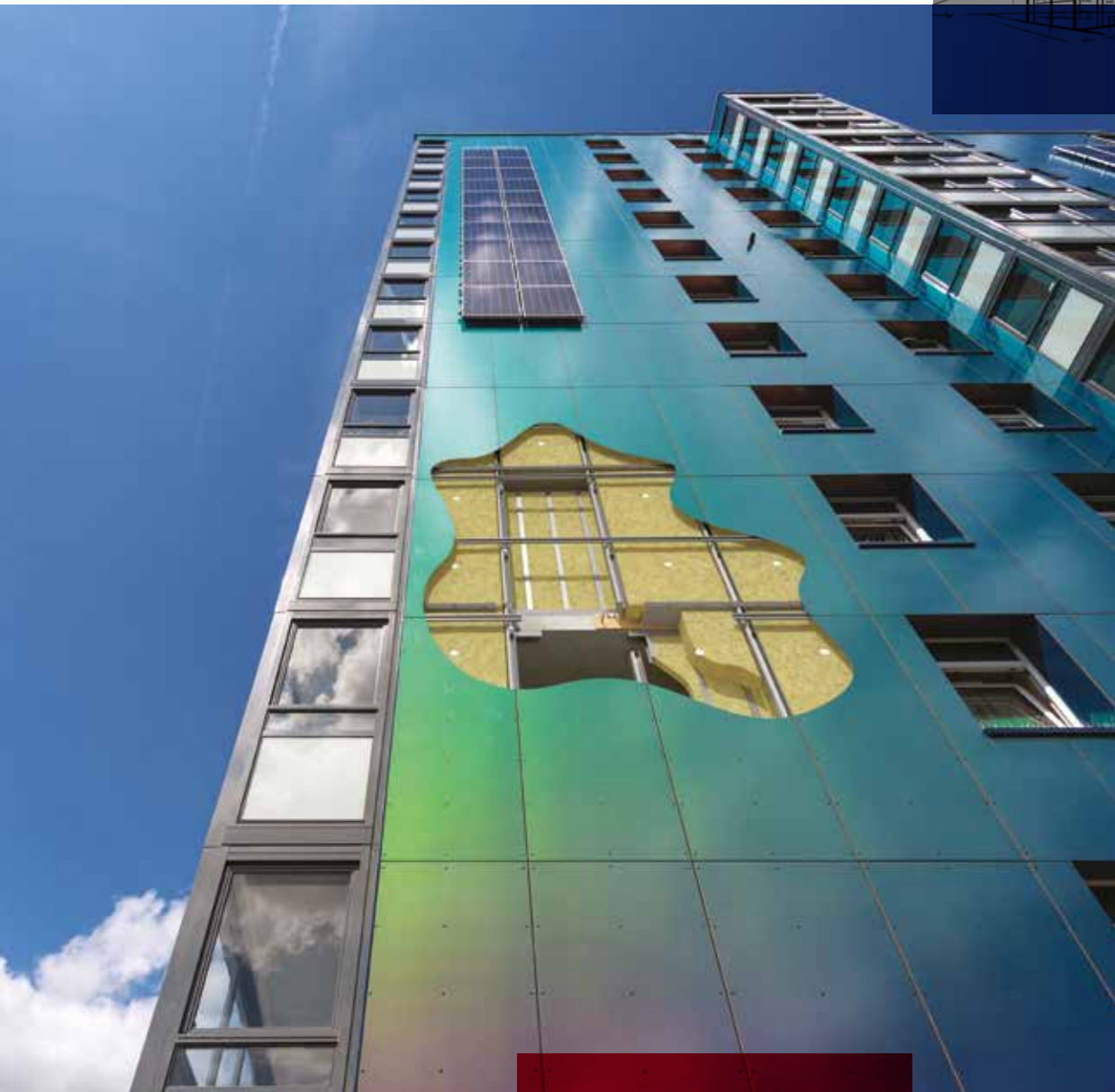
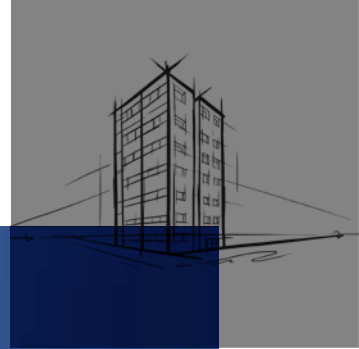


High Rise Buildings with a Floor Level Above 18m

Designing out the Risk



Compliance Without Compromise: Ventilated Façades

How non-combustible ROCKWOOL insulation minimises the risk of fire spread within ventilated Rainscreen Cladding and External Wall Systems in high rise buildings with a floor level above 18m.



Introduction

With literally thousands of material, texture and colour combinations available, Rainscreen Cladding and External Wall Systems offer designers increased flexibility and the freedom to design bespoke systems for clients and building owners.

Modern methods of construction, like ventilated Rainscreen Systems, are becoming increasingly popular and often replace more traditional building techniques.

A combination of innovative construction methods and a stronger demand for improved thermal performance, has resulted in an increase in the amount of thermal insulation used within cladding systems.

Many of the thermal insulation products that are used with Rainscreen Systems are combustible, and this means that the potential combustible fire load within the system can significantly increase.

This technical publication will provide a detailed look at the various routes to compliance, when considering the use of insulation within façades of buildings with a floor level above 18m, and how to interpret the guidance which is set out in Approved Document B2 and the Building Control Alliance Technical Note 18.

Fire-safe Rainscreen Systems can be created without having to compromise on design, so this publication will also look at how non-combustible products such as stone wool not only minimise risk but also provide a number of key benefits that support freedom for creative design.

Contents

4

The 4 Routes to Compliance

- Option 1** Materials of Limited Combustibility 4
- Option 2** Meeting the Criteria of BR135 5
- Option 3** Qualified Desktop Study 6
- Option 4** Holistic Fire Engineered Approach 7

8

Step-by-Step Guide to Compliance

10

Compliance without Compromise

- Designing out Risk 10
- ROCKWOOL Fire Safe Rainscreen Systems 11



The 4 Routes to Compliance

Requirement B4(1) of the Building Regulations states that the external walls of the building shall adequately resist the spread of fire over the walls... having regard to the height, use and position of the building.

The use of combustible materials within the cladding system and extensive cavities present a risk in tall buildings.

There are four recognised routes to compliance that provide guidance on measures that can be taken to satisfy building regulations and standards, when insulating façade systems on buildings above 18 metres.

Option 1

Materials of Limited Combustibility

The first and by far least restrictive option is to use materials of limited combustibility (MOLC) for all elements of the cladding system that are situated both above and below 18m.

This includes the insulation, internal lining board and the external cladding panel. Smaller gasket parts and similar low risk items can be excluded from this requirement. The definition of a MOLC is stated in Table A7 of ADB2. The table on page 5 shows the fire classification for different insulation materials.

It is important to note that a Surface Spread of Flame Classification does not infer any resistance to combustibility; it is solely a measure of the spread of a flame across the materials surface.

Always ask for a copy of the product's Declaration of Performance in order to verify its fire classification.



OPTION 1 Fire Classification for Different Insulation Materials

Euro-class EN 13501-1	England, Wales, Northern Ireland	Scotland	Materials
A1	Non-combustible	Non-combustible	Stone Wool, Glass Wool, Foamglas
A2 (or better)	Limited Combustibility	Non-combustible	High Density & High Binder or Faced Stone/Glass Wool
B-s3, d2 (or better)	0	Low Risk (0)	Some Phenolic Foams
C-s3, d2 (or better)	1	Medium Risk (1)	Phenolic, some PIR
D-s3, d2 (or better)	3	High Risk (2 & 3)	PIR
E-s3, d2 (or better)	4	Very High Risk	Flame Retarded EPS/XPS, PUR
F-s3, d2 (or better)	Not Classified	Very High Risk	EPS, PIR

Option 2

Meeting the Criteria of BR135

This option requires the client to submit evidence to demonstrate that the proposed system has been assessed according to the acceptance criteria set out in BR135 - Fire Performance of External Thermal Insulation for Walls of Multi-storey Buildings.

The method for demonstrating compliance is through a fire test carried out in accordance with BS8414, which can be split into two parts, Part 1: Test method for non-loadbearing external cladding systems applied to the face of the building or Part 2: Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame.

The tests should always be carried out by an independent UKAS accredited testing body. The BS8414 tests do not give a pass/fail answer because the data obtained is used by different bodies with different minimum requirements.

Hence, for building regulation purposes any test using this method needs to be supported with a classification report for the proposed specification confirming that the specification criteria of BR135 has been met.

These acceptance criteria are listed in Annex A or Annex B of BR135 and include the following:

- External and Internal Fire Spread - determined by a 600°C rise in temperature on the external/internal face of the building (measured at a point approximately one storey above the fire floor) for thirty seconds or more during the initial fifteen minutes of the test
- Mechanical Performance - determined by an assessment of building collapse, spalling, delamination, flaming debris or fire pools.

With thousands of potential material combinations it is important to check that the system you have specified meets the criteria set out in BR135.

Whilst option two will ensure that adequately tested systems are used, as a designer you are limited to the tested solutions currently available and these are very few. Using non-combustible products removes the need for a tested system offering better choice and design flexibility.

Always ask to see a copy of the material manufacturer's classification report and Declaration of Performance for confirmation of compliance.



Option 3

Qualified Desktop Study

If a particular system lacks the appropriate test data then the client may instead submit a desktop study report from a suitably qualified fire specialist stating whether, in their opinion, BR135 criteria would be met with the proposed system.

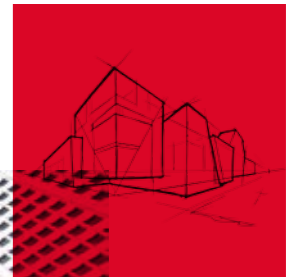
The report submitted must be supported by test data from a suitably qualified fire engineer with appropriate expertise in dealing with combustible façades. It is important to note that the desktop study report is only of use if the proposed products have already been tested in multiple situations/arrangements.

A desktop study report should never be accepted without the supporting test data and all reports should specifically reference the tests which have been carried out on the proposed products.

When adopting option 3 as a route to compliance always engage with both building control and any relevant insurance provider to ensure they are satisfied with the level of testing that is being assessed.

The Report

The report submitted must be supported by test data



Option 4

Holistic Fire Engineered Approach

If, for whatever reason, options 1 to 3 are not suitable then the builder may consider a holistic fire engineered approach for the entire building.

Whilst Approved Document B – Volume 2 recognises that fire safety engineering is an acceptable alternative, it is worth considering the significant increase in costs that this option may accrue. If a holistic fire engineered approach is the chosen route to compliance, then AD B2 cites the British Standard BS7974, Fire Safety engineering in buildings suite of documents, as a suitable framework on which to base the design and assessments of all fire safety measures in buildings.

It must be noted that this approach is a complex process with eight parts of BS7974:2001 that require consideration:

- Guide to design framework and fire safety engineering procedures
- Initiation and development of fire within the enclosure of origin
- Spread of smoke and toxic gasses within the enclosure of origin
- Structural response and fire spread beyond the enclosure of origin
- Detection of fire and activation of fire protection systems
- Fire and rescue service intervention. Human factors. Life safety strategies
- Occupant evacuation, behaviour and condition
- Probabilistic risk assessment.

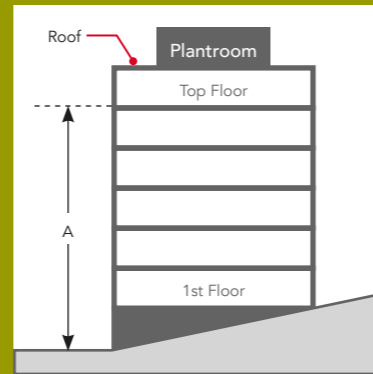
Step-by-step Guide to Compliance

Simplicity, cost-effectiveness and safety of using non-combustible materials.

START

Does the building have a floor at a height of 18m or greater above ground level?

To determine the height of the top storey of a building:
 Measure from the ground floor level (on the lowest side of the building) to the **upper floor surface** of the top floor level (see A).
Rooftop plant areas and any top storeys consisting solely of plantrooms are excluded.



NO

YES

COMPLIANCE ACHIEVED

These regulations do not apply to buildings of under 18m in height.

OPTION 1

Do the materials proposed for use within the Rainscreen Façade System have an EN reaction to fire classification of A1 (non-combustible) or A2 (limited combustibility)?

NO

Then you will need to consider more complex routes to compliance...

YES

COMPLIANCE ACHIEVED

No additional test or qualification reports are required and none of the other routes to compliance are needed, saving significant time and expense.

All ROCKWOOL insulation products achieve these standards.



OPTION 2

Performance-based Route

Does the proposed façade insulation system meet the criteria of either BR135 or has it undergone a classification report from a UKAS accredited body?

NO

OPTION 3

Qualified Desktop Study

You will need to appoint a qualified UKAS fire engineer and provide supporting fire test data for multiple scenarios.

NO

OPTION 4

Holistic Fire Engineered Approach

If your system is still not compliant you will have to consider a Holistic Fire Engineered Report with all the significant costs associated with it.

Desktop Study and Performance Reports can take anything from 2 to 6 weeks to complete and can be very complex.

Providing the fire specialist with sufficient, accurate and detailed information from the outset will minimise any risk of delay, but using a product that does not need this for compliance is a much better option.

The type of information required includes, but is not limited to:

- First and foremost, all applicable fire test data for all components of the façade system build-up - in particular that for the external surface of the façade

- Plans (building design, location etc)
- Elevations (location of cladding materials, configuration of fire stops etc)
- Section details (façade build-up, fire barriers at junctions and openings etc)
- Material specification (type, thickness, performance data and relevant certification).

Compliance Without Compromise

Designing Out Risk

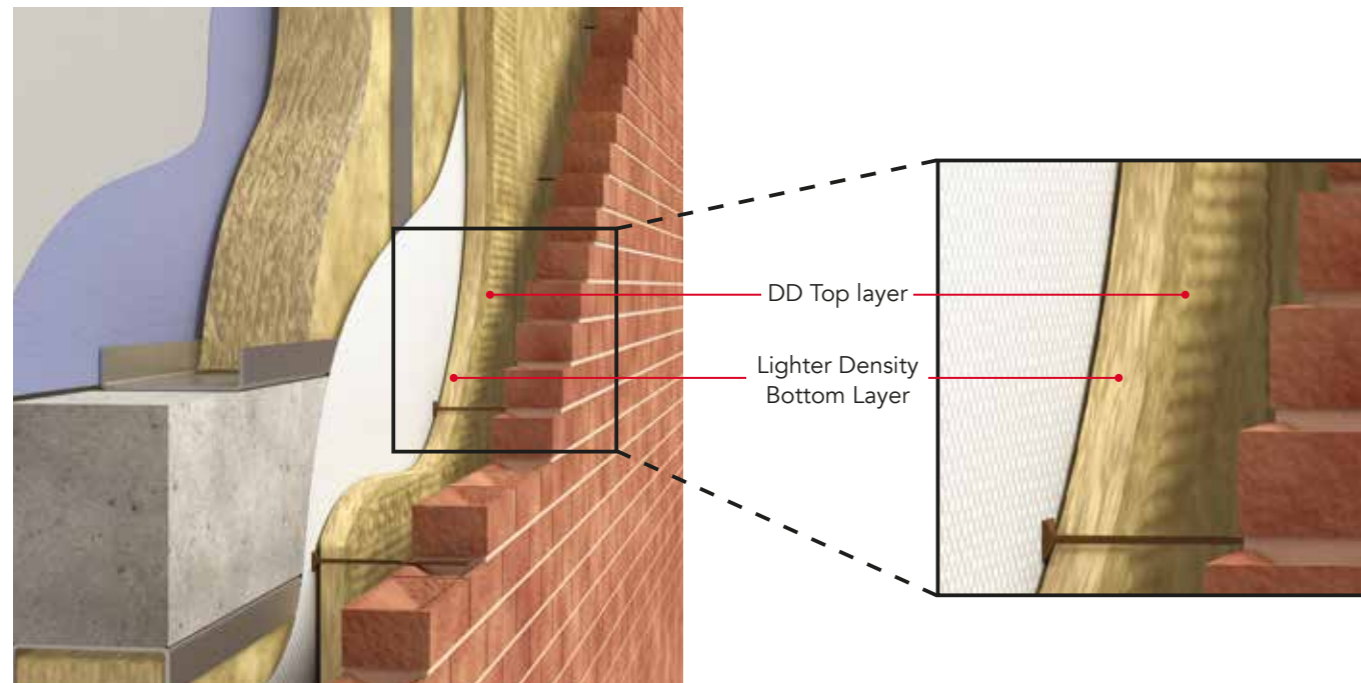
Using non-combustible materials wherever possible is the simplest and easiest method of designing out risk and meeting the criteria of Building Regulations.

ROCKWOOL RAINSCREEN DUO SLAB® has been rigorously tested to BS EN 13501: 2007, achieving the highest possible European Reaction to Fire Classification - A1 Non-Combustible.

As well as offering low risk solutions, ROCKWOOL Rainscreen products also provide many other benefits including:

- Dual Density Technology for outstanding durability
- Pliable fit which results in fewer gaps and reduced thermal bridging
- Improved acoustic performance.

Non-combustible ROCKWOOL insulation also provides a compliant solution for non-ventilated cladding systems that are specified for use above 18 metres.



ROCKWOOL Fire Safe Rainscreen Systems

Using stone wool products within the rainscreen cavity does not mean you have to compromise on thermal performance.

ROCKWOOL FLEXI®

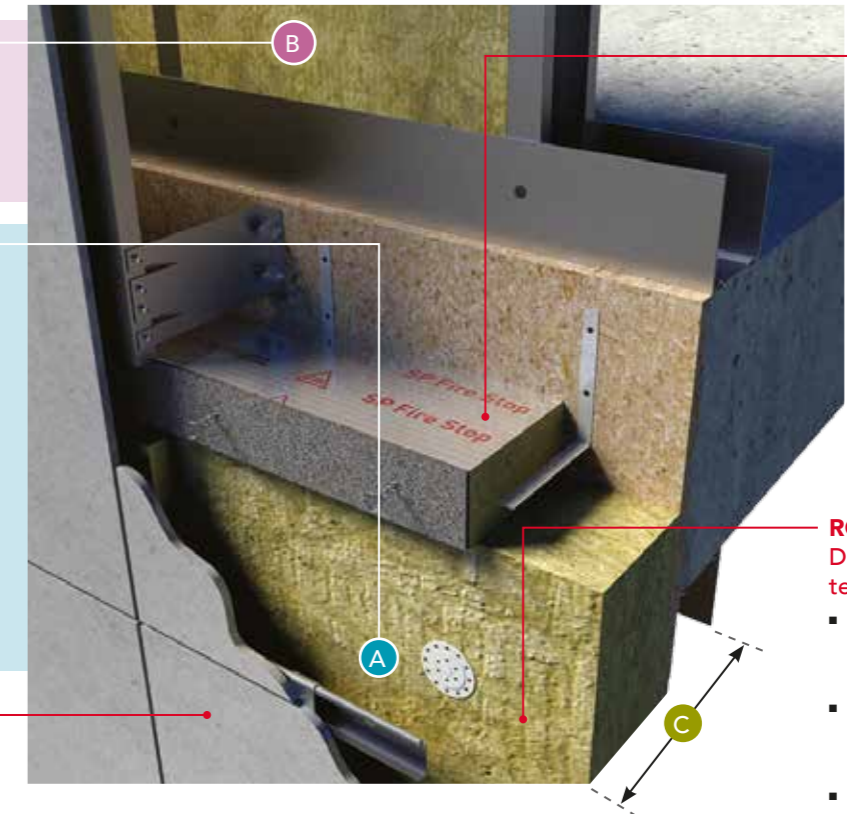
- Patented 'Flexi' edge provides an accurate fit
- Excellent thermal, acoustic and fire performance

ROCKWOOL RAINSCREEN DUO SLAB®

- Euroclass A1 non-combustible
- Fibres knit together between boards which remove gaps
- Easily pliable around brackets to reduce thermal bridges
- Accommodates uneven surfaces
- Supports acoustic design

ROCKWOOL Rockclad FS-Xtra

- Euro-class A2



ROCKWOOL SP Firestop VRB

- Tested to ASFP TGD 19
- 60 minutes fire integrity and insulation

ROCKWOOL Dual Density technology provides:

- A robust outer layer that does not require additional protection
- High tolerance to wind and rain during construction
- Resistance to the over-driving of fixings

A	B	C	
RAINSCREEN DUO SLAB® Thickness (mm)	FLEXI® Thickness (mm)	Overall Wall Thickness (mm)*	U-values W/m²K
100	140	319	0.22
125	140	344	0.20
150	140	369	0.19
180	140	399	0.17

* The overall wall thickness is based on the system shown in the image and has been calculated with a 50mm ventilated cavity zone.



U-value, or thermal calculators, are not new to the construction world

Download the latest calculator (incorporating BIM) from the ROCKWOOL website for access to all the technical and construction information you need to calculate the thermal performance of walls, floors and roofs for your project.

To download go to www.rockwool.co.uk

ROCKWOOL Limited

Pencoed
Bridgend
CF35 6NY

01656 862 621
info@rockwool.co.uk
www.rockwool.co.uk

RW17 115 14.07.17

