing capacity – Resistance to Collapse**
Load-Bearing Capacity: The ability to maintain structural load-bearing support without the loss of strength.

**(E) Integrity**
The capacity to withstand exposure to fire and heat, preventing the passage of flames and hot gases.

**(I) Thermal Insulation**
The capacity to limit heat transfer to the unexposed (cold) side when fire is introduced to the other side of the wall.

## Fire Resistance Classifications

The standard fire resistance rating values are 30, 45, 60, 90, 120, 180 and 240 minutes. This rating typically means the period during which a passive fire protection system / construction element can withstand a standard fire resistance test.
This can be quantified simply as a measure of time or instead, it may entail a host of other criteria, e.g. other evidence of functionality or fitness for purpose.

**Intrastack has tested wall build-ups performing from 30min to 120min and can accommodate a variety of build types, from apartments and hotels to low-rise housing developments.**

# SERVICES

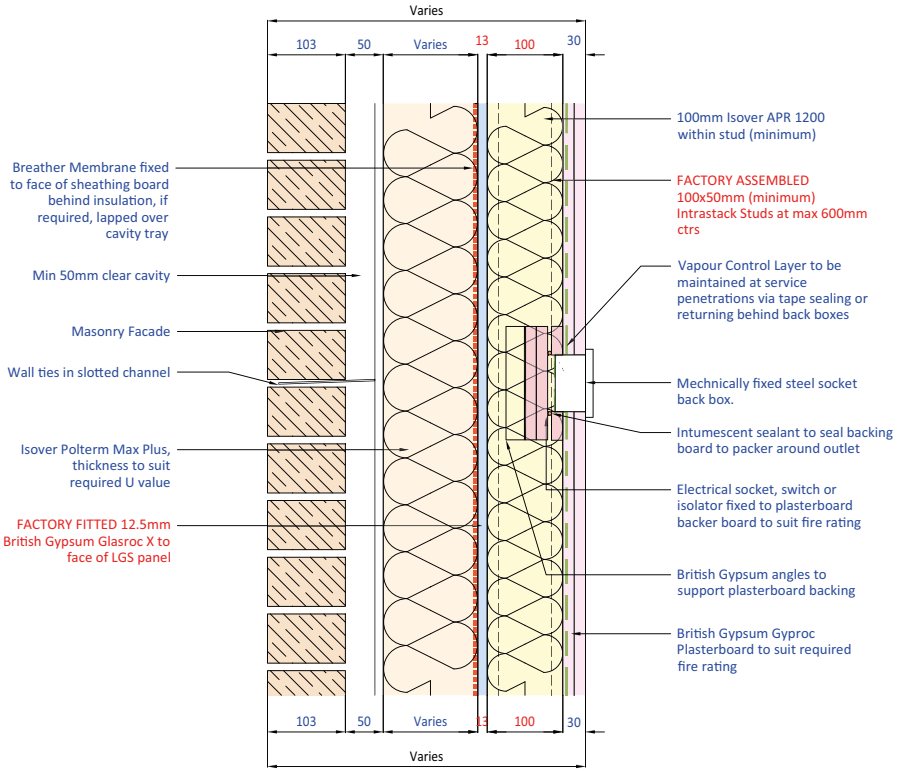
## STANDARD DETAILS

Service voids within load bearing panels require fire protection to match the performance of the rest of the wall, Intrastack have a number of standard details that can be used as part of the overall fire strategy for your project.

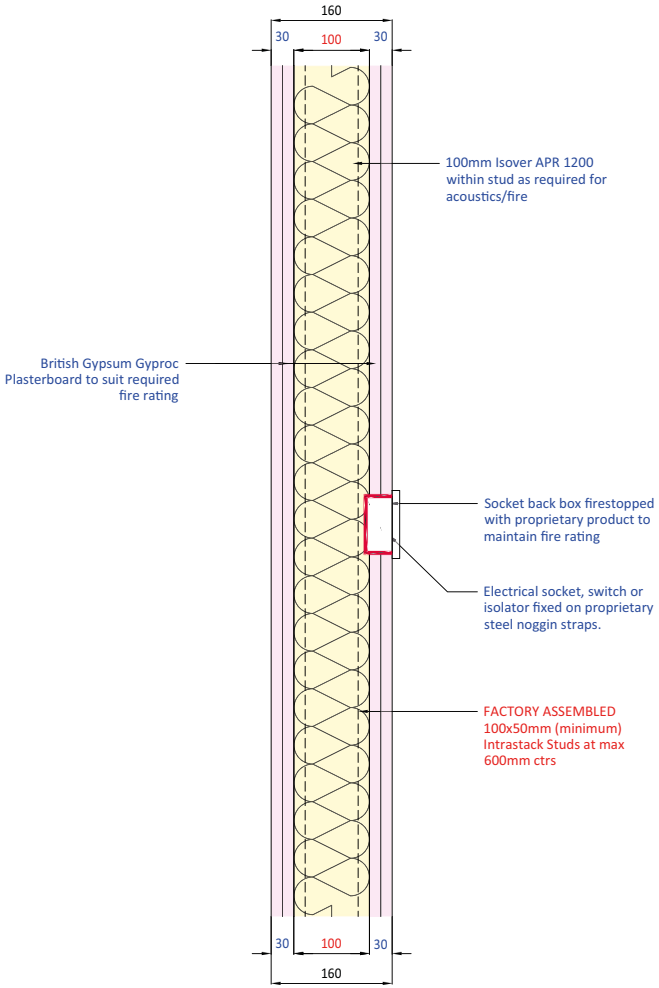
Your Intrastack point of contact will be able to advise further on the standard details available for service penetrations.

**Examples of standard details**

### Loadbearing Wall Baffle Box




### Electric Back Box - Loadbearing Wall

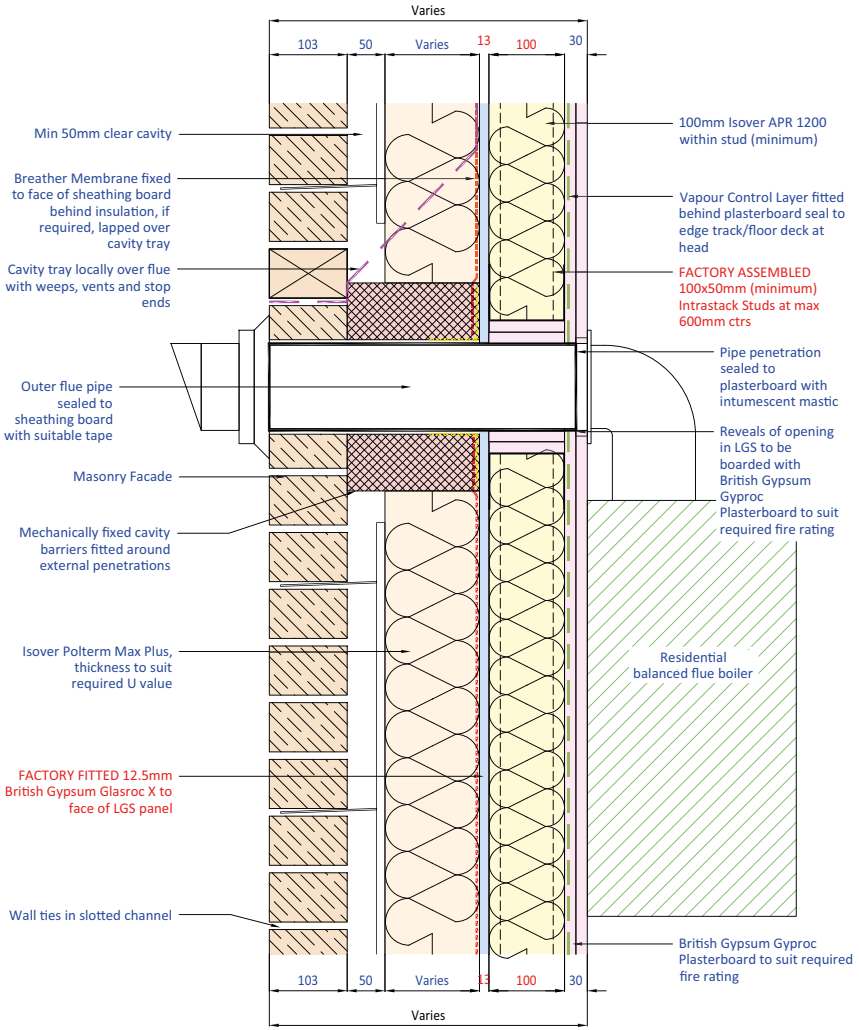


# INTRASTACK
## WALL BUILD-UP MATRIX

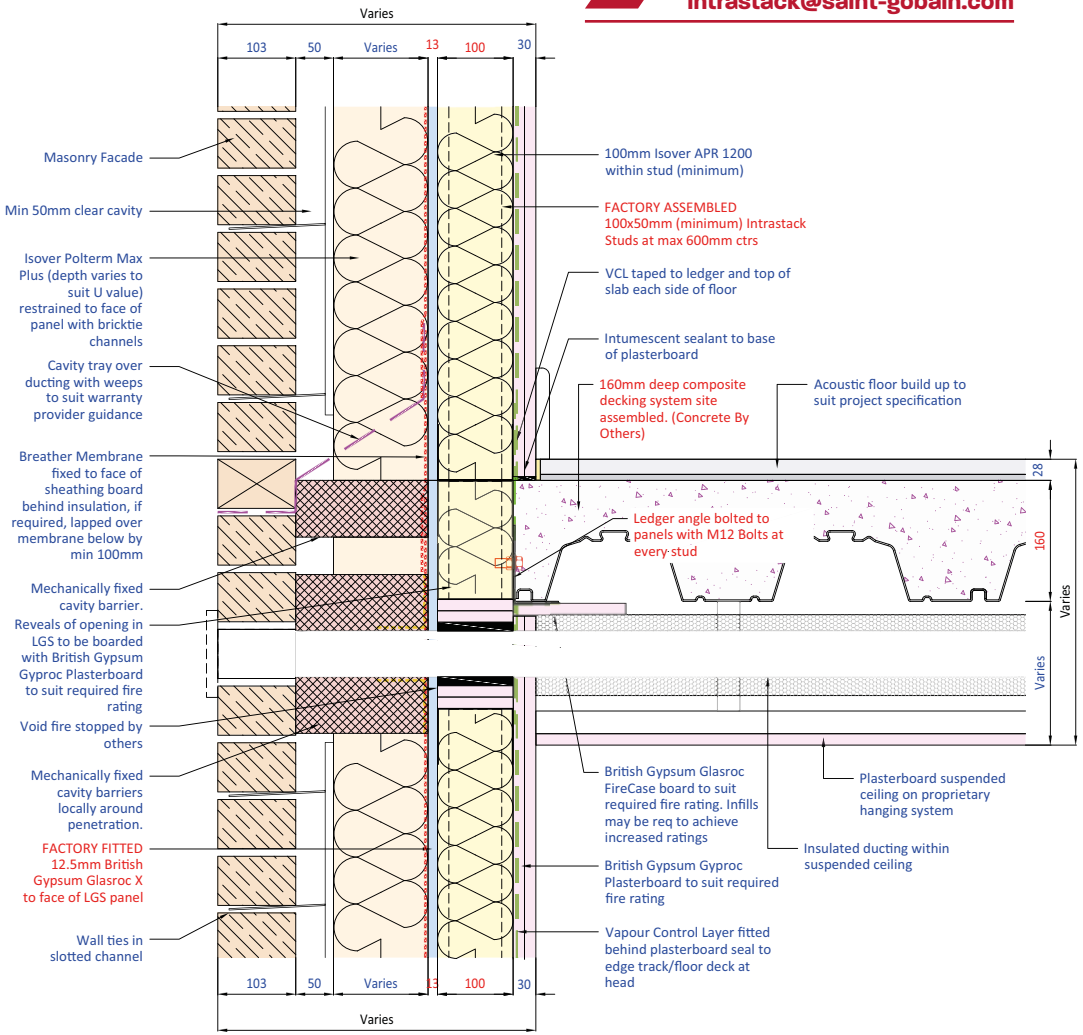
Please contact the intrastack technical team for further details.

**intrastack@saint-gobain.com**

## Boiler Flue Penetration



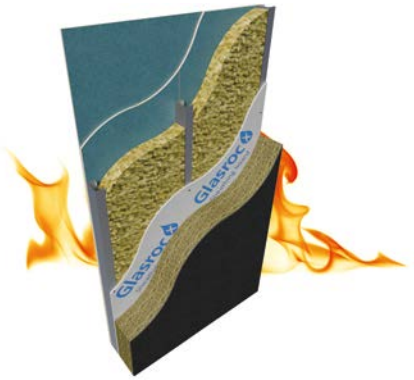

## External Ventilation Penetration



# LOAD BEARING WALLS

## LOADED WALLS – 60MINS

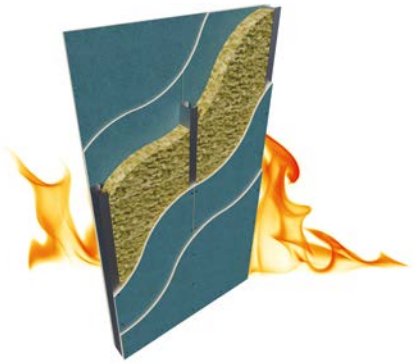
Fire performance
**60 minutes**
(tested to BS EN 1365-1:2012)




### 1. 60 Minute External Wall

- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (fireside)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 1 layer 12.5mm British Gypsum Glasroc X sheathing board (non-fireside)
- 1 layer 200mm Isover Polterm Max Plus Insulation

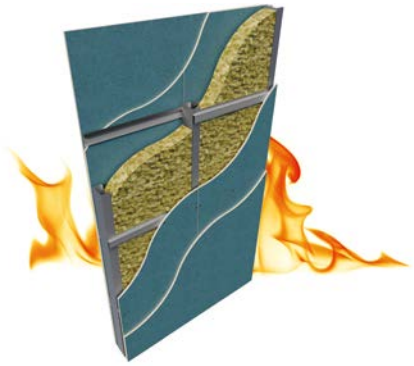
**Notes** - Minimum 100mm Polterm Max Plus
- Alternative board option 2 x 12.5mm Fireline. Test report no. EUI-22-000089-B, in-to-out only.
- Alternative external board option 9mm Cembrit Windstopper. Test report no. EUI-22-000090-C & P125587-1001.



### 2. 60 Minute Internal Wall

- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (fireside)
- 100mm loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (non-fireside)

**Note** - Where heavy loads are to be hung from walls, the inner layer may be replaced with 1 x 12.5mm Habito. Test report no. P112827-1007.



### 3. 60 Minute Party Wall

- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (fireside)
- British Gypsum Gypframe Resilient Bar (RB1)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- British Gypsum Gypframe Resilient Bar (RB1)
- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (non-fireside)

### Note – Socket Penetrations

Intrastack has carried out additional testing to demonstrate the performance of a light weight steel framed 60 minute fire performance wall with socket penetrations, please contact the intrastack technical team for further details.

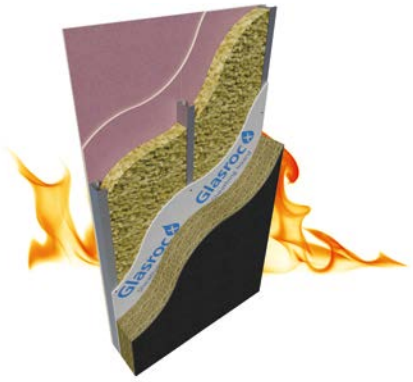
| Option | Name | Stud depth (min) | Tested in accordance with | Tested duration (mins) | Fire Test Ref. | Typical Acoustic Performance (Rw dB) |
|---|---|---|---|---|---|---|
| 1 | 60 Minute External Wall | 100mm | BS EN 1365-1:2012 | 60 | P112827-1000 & 1009 | 48 to 53 |
| 2 | 60 Minute internal Wall | 100mm | BS EN 1365-1:2012 | 60 | P112827-1006 | 48 to 53 |
| 3 | 60 Minute Party Wall | 100mm | BS EN 1365-1:2012 | 60 | P112827-1005 | 58* |

*Test report BTC 23261A

# LOAD BEARING WALLS

## LOADED WALLS – 90MINS

Fire performance
**90 minutes**
(tested to BS EN 1365-1:2012)




### 1. 90 Minute External Wall

- 2 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 1 layer 12.5mm British Gypsum Glasroc X sheathing board (non-fireside)
- Isover Polterm Max Plus insulation (non-fireside)

**Notes** - Out to in perfomance tested with 2x 15mm Soundbloc Boards, use of 2x Fireline assessed as suitable

- Where heavy loads are to be hung from walls the inner layer may be replaced with 1x 12.5mm Habito, (Report no - P112827-1008, tested in to out only).

- Minimum 100mm Polterm Max Plus

### 2. 90 Minute Internal Wall

- 2 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 100mm Intrastack loadbearing steel frame
- 2 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)

**Note** - This build-up has no insulation


### 3. 90 Minute Party Wall

- 2 layers 15mm British Gypsum Gyproc SoundBloc F plasterboard (fireside)
- British Gypsum Gypframe Resilient Bar (RB1)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- British Gypsum Gypframe Resilient Bar (RB1)
- 2 layers 15mm British Gypsum Gyproc SoundBloc F plasterboard (non-fireside)

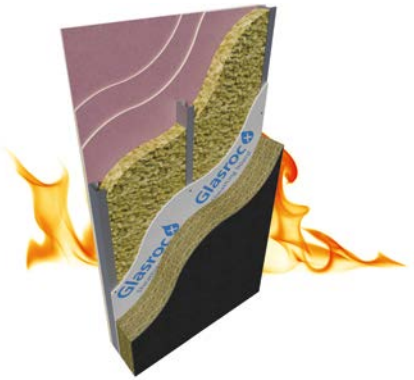
**Note** - Including socket openings on fire side

| Option | Name | Stud depth (min) | Tested in accordance with | Tested duration (mins) | Fire Test Ref. |
|---|---|---|---|---|---|
| 1 | 90 Minute External wall | 100mm | BS EN 1365-1:2012 | 90 | P112827-1001 & 1009 |
| 2 | 90 Minute Internal Wall | 100mm | BS EN 1365-1:2012 | 90 | T3 2023-Efectis-R001125 |
| 3 | 90 Minute Party Wall | 100mm | BS EN 1365-1:2012 | 90 | P125587-1000 |

# LOAD BEARING WALLS

## LOADED WALLS – 120MINS

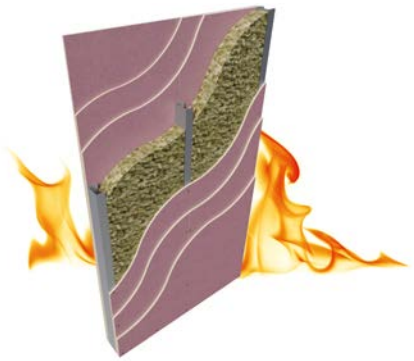
Fire performance
**120 minutes**
(tested to BS EN 1365-1:2012)




### 1. 120 Minute External Wall

- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 1 layer 12.5mm British Gypsum Glasroc X sheathing board (non-fireside)
- Isover Polterm Max Plus insulation (non-fireside)

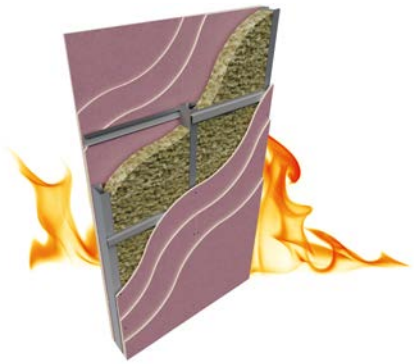
**Note** - Minimum 150mm Polterm Max Plus



### 2. 120 Minute Internal Wall

- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 100mm Intrastack loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard (non-fireside)

**Note** - Including socket openings on fire side



### 3. 120 Minute Party Wall

- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- British Gypsum Gypframe Resilient Bar (RB1)
- 100mm loadbearing steel frame
- 100mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- British Gypsum Gypframe Resilient Bar (RB1)
- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard (non-fireside)

**Note** - Including socket openings on fire side

| Option | Name | Stud depth (min) | Tested in accordance with | Fire Performance (mins) | Fire Test Ref. |
|---|---|---|---|---|---|
| 1 | 120 Minute External Wall | 100mm | BS EN 1365-1:2012 | 120 | P112827-1002 & BTC 23301F |
| 2 | 120 Minute Internal Wall | 100mm | BS EN 1365-1:2012 | 120 | BTC 20086726 |
| 3 | 120 Minute Party Wall | 100mm | BS EN 1365-1:2012 | 120 | BTC 2325F |

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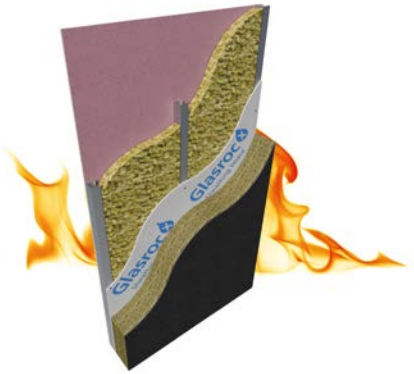
WALL BUILD-UP MATRIX

Fire performance
**30** & **60 minutes**
(tested to BS EN 1365-1:2012)

# LOW-RISE HOUSING

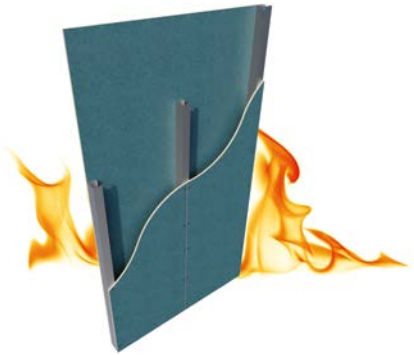
## LOADED WALLS – 30 & 60MINS (SUITABLE FOR LOW-RISE CONSTRUCTION)




### 1. 30 Minute External Wall

- 1 layer 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 70mm Intrastack loadbearing steel frame
- 65mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 1 layer 12.5mm British Gypsum Glasroc X sheathing board (non-fireside)
- 180mm Isover Polterm Max Plus insulation (non-fireside)

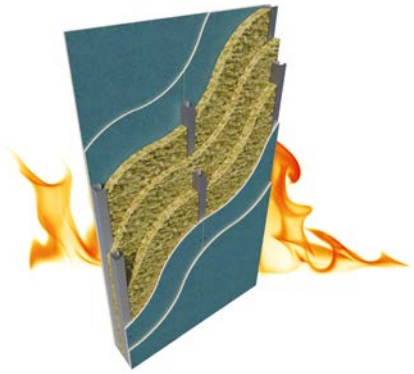
**Note** - Suitable for brick façade only



### 2. 30 Minute Internal Wall

- 1 layer 15mm British Gypsum Gyproc Soundbloc plasterboard (fireside)
- 70mm Intrastack loadbearing steel frame
- 1 layer 15mm British Gypsum Gyproc Soundbloc plasterboard (non-fireside)

**Note** - This build-up has no insulation



### 3. 60 Minute Twin Party Wall (low rise only)

- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (fireside)
- 70mm Intrastack loadbearing steel frame
- 65mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 50mm cavity filled with Isover Acoustic Partition Roll (APR 1200)
- 70mm Intrastack loadbearing steel frame
- 65mm Isover Acoustic Partition Roll (APR 1200) in stud zone
- 2 layers 15mm British Gypsum Gyproc SoundBloc plasterboard (non-fireside)

| Option | Name | Stud depth (min) | Tested in accordance with | Tested duration (mins) | Fire Test Ref. |
|---|---|---|---|---|---|
| 1 | Fireline & Glasroc X | 70mm | BS EN 1363-1:2020 and BS EN 1365-1:2012 | 30 | Efectis EUI-22-000089-A |
| 2 | SoundBloc | 70mm | BS EN 1363-1:2020 and BS EN 1365-1:2012 | 30 | P120502-1012 |
| 3 | SoundBloc | 70mm | BS EN 1363-1:2020 and BS EN 1365-1:2012 | 60 | Efectis EUI-22-000090-B |

INTRASTACK

# JOISTED CONSTRUCTION

## LOAD BEARING FLOOR / ROOF – 30, 60 & 90MINS

Fire performance
**30, 60** & **90 minutes**
(tested to BS EN 1365-1:2014)

### 1. 30 Minute Joisted Floor / Roof

- 1 layer 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- 200mm Intrastack steel joists
- 50mm Isover Acoustic Partition Roll (APR 1200) in joist zone
- 1 layer 22mm CaberDek on the unexposed side

### 2. 60 Minute Joisted Floor / Roof

- 2 layers 15mm British Gypsum Gyproc Fireline plasterboard (fireside)
- British Gypsum Gypframe Resilient Bar (RB1)
- 200mm Intrastack steel joists
- 50mm Isover Acoustic Partition Roll (APR 1200) in joist zone
- 1 layer 22mm CaberDek on the unexposed side

### 3. 90 Minute Joisted Floor / Roof

- 3 layers 15mm British Gypsum Gyproc Fireline plasterboard
- British Gypsum Gypframe Resilient Bar (RB1)
- 200mm Intrastack steel joists
- 50mm Isover Acoustic Partition Roll (APR 1200) in joist zone
- 1 layer 18mm CaberDek on the unexposed side

### Note – Concrete Construction

For composite concrete floors, fire performance is determined by calculation. Differing quantities of reinforcement bar is installed depending on requirement.

| Option | Name | Stud depth (min) | Tested in accordance with | Tested duration (mins) | Fire Test Ref. |
|---|---|---|---|---|---|
| 1 | Fireline | 200mm | BS EN 1363-1:2020 and BS EN 1365-2:2014 | 30 | Efectis EUI-22-000091-A |
| 2 | Fireline | 200mm | BS EN 1363-1:2020 and BS EN 1365-2:2014 | 60 | Efectis EUI-22-000091-B |
| 3 | Fireline | 200mm | BS EN 1363-1:2020 and BS EN 1365-2:2014 | 90 | P120502-1017 |

# U-VALUE TABLE

## ACHIEVED VALUES

| **Polterm thickness** (mm) | **Internal board** | **Insulation within stud cavity**** | **U-value achieved** ($W/m^2K$) |
|---|---|---|---|
| 100 | 2x 12.5mm Fireline | APR 1200 | 0.19 |
| 150 | 2x 12.5mm Fireline | APR 1200 | 0.15 |
| 200 | 2x 12.5mm Fireline | APR 1200 | 0.13 |
| 100 | 2x 15mm Fireline | APR 1200 | 0.19 |
| 150 | 2x 15mm Fireline | APR 1200 | 0.15 |
| 200 | 2x 15mm Fireline | APR 1200 | 0.13 |
| 100 | 3x 15mm Fireline | APR 1200 | 0.19 |
| 150 | 3x 15mm Fireline | APR 1200 | 0.15 |
| 200 | 3x 15mm Fireline | APR 1200 | 0.12 |
| 100 | 2x 15mm Soundbloc | APR 1200 | 0.19 |
| 150 | 2x 15mm Soundbloc | APR 1200 | 0.15 |
| 200 | 2x 15mm Soundbloc | APR 1200 | 0.13 |
| 100 | 1x 12.5mm Habito 1x 15mm Fireline | APR 1200 | 0.19 |
| 150 | 1x 12.5mm Habito 1x 15mm Fireline | APR 1200 | 0.15 |
| 200 | 1x 12.5mm Habito 1x 15mm Fireline | APR 1200 | 0.13 |

**What is a U-value?**

A U-value (given in $W/m^2K$) is the rate of transfer of heat through a structure divided by the difference in temperature across the structure. It is a method of calculating **thermal transmittance**.

The U-value of a wall is affected by the materials used in its construction. This table gives an indication of values but please contact us for a project specific calculation.

PSI Values

Intrastack can provide PSI values based on specific project details, for a fee.

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Disclaimer:

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Typically, Isover Steel Frame Infill Batt would be specified for these applications, rather than APR1200. A 1.2mm gauge SFS has been assumed, no plaster skim has been included. Please note: the indicative U-value calculations are to be used as part of a whole wall calculation, following the component assessment method. These do not account for any junction detailing, structural variations or other items which may cause significant thermal bridging issues. The final wall U-value will depend on the integration of this system into the frame of the building. If the design has not yet been finalised, nor the size or gauge of steel frame specified, please bear in mind the impact of the two details upon the potential width of wall construction.

Fire testing provides an indication of the performance of the tested wall construction, the data within this brochure is provided to inform the complete building design carried out by the principle designer / qualified fire engineer.

INTRA STACK

V1.0