RESISTANT
BUILDING PRODUCTS LTD

PASSIVE FIRE PROTECTION GUIDE

THE ESSENTIAL HANDBOOK FROM RESISTANT BUILDING PRODUCTS FOR SPECIFYING APPROVED AND TESTED FIRE RATED SOLUTIONS.

INDUSTRY LEADING PASSIVE FIRE PROTECTION SOLUTIONS BY RESISTANT BUILDING PRODUCTS.

THIS GUIDEBOOK CONTAINS A RANGE OF FULLY ACCREDITED & CERTIFIED TESTS CARRIED OUT BY THE INDUSTRY EXPERTS IN FIRE TESTING FOR CONSTRUCTION PRODUCTS.

Exova

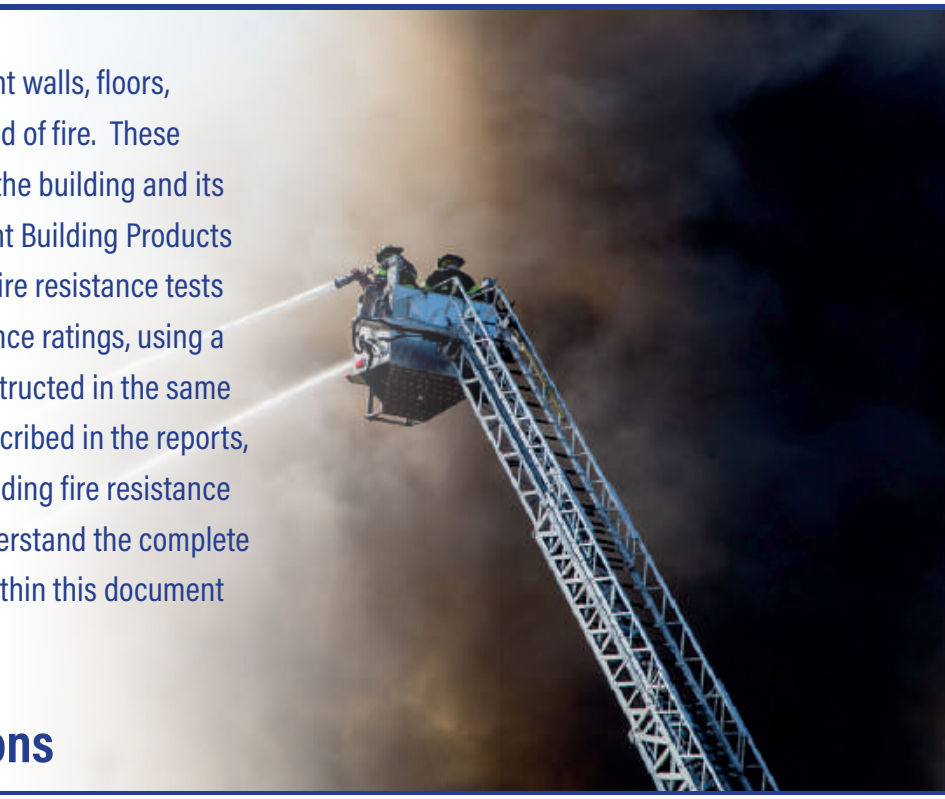
Efectis

bre

CONTENTS

Principles of Passive Fire Protection

Passive fire protection is the use of fire resistant walls, floors, ceilings and doors to contain or slow the spread of fire. These methods are integral to maintain the safety of the building and its occupants when works are complete. Resistant Building Products have carried out a number of wall and ceiling fire resistance tests and assessments to achieve various performance ratings, using a range of products. If the wall or ceiling is constructed in the same manner using the same materials as those described in the reports, it should be expected to achieve the corresponding fire resistance rating. The reports **must** be referenced to understand the complete build-up of the system, the diagrams shown within this document are for summary purposes only.



Fire Resistance Classifications

CLASSIFICATION	DEFINITION	DESCRIPTION
A1	Non-Combustible	No contribution to fire
A2	Limited Combustibility	Very limited contribution to fire
B	Combustible	Limited contribution to fire
C	Combustible	Minor contribution to fire
D	Combustible	Medium contribution to fire
E	Combustible	High contribution to fire
F	Combustible	Easily flammable

The BS EN 13501-1 classification is a Euroclass rating, which will be the letter A1, A2, B, C, D, E or F. A1 is the highest level of performance, while F is the lowest level. *Resistant Building Products range of Magnesium Oxide & Fibre Cement boards are rated as A1 non-combustible, which denotes the highest possible performance.*

Fire Testing Standards & Performance

Resistant Building Products' fire tests have been carried out to British and European standards for varying applications using the testing standards shown. The pass/fail criteria for the fire resistance tests is based on three things:

Load bearing Capacity: Ability of the test structure to support its load without deforming or failing.

Integrity: Ability of test structure to resist cracking or sustained flaming on the unexposed face.

Insulation: Ability of a test structure to prevent the temperature of the unexposed face exceeding a specified level.

General

TEST STANDARD	APPLICATION
BS EN 1363-1	Fire resistance tests, general requirements
BS EN 1363-2	Fire resistance tests, alternative and additional procedures
BS EN 1363-3	Verification of furnace performance

Non load-bearing

TEST STANDARD	APPLICATION
BS EN 1364-1	Walls
BS EN 1364-2	Ceilings

Load-bearing

TEST STANDARD	APPLICATION
BS EN 1365-1	Walls
BS EN 1365-2	Ceilings
BS 476 Part 21	Fire resistance of loadbearing elements of construction

About Resistant

Resistant Building Products are committed to providing high performing boards which suit a range of applications requiring certified fire protection. With a strenuous quality assurance process, as audited by the British Board of Agrément, Resistant can guarantee that boards of impeccable standard are produced every time. Resistant have been awarded STA Gold accreditation for maintaining these high standards of manufacture, production and service. As well as offering a range of BBA certified products, Resistant are also founding members of the Magnesium Oxide Board Trading Association (MOBBTA), which is working to support the wider construction industry in ensuring good practice and appropriate use of the boards.

SOME OF OUR NOTABLE ACCREDITATIONS INCLUDE:

STA ASSUREGOLD

STRUCTURAL TIMBER ASSOCIATION *Member*

F·T·M·R·C

MOBBTA Magnesium Oxide Building Board Trading Association

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 15/5255

Product Range

Resistant Building Products have developed a diverse range of boards to suit varying requirements. With both Magnesium Oxide & Fibre Cement boards on offer, we provide a wealth of robust, durable solutions to suit any project needs. Please refer to www.resistant.co.uk for further details on our full range.

Below are the boards from Resistant's collection of products which have been certified and tested for use as fire rated wall partitions or ceiling panels, **please refer to the test certificates for full details.**

UP TO 60 MINUTES — 20-20 Fibre Cement Board *THIS BOARD IS NOT INCLUDED WITHIN THE SCOPE OF OUR BBA CERT*

UP TO 120 MINUTES — multi-proXS

UP TO 90 MINUTES — multi-pro

UP TO 60 MINUTES — BASE BOARD *THIS BOARD IS NOT INCLUDED WITHIN THE SCOPE OF OUR BBA CERT*

Fire Resistant Partitions & External Walls

Passive Fire Protection is the use of 'designed-in' fire protection methods to control and slow the spread of fire. Fire resistant walls assist with the compartmentation of fires within buildings, safeguarding the occupants in adjacent rooms/areas. Walls not meeting the required fire rating will fail and subsequently increase the risk factor and danger to human life and property. Resistant Building Products fire walls & ceilings have passed insulation, integrity and loading criteria to meet required standards ranging from 30 to 120 minutes fire resistance. The choice of construction methods and materials will be dependant on your project requirements. Our technical team can provide detailed fire test reports and guidance to help ensure you always select and fit Resistant's range of building boards in thoroughly proven solutions.

Introduction to Timber Frame

Why does Resistant test using Timber Frame?

Timber frame construction provides an efficient, convenient and cost-effective alternative to traditional construction methods using brick and block. The popularity and increased use of timber frame in housing development & other projects is linked to the benefits of off-site construction.

Modern timber frame structures are precision engineered, robust and durable, with the build method relying on factory produced timber frame as a means of structural support. Around a quarter of all new homes built in the UK have utilised this method of construction using pre-fabricated wall panels, floors & roof panels.

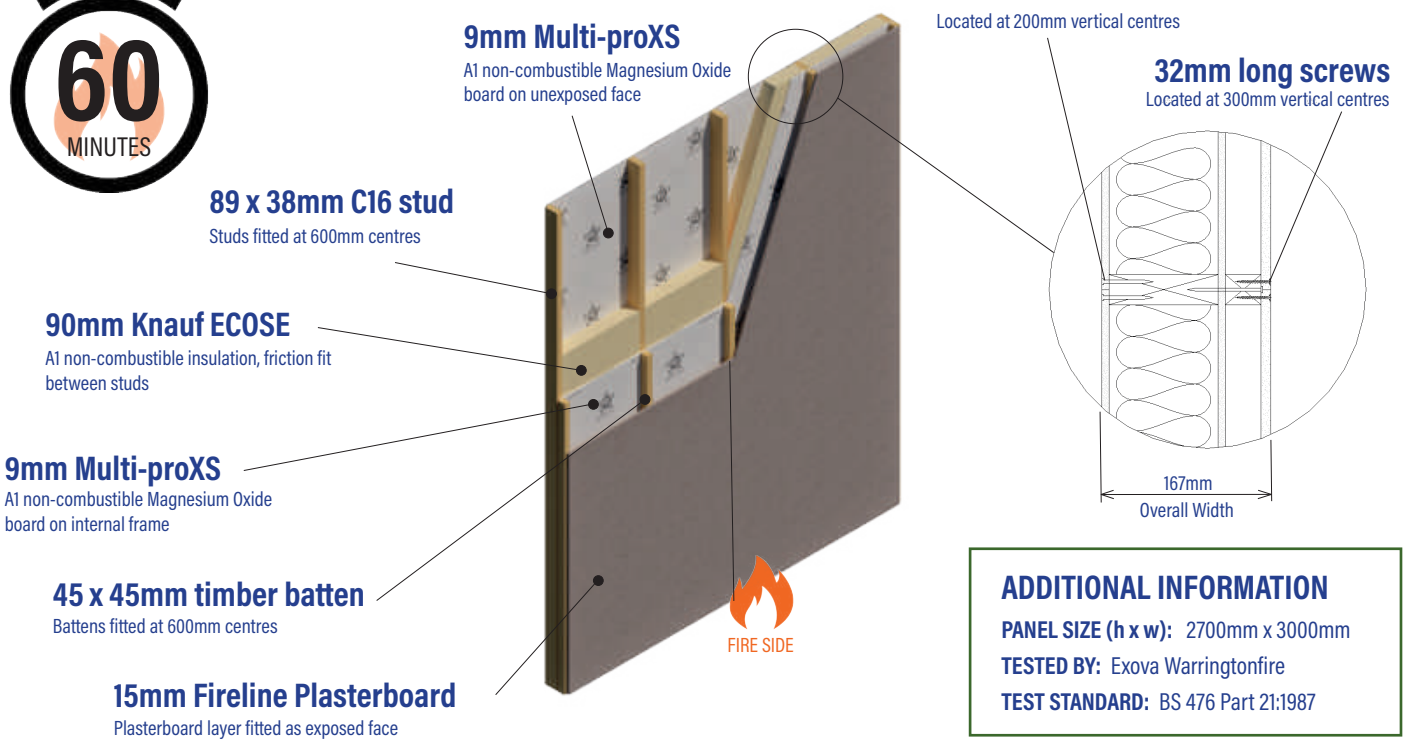
The following section outlines the various timber frame structures which Resistant Building Products have tested to provide between 60 to 120 minutes fire resistance.

LOAD BEARING WALL

REF: 004_9XS_TI_LB_WALL_60MIN

TIMBER FRAME

60 MINUTES



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 2700mm x 3000mm
TESTED BY: Exova Warringtonfire
TEST STANDARD: BS 476 Part 21:1987

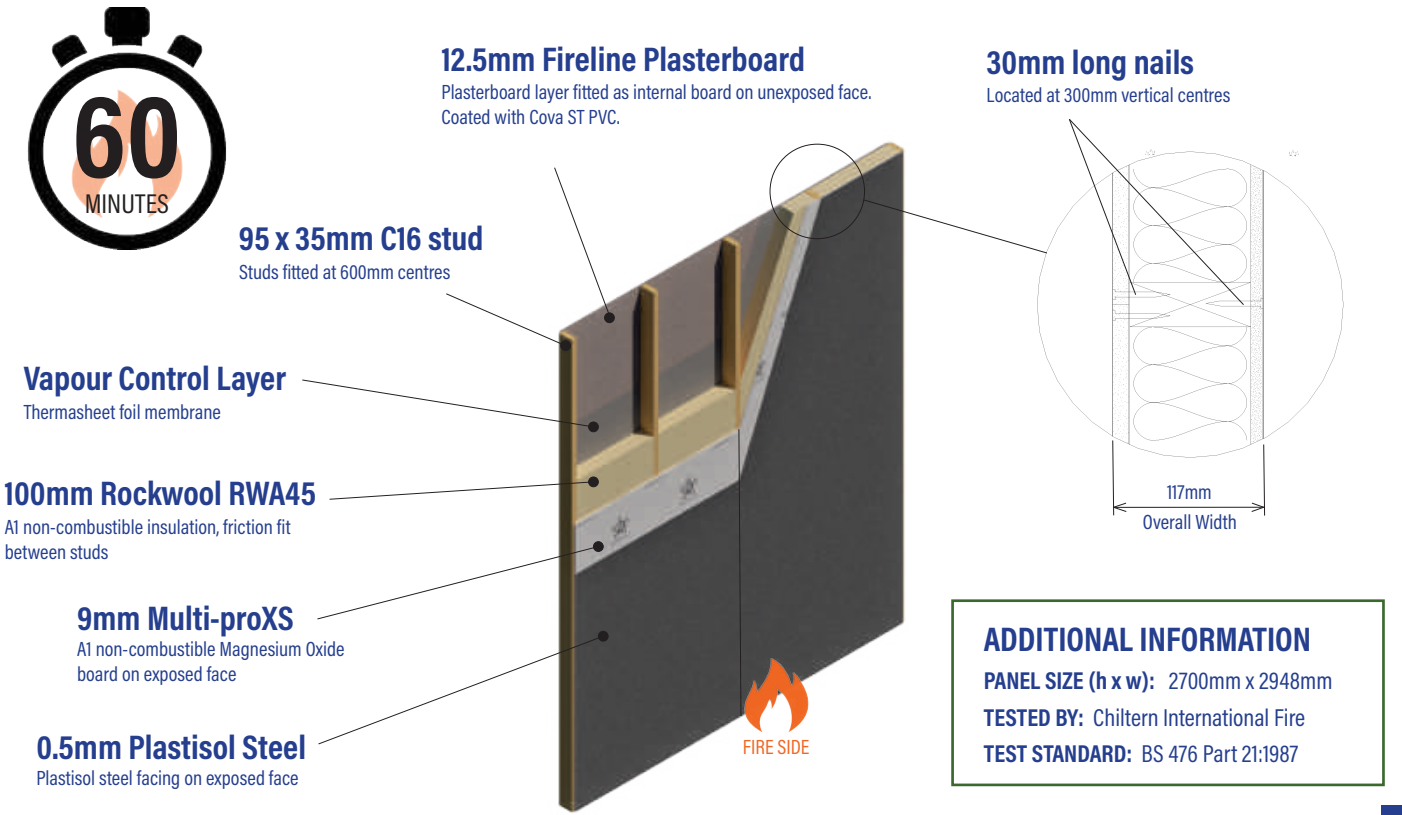
Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

LOAD BEARING WALL

REF: 002_9XS_TI_LB_WALL_60MIN

TIMBER FRAME

60 MINUTES



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 2700mm x 2948mm
TESTED BY: Chiltern International Fire
TEST STANDARD: BS 476 Part 21:1987

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

LOAD BEARING WALL

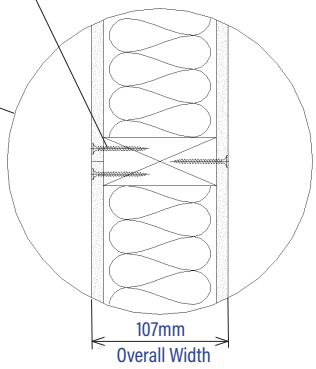
REF: 001_9XS_TI_LB_WALL_60MIN

TIMBER FRAME

60 MINUTES

9mm Multi-proXS
A1 non-combustible Magnesium Oxide board on unexposed face

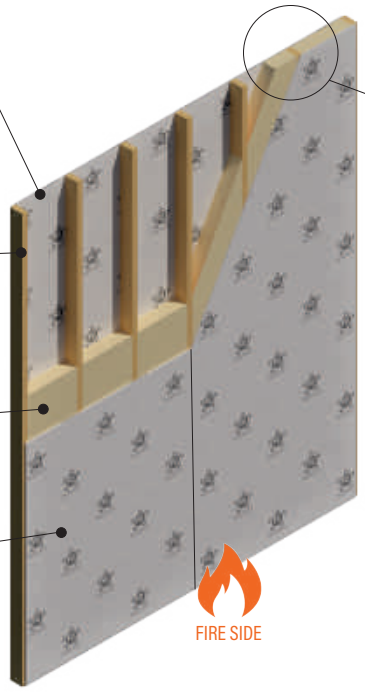
3.5mm x 50mm drywall screws
Located at 150mm vertical centres



89 x 38mm C16 stud
Studs fitted at 400mm centres, noggins placed mid-height of frame

100mm Rockwool RollBatt
A1 non-combustible insulation, friction fit between studs

9mm Multi-proXS
A1 non-combustible Magnesium Oxide board on exposed face



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 2700mm x 3000mm
TESTED BY: Exova Warringtonfire
TEST STANDARD: BS 476 Part 21:1987

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

LOAD BEARING WALL

003_9XS_TI_LB_WALL_90MIN

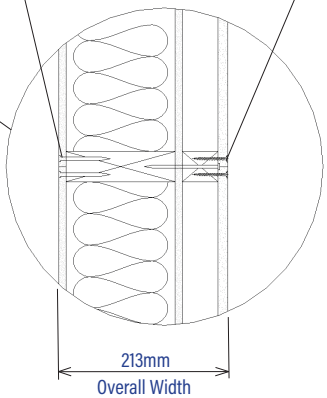
TIMBER FRAME

90 MINUTES

2.5mm x 50mm nails
Located at 200mm vertical centres

32mm long screws
Located at 300mm vertical centres

9mm Multi-proXS
A1 non-combustible Magnesium Oxide board on unexposed face



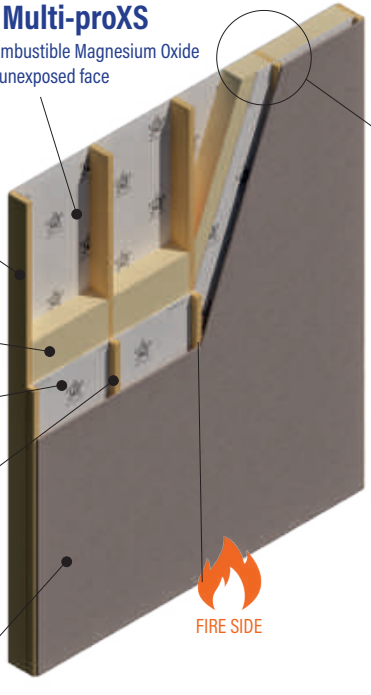
138 x 38mm C16 stud
Studs fitted at 600mm centres

140mm Knauf ECOSE
A1 non-combustible insulation, friction fit between studs

9mm Multi-proXS
A1 non-combustible Magnesium Oxide board on internal frame

45 x 45mm timber batten
Battens fitted at 600mm centres

12.5mm Fireline Plasterboard
Plasterboard layer fitted as exposed face



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 2700mm x 3000mm
TESTED BY: Chiltern International Fire
TEST STANDARD: BS 476 Part 21:1987

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

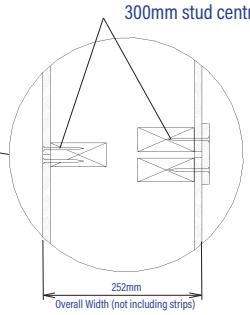
REF: 010_12MP_TI_NLB_SPAN_60MIN

TIMBER FRAME

60 MINUTES

12mm Multi-pro
A1 non-combustible Magnesium Oxide board on unexposed face

2.9mm x 50mm nails
Located at 150mm perimeter centres & 300mm stud centres

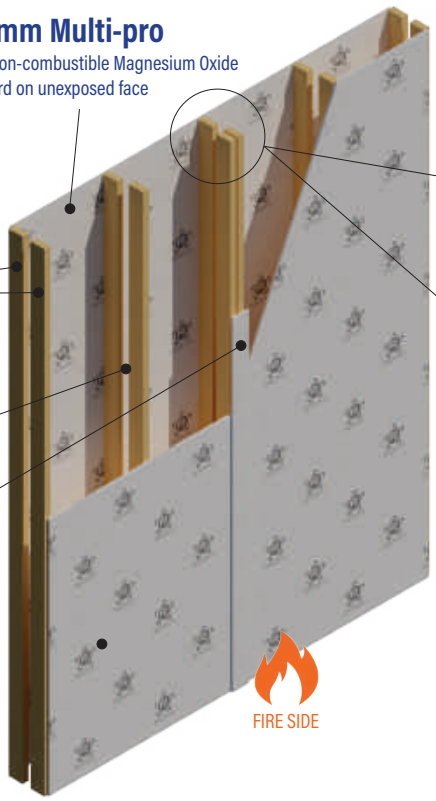


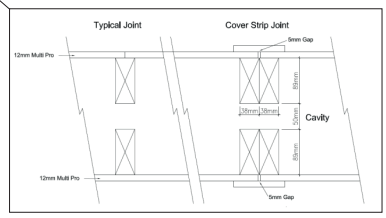
2no. 38 x 89mm C16 timber stud frames
Studs fitted at 600mm centres, noggins placed mid-height of frame

50mm Air gap
Air gap between frames of spandrel panel

12mm Multi-pro strip
100mm wide cover strip representing where frames butt together

12mm Multi-pro
A1 non-combustible Magnesium Oxide board on exposed face





ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1363-1:2012 and BS EN 1364-1: 2015

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

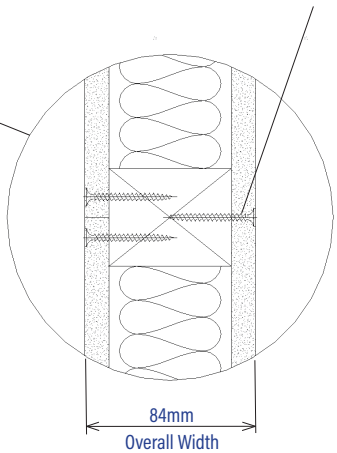
REF: 005_12XS_TI_NLB_WALL_120MIN

TIMBER FRAME

120 MINUTES

12mm Multi-proXS
A1 non-combustible Magnesium Oxide board on unexposed face

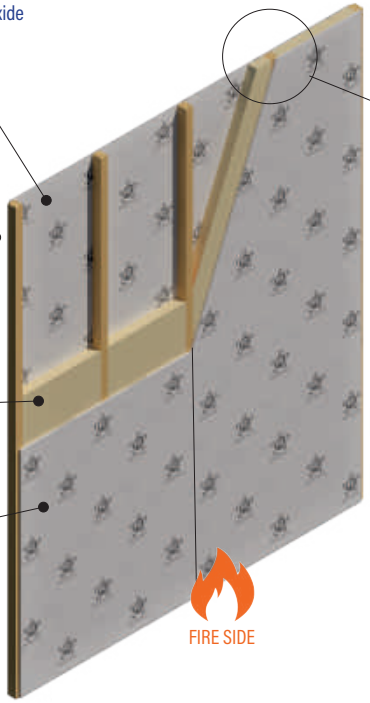
3.5mm x 38mm drywall screws
Located at 300mm vertical centres



60 x 48mm C16 stud
Studs fitted at 600mm centres, noggins placed mid-height of frame

60mm Rocksilk Slab
2 No. layers of 30mm thick A1 non-combustible insulation slabs, friction fit between studs

12mm Multi-proXS
A1 non-combustible Magnesium Oxide board on exposed face



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Exova Warringtonfire
TEST STANDARD: BS EN 1364-1:1999

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

Introduction to Steel Frame

Why does Resistant test using Steel Frame?

Steel frame can be used in load bearing and non-load bearing construction applications in a variety of sectors including industrial, commercial and social. Steel tends to be used in larger scale buildings due to its cost, light weight and high strength for loaded structural applications.

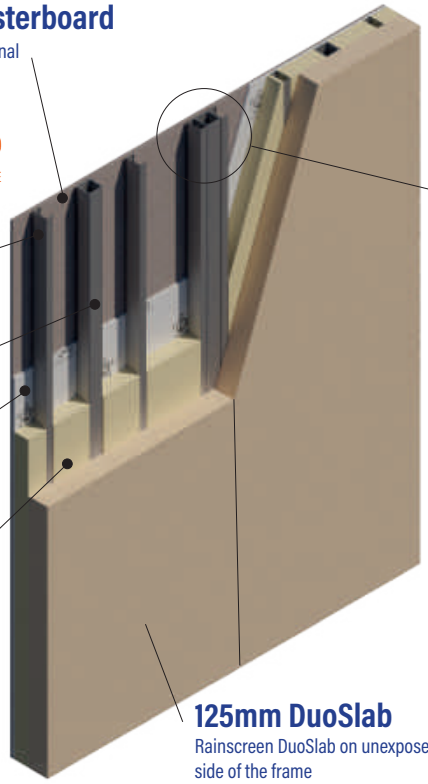
Resistant have worked with leading steel frame manufacturers to develop a series of tests suited to various internal and external wall constructions ranging across multiple sectors.

The following section outlines the various steel frame structures which Resistant Building Products have tested to provide between 60 to 120 minutes fire resistance.

LOAD BEARING WALL

REF: 011_12MP_ST_LB_WALL_90MIN

STEEL FRAME



15mm Fireline Plasterboard
Plasterboard layer fitted as internal board on exposed face

89 x 45 x 1.2mm C section
Studs fitted at 400mm centres - for further info. on frame, see report

90 x 90 x 6.3mm SHS
Structural steel studs - for further info. on frame, see report

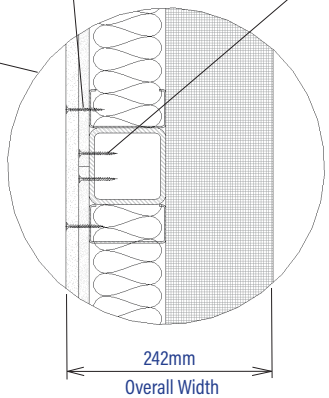
12mm Multi-pro
A1 non-combustible Magnesium Oxide board

100mm Rockwool RollBatt
A1 non-combustible insulation, friction fit between studs

125mm DuoSlab
Rainscreen DuoSlab on unexposed side of the frame

3.5mm x 55mm screws
Located at 300mm vertical centres

5.5mm x 50mm screws
Located at 300mm vertical centres



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1363-1:2012 and BS EN 1365-1: 2012

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 015_12XS_ST_NLB_WALL_120MIN

STEEL FRAME

120 MINUTES

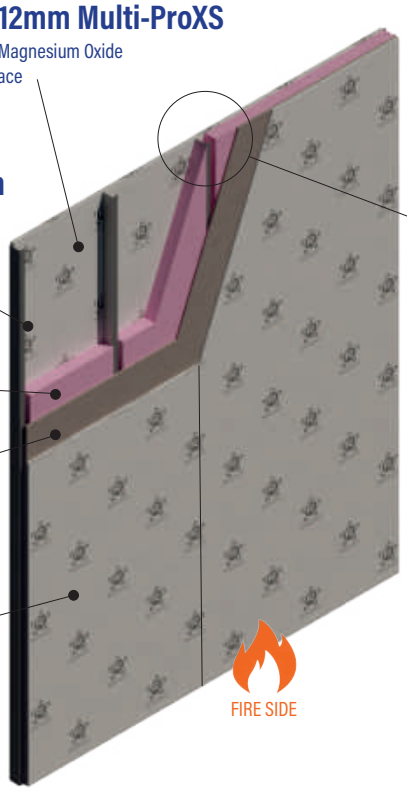
2No. layers 12mm Multi-ProXS
A1 non-combustible Magnesium Oxide boards on exposed face

70 x 50 x 0.7mm C section
Studs fitted at 600mm centres

Cellulose Fibre Insulation
Insulation pumped to fill cavity between studs

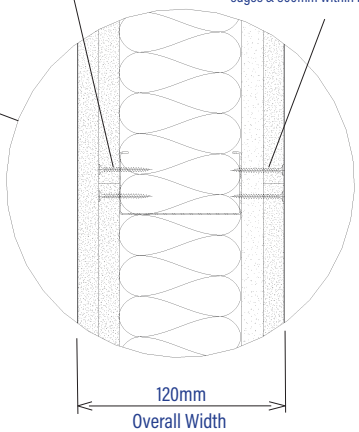
12.5mm Type A Plasterboard
Plasterboard layer fitted as internal board on exposed face

12mm Multi-ProXS
A1 non-combustible Magnesium Oxide board as external layer on exposed face



Internal Layers
3.5mm x 32mm screws
Located at 600mm centres

External Layers
3.5mm x 38mm screws
Located at 200mm on perimeter vertical edges & 300mm within board field



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1363-1:2012 and BS EN 1364-1: 2015

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 009_12BB_ST_NLB_WALL_60MIN

STEEL FRAME

60 MINUTES

12mm Base Board
A1 non-combustible Magnesium Oxide board on unexposed face

90 x 48 x 1.2mm C section
Studs fitted at 600mm centres, noggins placed mid-height of frame

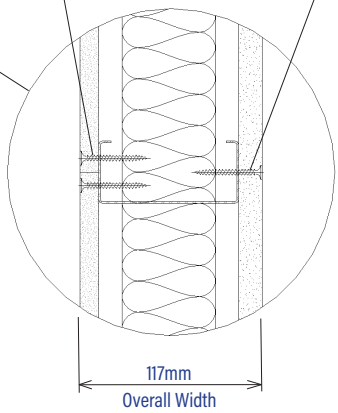
60mm Rockwool RWA45
2 No. layers of 30mm thick A1 non-combustible insulation slabs, friction fit between studs

Vapour Control Layer
Tyvek Housewrap behind plasterboard

15mm Fireline Plasterboard
Tapered Edge Plasterboard layer fitted as exposed face

4.8mm x 38 mm screws
Located at 300mm vertical centres

3.5mm x 25mm screws
Located at 300mm vertical centres



ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1363-1:2012 and BS EN 1364-1: 2015

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 006_12XS_ST_NLB_WALL_60MIN

STEEL FRAME

60 MINUTES

12mm Multi-proXS
A1 non-combustible Magnesium Oxide board on unexposed face

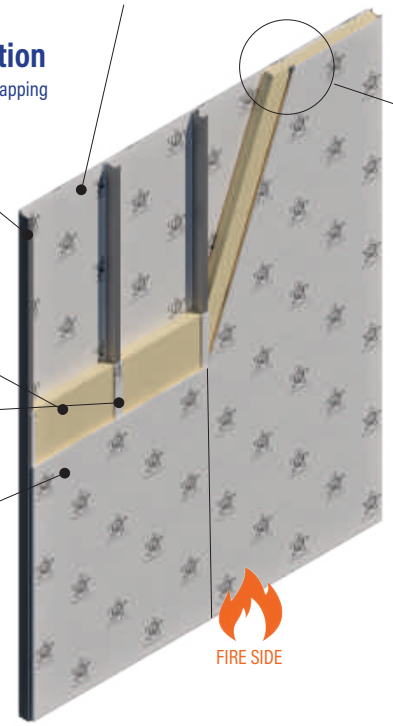
3.5mm x 38mm drywall screws
Located at 300mm vertical centres

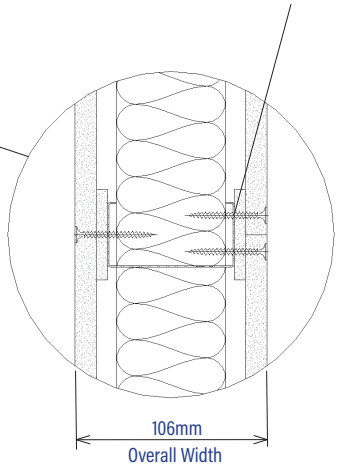
70 x 36 x 0.5mm C section
Studs fitted at 600mm centres, with strapping across board joints

60mm Rocksilk Slab
2 No. layers of 30mm thick A1 non-combustible insulation slabs, friction fit between studs

6mm Multi-proXS
Strips fitted along studs as added protection

12mm Multi-proXS
A1 non-combustible Magnesium Oxide board on exposed face





ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Exova Warringtonfire
TEST STANDARD: BS EN 1364-1:1999

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 008_12BB_ST_NLB_WALL_60MIN

STEEL FRAME

60 MINUTES

15mm Type F Plasterboard
Plasterboard layer fitted as unexposed face

3.5mm x 25mm screws
Located at 300mm vertical centres

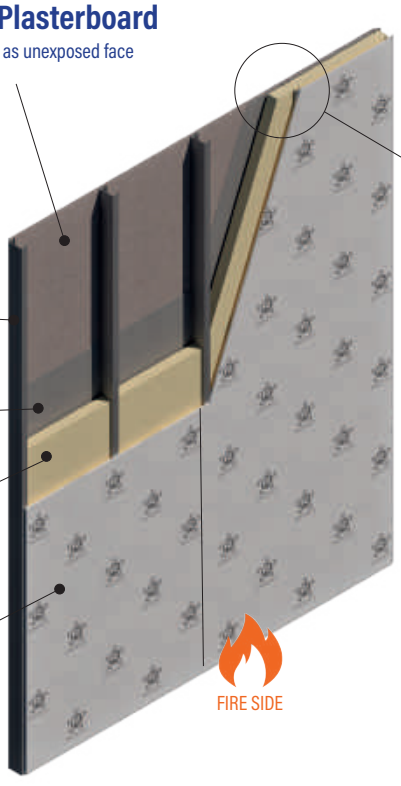
4.8mm x 38mm screws
Located at 300mm vertical centres

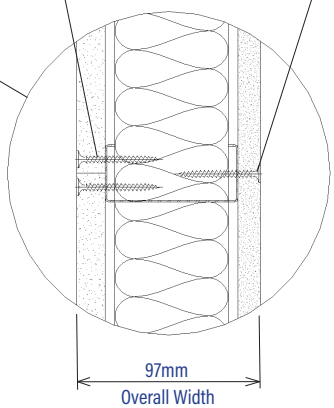
70 x 30 x 0.55mm C section
Studs fitted at 600mm centres

Vapour Control Layer
Tyvek Housewrap

60mm Rockwool RWA45
2 No. layers of 30mm thick A1 non-combustible insulation slabs, friction fit between studs

12mm Base Board
A1 non-combustible Magnesium Oxide on exposed face





ADDITIONAL INFORMATION

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Exova Warringtonfire
TEST STANDARD: BS EN 1364-1:2015

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 016_9FCB_ST_NLB_WALL_60MIN
REF: 017_9FCB_ST_NLB_WALL_60MIN

STEEL FRAME

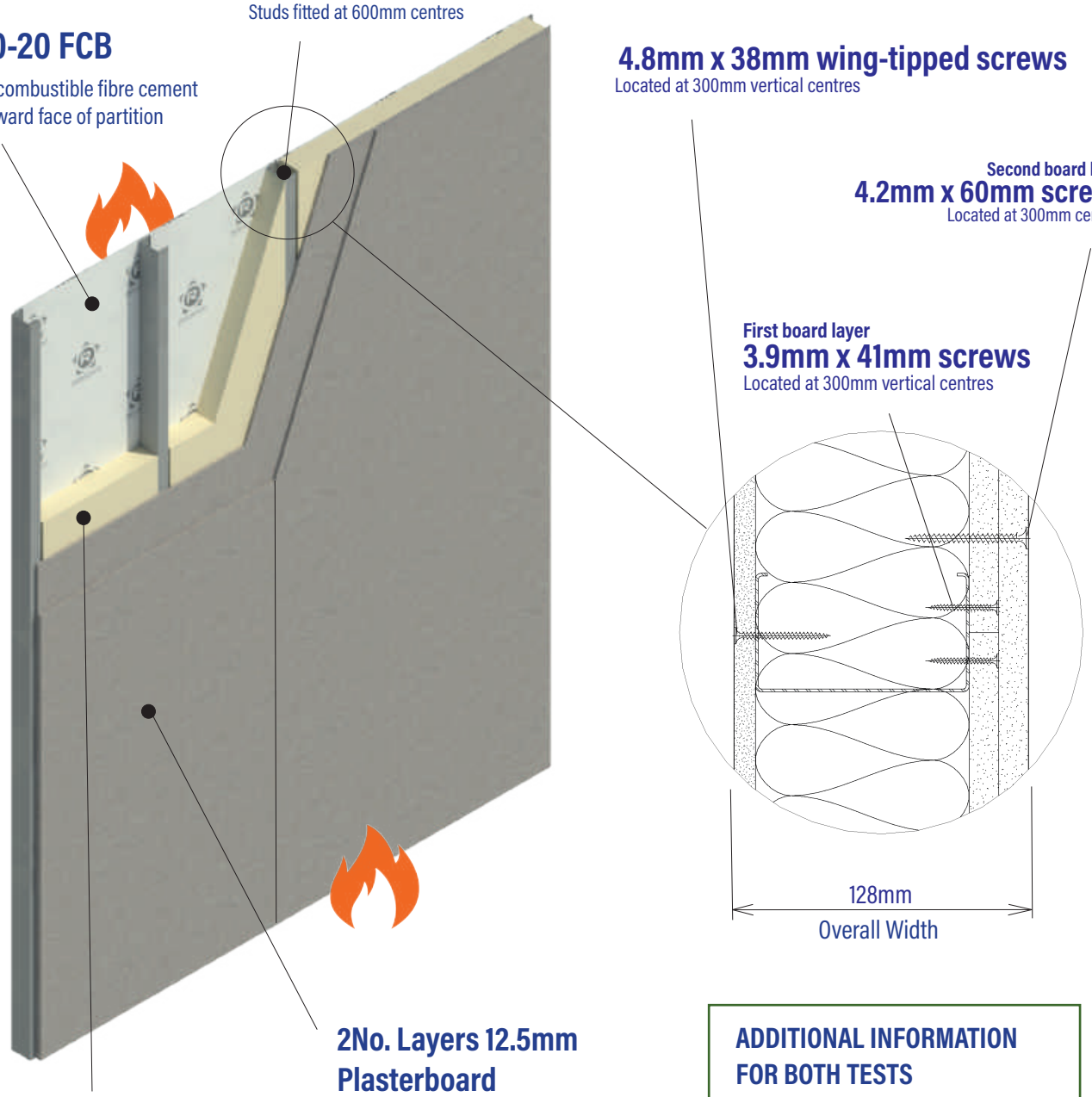
90 x 50 x 1.2mm C section
Studs fitted at 600mm centres

9mm 20-20 FCB
9mm A1 non-combustible fibre cement board on outward face of partition

4.8mm x 38mm wing-tipped screws
Located at 300mm vertical centres

Second board layer
4.2mm x 60mm screws
Located at 300mm centres

First board layer
3.9mm x 41mm screws
Located at 300mm vertical centres



2No. Layers 12.5mm Plasterboard

100mm Rockwool RWA45
A1 non-combustible insulation, friction fit between studs

ADDITIONAL INFORMATION FOR BOTH TESTS

PANEL SIZE (h x w): 3000mm x 3000mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1363-1:2012 and BS EN 1364-1: 2015

20-20 Fibre Cement Board

60 MINUTES

FIRE RESISTANCE IN BOTH DIRECTIONS!

OUT ⟷ IN

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

NON-LOAD BEARING WALL

REF: 018_9FCB_ST_NLB_WALL_90MIN
REF: 019_9FCB_ST_NLB_WALL_90MIN

STEEL FRAME

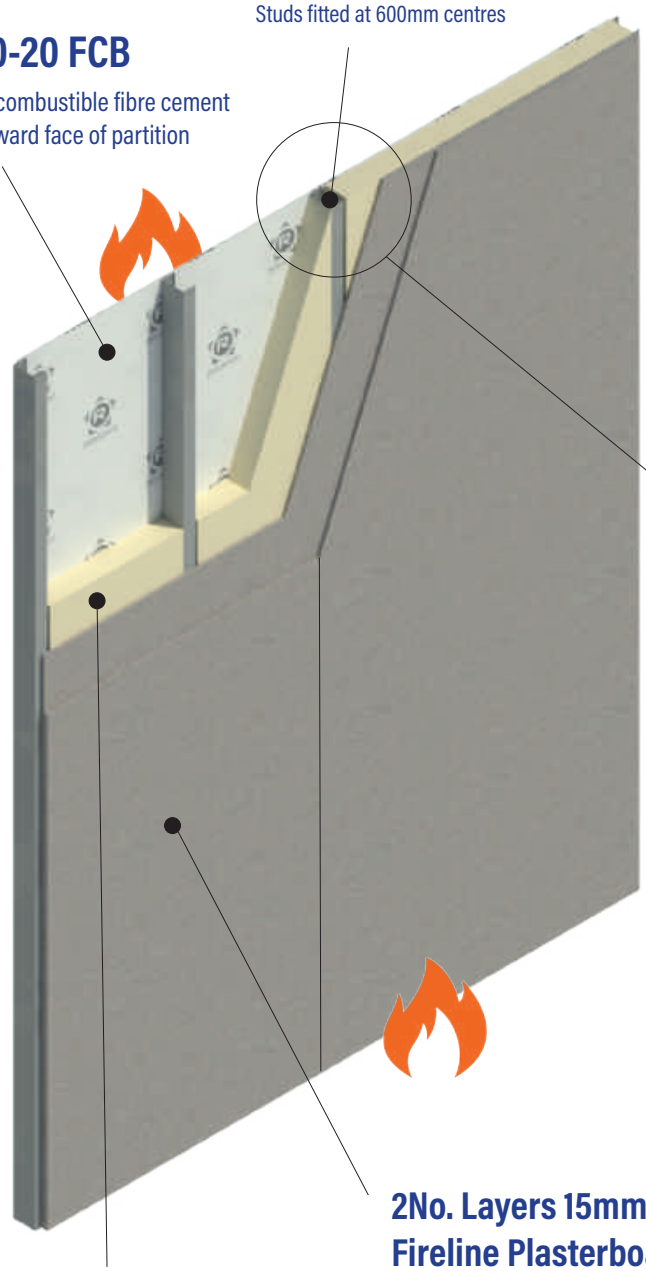
89 x 50 x 1.2mm C section
Studs fitted at 600mm centres

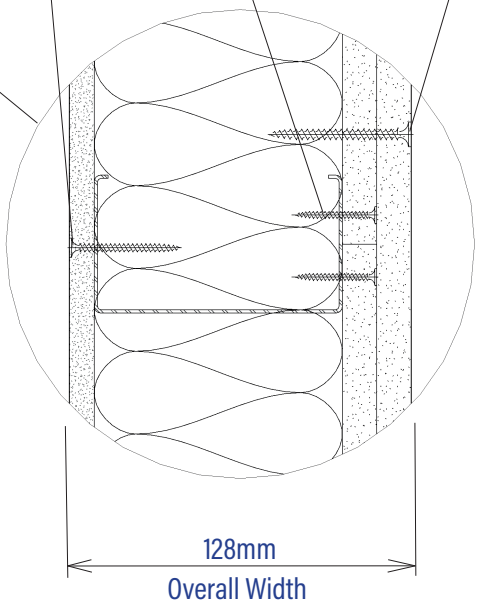
9mm 20-20 FCB
9mm A1 non-combustible fibre cement board on outward face of partition

4.2mm x 38mm Sympafix SDC-C-W-ZP4,2x38 screws
Located at 300mm centres

Second board layer
3.5mm x 38mm screws
Countersunk drywall screws located at 300mm centres

First board layer
3.5mm x 25mm screws
Countersunk drywall screws located at 600mm centres





2No. Layers 15mm Fireline Plasterboard

100mm Rockwool RWA45
A1 non-combustible insulation, friction fit between studs

ADDITIONAL INFORMATION FOR BOTH TESTS

PANEL SIZE (h x w): 2975mm x 3000mm
TESTED BY: Cambridge Fire Resaerch
TEST STANDARD: BS EN 1364-1:2015

90 MINUTES

FIRE RESISTANCE IN BOTH DIRECTIONS!

OUT ⟷ IN

20-20 Fibre Cement Board

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

Fire Resistant Ceilings & Floors

A vital element in the construction phase is incorporating passive ceilings & floor constructions into the fabric of the building to ensure safety-of-life if there was a serious fire.

Resistant have embarked on the process of developing high strength, high performance fire resistant ceiling/floor constructions for use in residential and non-residential applications.

The following section outlines the various timber frame ceiling/floor structures which Resistant Building Products have tested to provide between 30 to 90 minutes fire resistance.

LOAD BEARING CEILING

REF: 012_12MP_TI_LB_CEIL_90MIN

TIMBER FRAME

90 MINUTES

ADDITIONAL INFORMATION

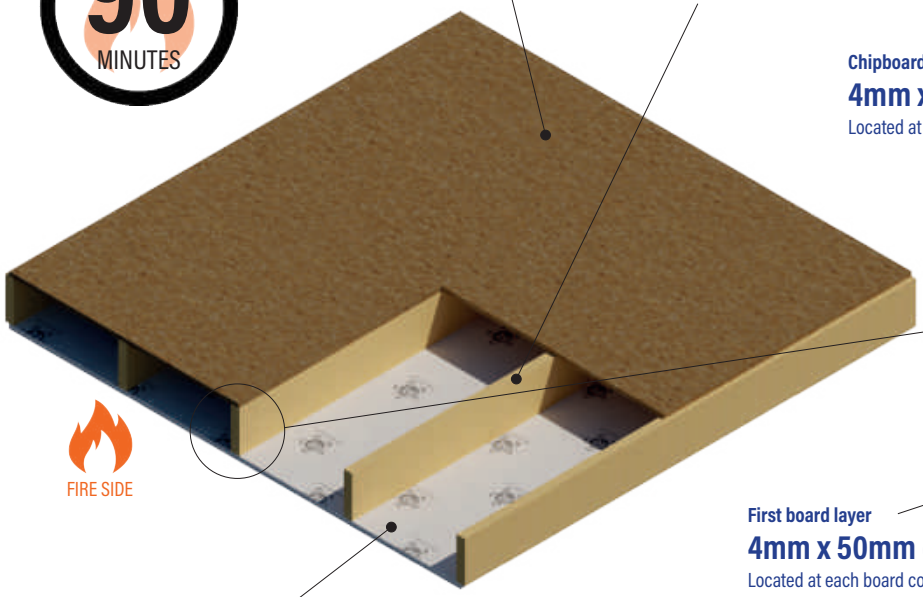
TEST PANEL: 3000 x 4500mm

TESTED BY: Exova Warringtonfire

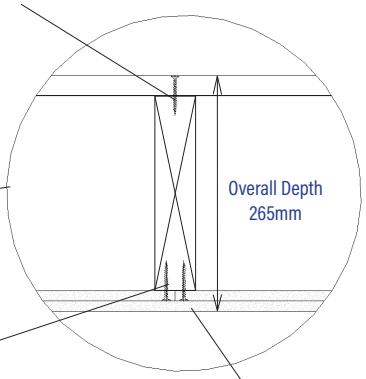
TEST STANDARD: BS EN 1365-2:2014

22mm T&G chipboard
Structural decking on unexposed face

219mm x 45mm C24 joist
Joists fitted at 600mm centres, noggins placed mid-length of frame



Chipboard layer
4mm x 70mm drywall screws
Located at 300mm centres



First board layer
4mm x 50mm drywall screws
Located at each board corner

Second board layer
4mm x 70mm drywall screws
Located at 300mm centres

2no. layers 12mm Multi-pro
A1 non-combustible Magnesium Oxide board on exposed face

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

LOAD BEARING CEILING

REF: 013_12MP_TI_LB_CEIL_30MIN

TIMBER FRAME

30 MINUTES

ADDITIONAL INFORMATION

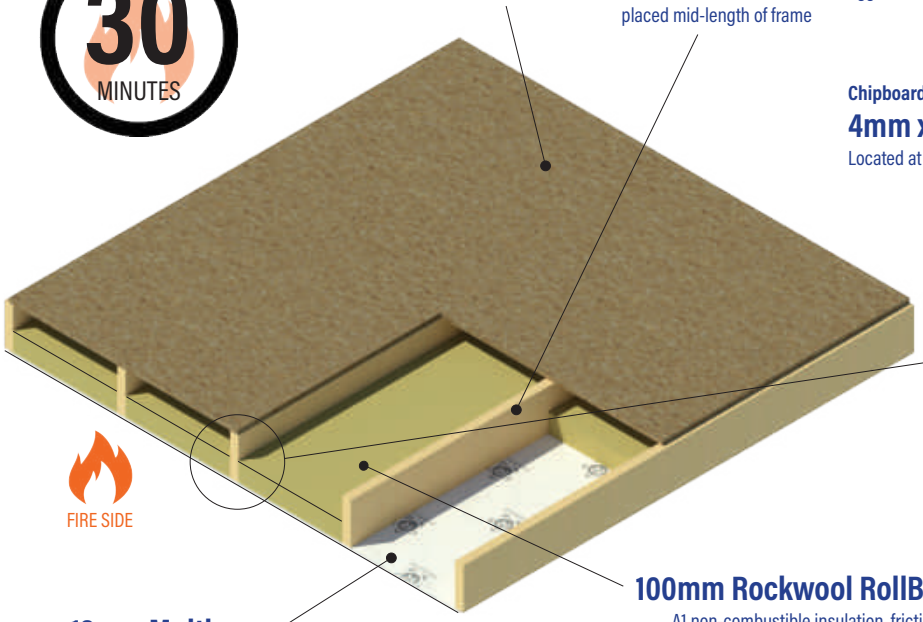
TEST PANEL: 3000 x 4500mm

TESTED BY: Exova Warringtonfire

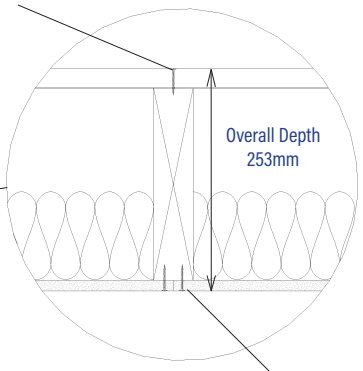
TEST STANDARD: BS EN 1365-2:2014

22mm T&G chipboard
Structural decking on unexposed face

219mm x 45mm C24 joist
Joists fitted at 600mm centres, noggins placed mid-length of frame



Chipboard layer
4mm x 70mm drywall screws
Located at 300mm centres



100mm Rockwool RollBatt
A1 non-combustible insulation, friction fit between studs

4mm x 50mm drywall screws
Located at 300mm centres

12mm Multi-pro
A1 non-combustible Magnesium Oxide board on exposed face

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

LOAD BEARING MODULAR FLOOR/CEILING

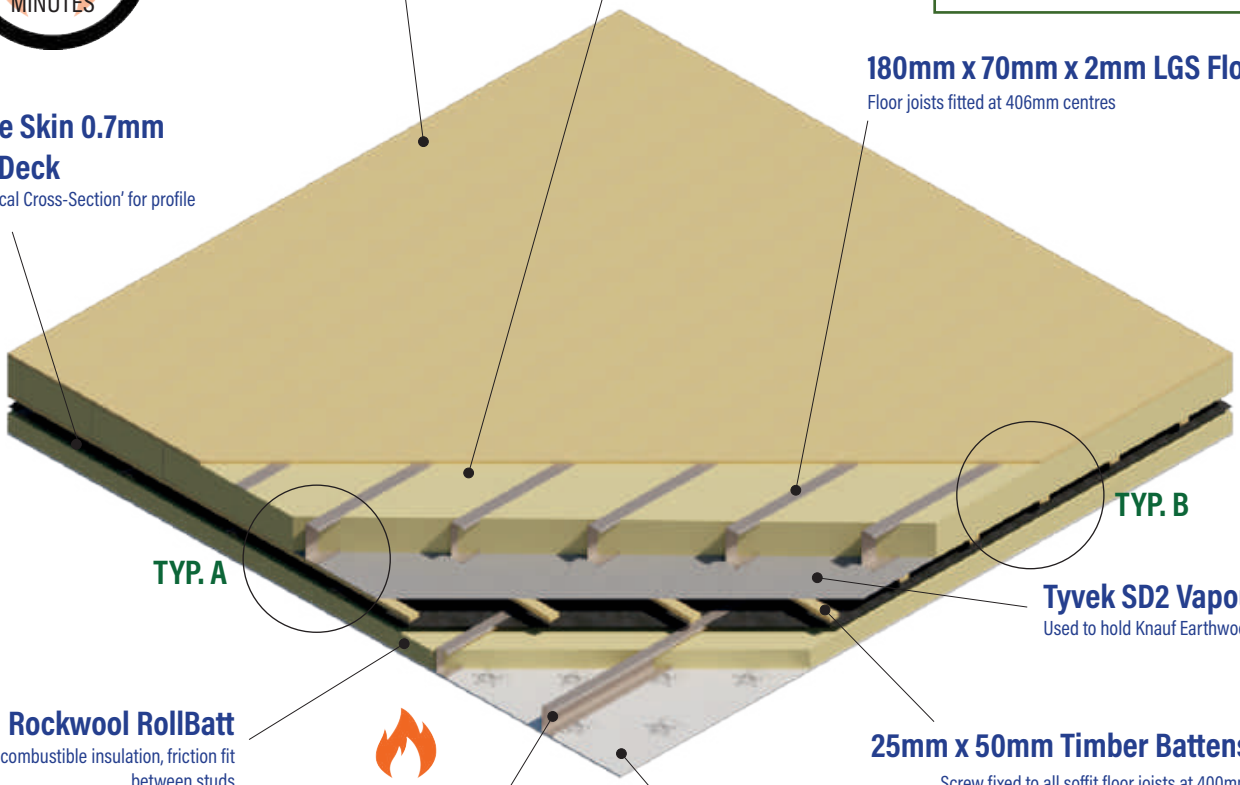
STEEL FRAME

REF: 014_12MP_ST_LB_CEIL_60MIN

60 MINUTES

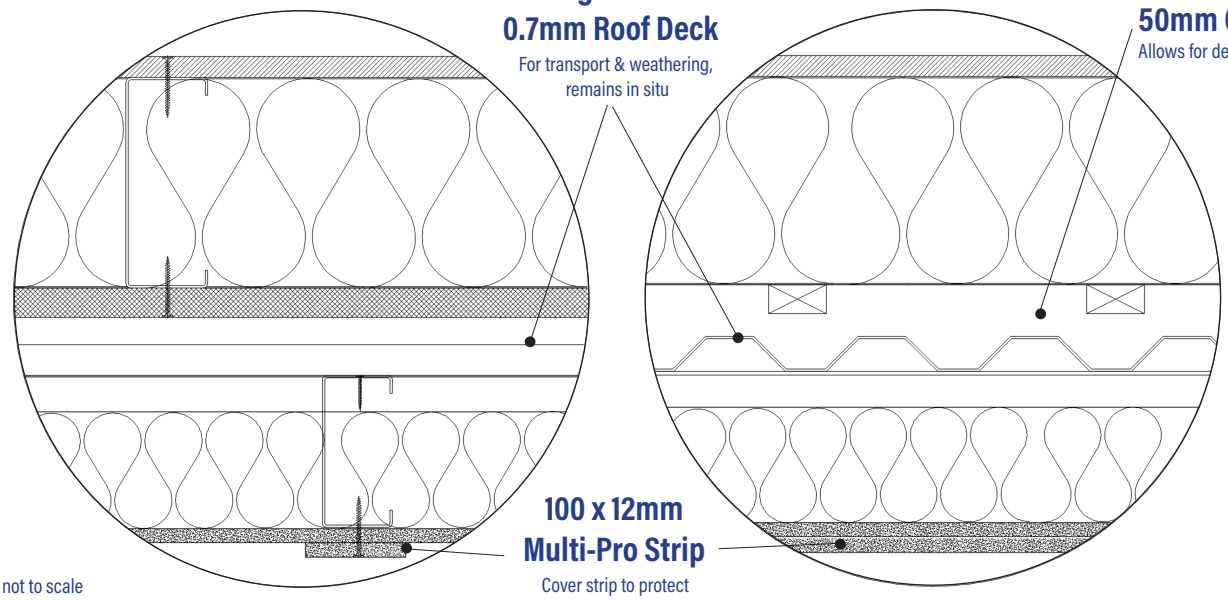
ADDITIONAL INFORMATION

TEST PANEL: 2000 x 1500mm
EXPOSED TEST AREA: 1500 X 1500mm
TESTED BY: Efectis
TEST STANDARD: BS EN 1365-2:2014



Typical Cross-Section A

Typical Cross-Section B



*2D & 3D images not to scale

Note: Copy of actual fire test report available to designers upon request. Please refer to test report for full details.

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