introduction

Fire Wall Cladding systems

In accordance with Building Regulations it may be necessary for specific elements of the building construction to have a stipulated period of fire resistance. Building Regulations Approved Document B (2000 Edition) provides guidelines on suitable forms of fire resistant structures encompassing construction, single element performance, means of escape and fire control.

Categorised from B1 to B5, all of these requirements require integrated design evaluation to ensure effective compliance. Whilst all the conditions that come under consideration for fire performance cannot be included within this publication, the following summarised notes have been listed to help highlight the benefits of specifying Quedron built up profiled steel wall cladding systems.

The following Building Regulations requirements are the most relevant when considering the use of steel cladding systems:

Approved Document B2 - Internal Fire Spread (Linings)

Requirement:

Internal fire spread (linings)
B2 (1) To inhibit the spread of fire within the building the internal linings shall -

(a) resist the spread of flame over their surfaces; and
(b) have, if ignited, a rate of heat release which is reasonable in the circumstances.

Classification of Performance

Building Regulations Approved Document B, Appendix A describes the different classes of performance and the appropriate methods of test. The main classifications used are based on tests to BS476: Parts 6 and 7.

All Quedron supplied organic coated steel cladding products such as Plastisol, PVDF and Lining Enamel, when tested to the above standards have an index (I) not exceeding 12 and a sub-index (i1) not exceeding 6. As a result these products achieve a 'Class 0' spread of flame rating in accordance with Building Regulations requirements (highest rating achievable).

Approved Document B4 – External Fire Spread

Requirement:

External fire spread
B4 (1) The external walls of the building shall resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building.

(b) The roof of the building shall resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.

External Surfaces

The external surfaces of the walls should meet the provisions in Diagram 36, Requirement B4, Section 12.

Using the same test methods as described for internal fire spread, all Quedron supplied organic coated steel cladding products will satisfy the highest achievable rating of 'Class 0'.

Please note that even if the above provisions have been met, buildings that are in excess of 15m above ground level require insulation of limited combustibility. Therefore, all insulation recommended for use within Qsystems achieve non-combustible classification when tested to BS476 Part 4.

Fire Resistance Standard

The external walls of the building should have the appropriate fire resistance given in Building Regulations Approved Document B, Table A1, Appendix A.

This table covers specific provisions of test for fire resistance of elements of structure. Using BS476 Part 22 as the recommended test procedure for non-loadbearing elements, the table stipulates method of exposure, integrity and insulation periods, when positioned at a requisite distance from the relevant boundary.

Building Regulations Approved Document B, Table A1 refers to Table A2 which stipulates the required period of fire resistance based upon building purpose, the height and whether sprinkler systems are to be incorporated.

For example, an external non-loadbearing wall, not more than 18m high, positioned more than a metre from the relevant boundary, will require an integrity period of 90 minutes (non-sprinklered) and an insulation period of 15 minutes.

To satisfy these Building Regulations requirements, Qsystem fire walls have been tested/assessed at approved fire research centres and will meet the following criteria.

SYSTEM TYPES

Qsystem Reference	Orientation	Construction Type	Fire Resistance Period	Insulation Criteria	Exposure	Boundary Distance
VGF 35	Vertical	Outside Rail	4 Hours	15 mins	Inside	>1m
VRF 35	Vertical	Outside Rail	4 Hours	15 & 30 mins	Inside	>1m
HRF 35	Horizontal	Outside Rail	4 Hours	15 & 30 mins	Inside	>1m

GENERAL CONSTRUCTION REQUIREMENTS

1) Position
The external wall must be 1m or more from the relevant boundary (as measured from the outside face of the cladding construction).

2) Type of Building
In accordance with regulation B2 of the Building Regulations it must be defined in Appendix A – Table A2.

3) Height
Refer to Table A2, Appendix A, Part B of the Building Regulations.

4) Special Requirements by Local Authorities
It may be that local interpretations of building regulations vary or that the building merits special consideration. It is essential that the building designer confirms that the Qsystem selected complies with the relevant local authority requirements.

5) Direction of Resistance
Except for the internal partition fire wall (not shown in this brochure) Quedron fire wall systems are designed to resist fire from the inside of the building only.

6) Structural Frame
The fire resistant system must be fixed to sheeting rails, which are fixed to supporting cleats through slotted holes with a bolt incorporating a plastic or low melt washer.

Both elements have the purpose of assisting movement through thermal expansion in the event of a fire. The rails are to be at maximum centres of 2000mm. All sheeting rails need to be single span and need to be shorter than standard to allow for expansion. The remainder of the frame must be protected by suitable material which gives the same period of protection as the wall itself.

7) Support
When the sheeting rails heat up during a fire they will no longer function as a structural member due to loss of strength (usually at 550 degrees celsius). To prevent the wall moving downwards under its own weight, either a support at the base, or a protected eaves beam is required. The intention is that the inclusion of at least one of these features will support the wall during a fire.

BRITISH STANDARD 476

BS476 is the recognised standard referred to within the Building Regulations. This standard outlines the necessary procedures to obtain test related measurements that help define the fire performance of single elements or complete constructions. Parts relevant to Qsystem products/constructions are highlighted as follows:-

BS476 Part 3: External Fire Exposure Roof Test

Roofs classifications are given according to the resistance period they offer when subjected to external fire exposure (e.g. from an adjacent building or compartment). Building Regulations stipulate that pitched roofs produced from organic coated steel will achieve Classification AA – the highest designation possible.

Note:
This standard has been withdrawn. However, the relevant test method appears in the annex of BS5427: 1996 Code of Practice for the use of Profiled Sheet for Roof and Wall Cladding on Buildings and continues to be cited within the Building Regulations.

BS476 Part 4: Non-Combustibility Test for Materials

All insulation products recommended for use within Qsystems achieve 'non-combustible' classification in accordance with this standard and therefore meet the requirements contained within Approved Document B4.

BS476 Part 6: Methods of Test for Fire Propagation for Products

This test ascertains the contribution a material has upon a fire by assessing the rate of heat release over a 20 minute period. Calculated from empirical formula given within the standard, this contribution is expressed as an index of performance (I) together with sub-indices i1, i2 and i3 which relate to heat contribution over shorter time periods.

BS476 Part 7: Methods for Classification of the Surface Spread of Flame of Products

Materials are graded 1 to 4 according to the rate of flame spread across their surface. Class 1 is the highest grade offering the best resistance to surface spread.

The Building Regulations have a higher Class 0 designation which combines the results of BS476 Parts 6 and 7.

BS476 Part 22: Methods for Determination of the Fire Resistance of Non-Loadbearing Elements of Construction

This test is designed to assess the performance of complete elements when exposed to fire on one or both faces of the wall construction. These elements should remain stable, resist penetration of flame, hot gases and limit the transfer of heat from one side to the other.

Two criteria are given to confirm the fire resistance period for a non-load bearing wall construction.

Integrity:

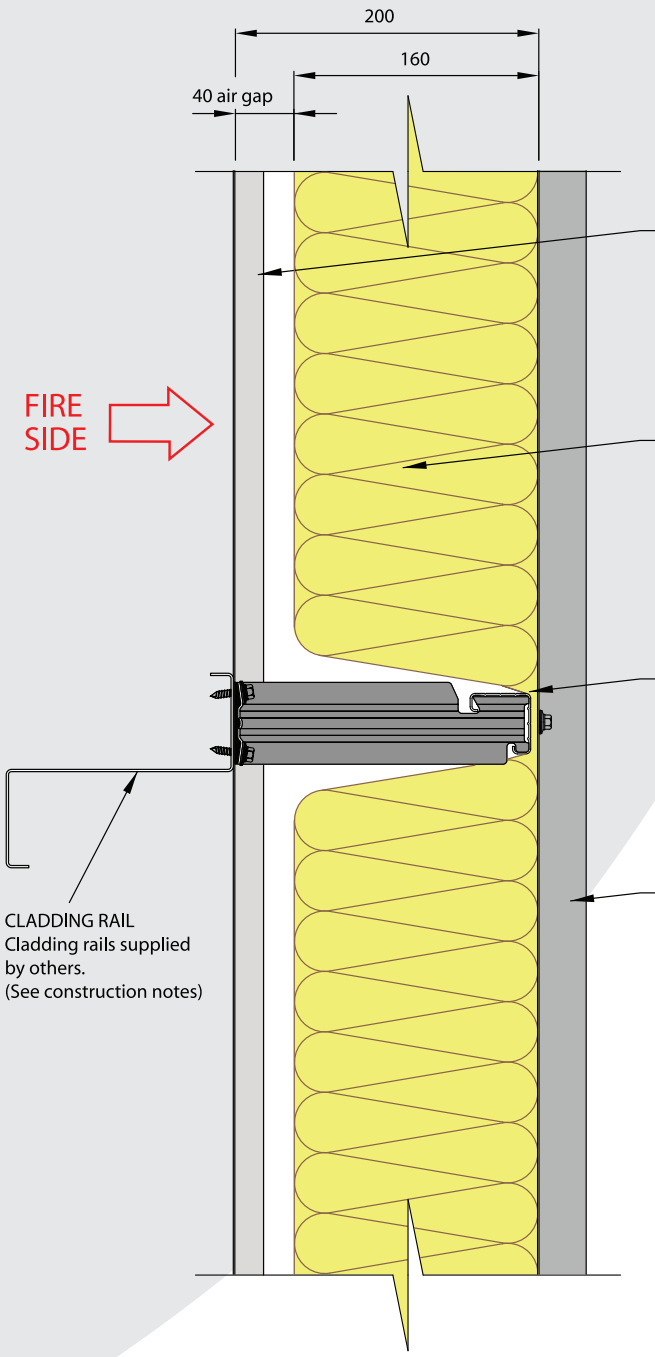
The period a system satisfactorily prevents the passage of flames and hot gases in accordance with the test procedures.

Insulation:

Following the performance criteria within the standard and using designated 'non-combustible' elements only, the period of time they must restrict the transmittance of heat from the fire source to the unexposed face of the wall construction.

4 Hour Fire Rated Vertical Wall Cladding System (Glass Fibre) - 0.35 'U' Value

Fire Wall



SECTION THROUGH WALL

SPECIFICATION

LINING PANEL
0.40/0.70mm Quedron colour coated galvanised steel profiled sheet.

KNAUF INSULATION

INSULATION
160mm thick Knauf Factoryclad 40 compressed between external sheet and spacer bar.
(0.040W/mK Lambda value).

SPACER SYSTEM
200mm deep Quedron spacer bar and bracket.
Position brackets at 1m max centres.

EXTERNAL CLADDING
0.70mm Quedron colour coated galvanised steel profiled sheet.

warringtonfire global safety

WFRC No. 141194 AR
INTERNAL FIRE ASSESSMENT
BS476 Part 22:1987 compliant
Stability - 240 minutes
Integrity - 240 minutes
Insulation - 15 minutes

Note:

Refer to page 28 for profile options and page 37 for profile specific system references and performance data.

Qsystems

Q systems

Q SYSTEM VGF 35

VERTICAL FIRE WALL

This system has been designed for use as a non-load bearing external fire wall situated at least 1 metre away from a relevant boundary. Secured outside rail the construction incorporates glass fibre insulation and satisfies the criteria for 4 hours integrity (15 mins insulation) when assessed to comply with BS476 Part 22: 1987 in relation to internal fire exposure and installed in accordance with Approved Document B (Fire Spread) Building Regulations 2000.

CONSTRUCTION NOTES

Structural Frame	To be protected using suitable materials providing a fire resistance period equal to the cladding system. Support cladding from suitable structural element, e.g: Fire rated eaves beam.
Cladding Rails	Supplied in shorter lengths than normal with slotted holes to facilitate expansion. Install in single span condition using 16mm diameter steel bolts with steel and plastic washers. Rail centres for cladding span not to exceed 2m.
Internal Lining	To meet 15 minute insulation period, stitch lining panel side laps at 450mm centres using steel rivets. e.g: TSPD 44 BS or equivalent.
Vapour Control Layer	Lining Panel - Seal side and end laps.
Insulation	Compress between outer sheet and front face of spacer bar.
Cavity Barrier (Building Regulations Requirement)	Corofil C144 Fire wall filler laid vertically every 20 metres.
External Cladding	Stitch side laps at 450mm centres using 6.3mm diameter steel self drilling screws.

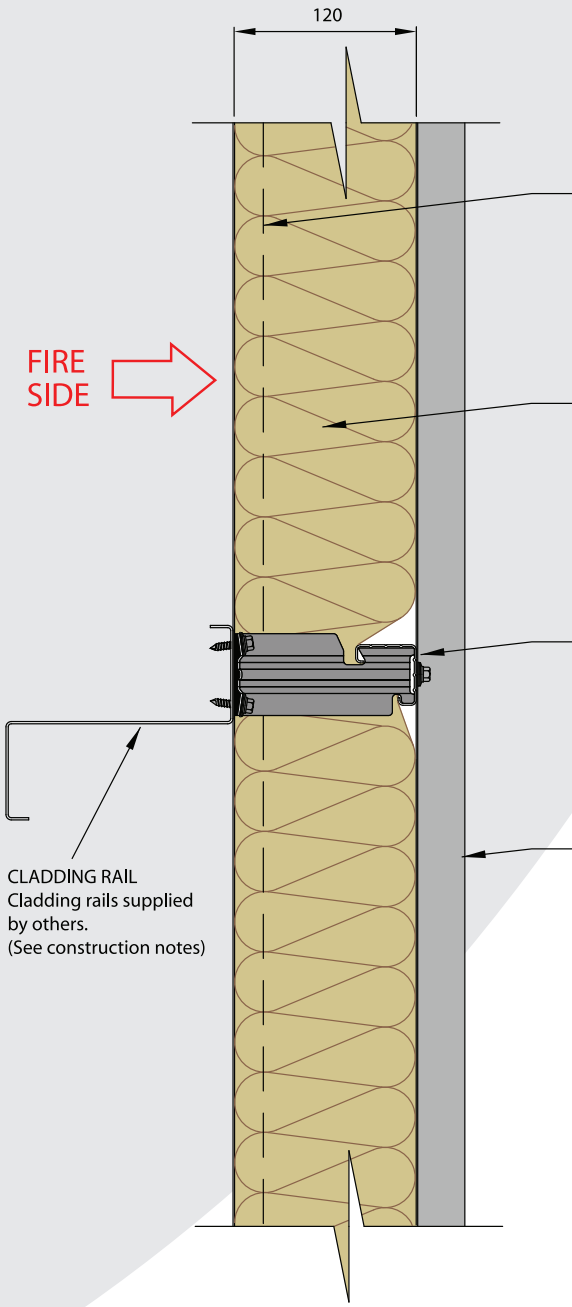
SYSTEM BENEFITS

• Thermal Transmittance (Building Regulations Approved Document L2 compliant)	<0.35W/m²K
• Calculated Average Sound Reduction (weighed S.R.I Rw)	>42dB
• Internal Fire Spread Classification (Building Regulations Approved Document B2, BS476 Parts 6 and 7)	0 (Highest)
• Insulation Non-Combustibility Test (BS476 Part 4, Building Regulations Approved Document B4)	Non - combustible
• Air Permeability (Building Regulations Approved Document L2 compliant)	<10m³/hr/m² @ 50 Pa
• Design Flexibility/Bespoke systems	Available
• Ecological effect	Zero ODP
• Sustainability / Recyclability	Yes
• NBS Specifications	Available
• CAD Construction Specification	Available
• Profile CAD blocks	Available
• Material warranty	Up to 30yrs
• Recommended ancillary suppliers	Yes
• Recommended Installers	Yes

4 Hour Fire Rated Vertical Wall Cladding System (Glass Fibre) - 0.35 'U' Value

4 Hour Fire Rated Vertical Wall Cladding System (Rockwool) - 0.35 'U' Value

Fire Wall



SECTION THROUGH WALL

SPECIFICATION

LINING PANEL
0.40/0.70mm Quedron colour coated galvanised steel profiled sheet.

ROCKWOOL
FIRESAFE INSULATION

INSULATION
120mm thick Rockwool Cladding Roll compressed between internal sheet and spacer bar.
(0.040W/mK Lambda value).

SPACER SYSTEM
120mm deep Quedron spacer bar and bracket.
Position brackets at 1m max centres.

EXTERNAL CLADDING
0.50/0.70mm Quedron colour coated galvanised steel profiled sheet.

warringtonfire
global safety

WFRC No. 141175 AR
INTERNAL FIRE ASSESSMENT
BS476 Part 22:1987 compliant
Stability - 240 minutes
Integrity - 240 minutes
Insulation - 15 or 30 minute options

Note:

Refer to page 28 for profile options and page 37 for profile specific system references and performance data.

Qsystems

Q systems

Q SYSTEM VRF 35

VERTICAL FIRE WALL

This system has been designed for use as a non-load bearing external fire wall situated at least 1 metre away from a relevant boundary. Secured outside rail the construction incorporates Rockwool insulation and satisfies the criteria for 4 hours integrity (15 or 30 mins insulation) when assessed to comply with BS476 Part 22: 1987 in relation to internal fire exposure and installed in accordance with Approved Document B (Fire Spread) Building Regulations 2000.

CONSTRUCTION NOTES

Structural Frame	To be protected using suitable materials providing a fire resistance period equal to the cladding system. Support cladding from suitable structural element, e.g: Fire rated eaves beam.
Cladding Rails	Supplied in shorter lengths than normal with slotted holes to facilitate expansion. Install in single span condition using 16mm diameter steel bolts with steel and plastic washers. Rail centres for cladding span not to exceed 2m.
Internal Lining	To meet 30 minute insulation period, stitch lining panel side laps at 300mm centres using steel rivets. e.g: TSPD 44 BS or equivalent.
Vapour Control Layer	Lining Panel - Seal side and end laps.
Insulation	Compress between lining panel and reverse face of spacer bar.
External Cladding	Where deemed necessary stitch side laps using 6.3mm diameter steel self drilling screws.

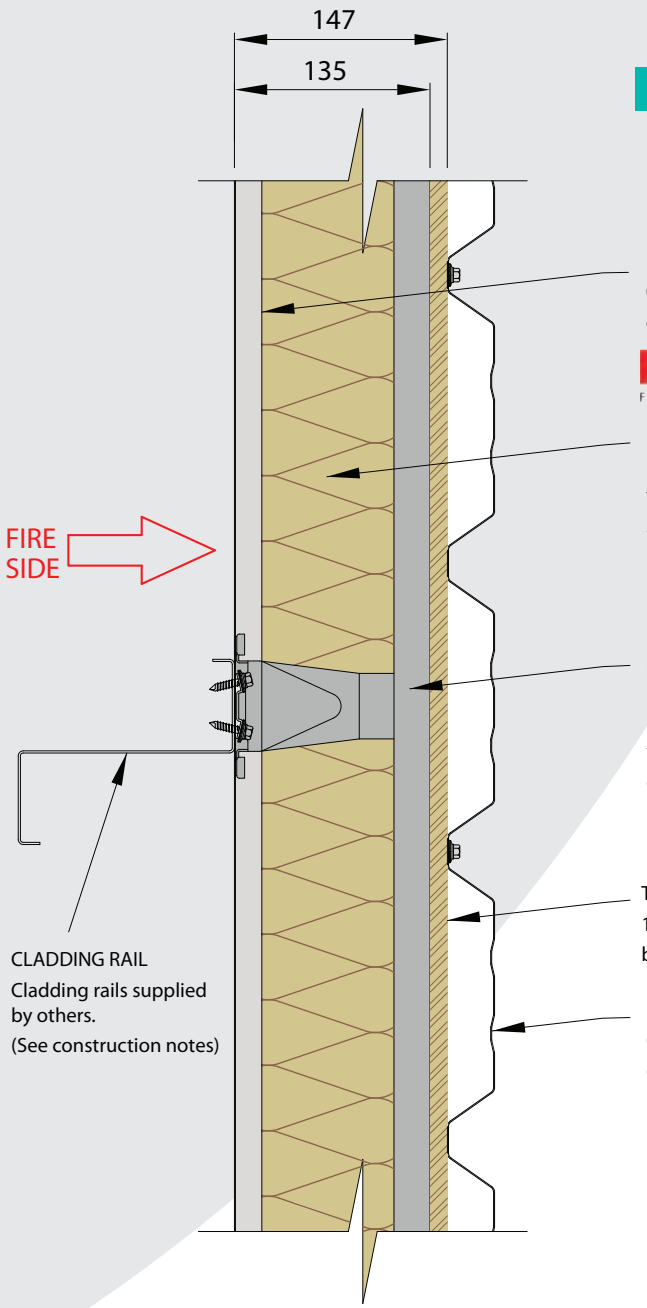
SYSTEM BENEFITS

• Thermal Transmittance (Building Regulations Approved Document L2 compliant)	<0.35W/m²K
• Calculated Average Sound Reduction (weighed S.R.I Rw)	>38dB
• Internal Fire Spread Classification (Building Regulations Approved Document B2, BS476 Parts 6 and 7)	0 (Highest)
• Insulation Non-Combustibility Test (BS476 Part 4, Building Regulations Approved Document B4)	Non - combustible
• Air Permeability (Building Regulations Approved Document L2 compliant)	<10m³/hr/m² @ 50 Pa
• Design Flexibility/Bespoke systems	Available
• Ecological effect	Zero ODP
• Sustainability / Recyclability	Yes
• NBS Specifications	Available
• CAD Construction Specification	Available
• Profile CAD blocks	Available
• Material warranty	Up to 30yrs
• Recommended ancillary suppliers	Yes
• Recommended Installers	Yes

4 Hour Fire Rated Vertical Wall Cladding System (Rockwool) - 0.35 'U' Value

4 Hour Fire Rated Horizontal Wall Cladding System (Rockwool) - 0.35 'U' Value

Fire Wall



SECTION THROUGH WALL

SPECIFICATION

LINING PANEL
0.40/0.70mm Quedron colour coated galvanised steel profiled sheet.

ROCKWOOL
FIRESAFE INSULATION

INSULATION
120mm thick Rockwool Flexislab friction fitted between lining panel and back face of Eurobar Extra rails. (0.038W/mk Lambda value).

SPACER SYSTEM
135mm deep Quedron 'Mast' spacer bar and bracket system, installed vertically with brackets positioned at at 2m max centres (subject to wind load conditions).

THERMAL BREAK
12mm thick Rockwool thermal barrier strip bonded to rail.

EXTERNAL CLADDING
0.70mm Quedron colour coated galvanised steel profiled sheet.

warringtonfire
global safety

WFRC No. 159671 AR
INTERNAL FIRE ASSESSMENT
BS476 Part 22:1987 compliant
Stability - 240 minutes
Integrity - 240 minutes
Insulation - 15 or 30 minute options

Qsystems

Note:

Refer to page 28 for profile options and page 37 for profile specific system references and performance data.

Q systems

Q SYSTEM HRF 35

HORIZONTAL FIRE WALL

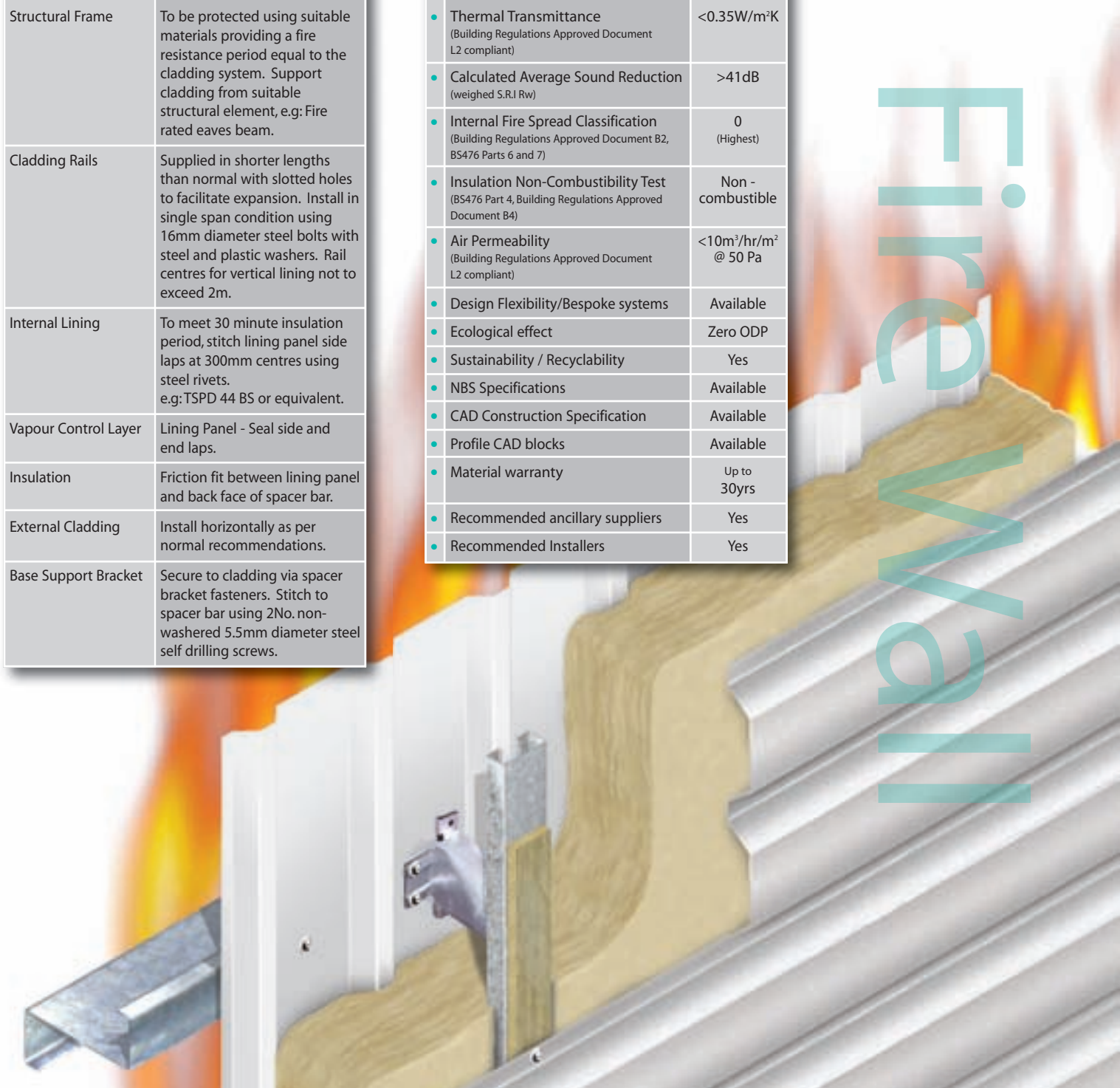
This horizontal cladding system has been designed for use as a non-load bearing external fire wall situated at least 1 metre away from a relevant boundary. Secured outside rail the construction incorporates Rockwool insulation and satisfies the criteria for 4 hours integrity (15 or 30 mins insulation) when assessed to comply with BS476 Part 22: 1987 in relation to internal fire exposure and installed in accordance with Approved Document B (Fire Spread) Building Regulations 2000.

CONSTRUCTION NOTES

Structural Frame	To be protected using suitable materials providing a fire resistance period equal to the cladding system. Support cladding from suitable structural element, e.g: Fire rated eaves beam.
Cladding Rails	Supplied in shorter lengths than normal with slotted holes to facilitate expansion. Install in single span condition using 16mm diameter steel bolts with steel and plastic washers. Rail centres for vertical lining not to exceed 2m.
Internal Lining	To meet 30 minute insulation period, stitch lining panel side laps at 300mm centres using steel rivets. e.g: TSPD 44 BS or equivalent.
Vapour Control Layer	Lining Panel - Seal side and end laps.
Insulation	Friction fit between lining panel and back face of spacer bar.
External Cladding	Install horizontally as per normal recommendations.
Base Support Bracket	Secure to cladding via spacer bracket fasteners. Stitch to spacer bar using 2No. non-washered 5.5mm diameter steel self drilling screws.

SYSTEM BENEFITS

• Thermal Transmittance (Building Regulations Approved Document L2 compliant)	<0.35W/m²K
• Calculated Average Sound Reduction (weighed S.R.I Rw)	>41dB
• Internal Fire Spread Classification (Building Regulations Approved Document B2, BS476 Parts 6 and 7)	0 (Highest)
• Insulation Non-Combustibility Test (BS476 Part 4, Building Regulations Approved Document B4)	Non - combustible
• Air Permeability (Building Regulations Approved Document L2 compliant)	<10m³/hr/m² @ 50 Pa
• Design Flexibility/Bespoke systems	Available
• Ecological effect	Zero ODP
• Sustainability / Recyclability	Yes
• NBS Specifications	Available
• CAD Construction Specification	Available
• Profile CAD blocks	Available
• Material warranty	Up to 30yrs
• Recommended ancillary suppliers	Yes
• Recommended Installers	Yes



4 Hour Fire Rated Horizontal Wall Cladding System (Rockwool) - 0.35 'U' Value