High-rise buildings

Meeting the guidance within Approved Document B Volumes 1 & 2 (England)

ROCKWOOL®

Contents

Compliance without compromise: ventilated façades

Systems using non-combustible ROCKWOOL stone wool insulation can minimise the risk of fire spread within ventilated rainscreen cladding and external wall systems in high rise buildings.

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.

This technical publication will provide a detailed look at Requirement B4 of Building Regulations, and the guidance offered in Approved Document B, when considering the use of insulation and other materials within the external wall systems of buildings with a storey 18m above ground level.

Non-combustible rainscreen systems can be created without having to compromise on design. This publication will look at how non-combustible products such as ROCKWOOL stone wool insulation can be used to not only minimise risk but also provide key benefits that support freedom of creative design.

Requirement B4 of Building Regulations

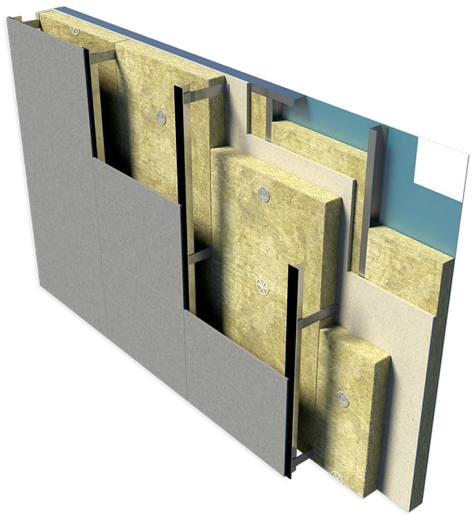
Requirement B4(1) of the Building Regulations states, "The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building"

When considering the external wall system of a high rise, multi-unit building, there is the potential for fire to attack the cladding in a variety of ways:

- Flames issuing out of windows
- Fire radiation from adjacent buildings
- Ignition through arson

The use of non-combustible materials within the external wall system can limit the spread of fire and the risk of secondary compartment fires in other parts of the building.

The guidance offered within Approved Document B recognises the risks associated with the use of combustible materials within cladding systems and extended cavities.



"The external walls of the building shall adequately 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."

Requirement B4(1) of Building Regulations

The importance of defining non-combustibility

The following guidance is given in section 10.1 of Approved Document B1 and 12.1 of Approved Document B2:

"The external wall of a building should not provide a medium for fire spread if that is likely to be a risk to health and safety. Combustible materials and cavities in external walls and attachments to them can present such a risk, particularly in tall buildings."

Further, related guidance is provided in the advice note issued by MHCLG in January 2020, "Advice for Building Owners of Multi-Storey, Multi-occupied Residential Buildings":

"Existing residential buildings which have external wall systems that contain combustible materials may not meet an appropriate standard of safety and could pose a significant risk to the health and safety of residents, other building users, people in the proximity of the building or firefighters. External walls of residential buildings should not assist the spread of fire, irrespective of height. It is important therefore to understand both the materials used in the external wall construction and whether the entire system has been designed, installed, and maintained appropriately."

Understanding if an insulation product is combustible

By law, all building insulation products subject to a harmonised EN standard must be CE marked - which means manufacturers must declare a fire performance classification known as a **Euroclass rating** for each of their products.

The Euroclass system determines a product's reaction to fire performance by measuring a comprehensive set of characteristics, including ignitability, flame spread, heat release, smoke production and propensity for producing flaming droplets/ particles. The classifications run from A1 to F and are defined in the table below.

Products are classified from A1-F:

Euroclass	Combustibility
A1	Non-combustible
A2-s1, d0	
B	**Combustible**
C	
D	
E	
F	

ROCKWOOL stone wool insulation is A1 NON-COMBUSTIBLE, meaning it does not burn, makes no contribution to fire growth and presents no smoke hazard.

Where can Euroclass ratings be found?

The Euroclass rating of a product can often be missing from its data sheet making it difficult to determine the combustibility of some products. However, manufacturers are legally bound to report this information in the product's '**Declaration of Performance**' (or 'DoP').

The DoP is a legal document in which the manufacturer identifies the product and its intended use, indicating compliance in relation to the relevant Harmonised Product Standard and performance in relation to specified "essential characteristics", including reaction to fire, thermal performance, etc.

These documents should be freely available from the manufacturer's website, but you may find that you have to specifically ask for a copy.

All ROCKWOOL DoP's are available online at rockwool.com/dop

DECLARATION OF PERFORMANCE **No: UK-WER-0031-02_english**

RAINSCREEN DUO SLAB

http://dop.rockwool.com

1.	Unique identification code of the product-type	UK-WER-0031-02_english
2.	Intended use of the construction product as foreseen by the manufacturer, in accordance with the applicable harmonised technical specification	Thermal insulation for buildings
3.	Name, registered trade name or registered trade mark and contact address of the manufacturer, as required pursuant to Article 11(5) of regulation (EU) No 305/2011	ROCKWOOL® Limited Pencoed, Bridgend, CF35 6NY
4.	Applicable System or Systems of Assessment and Verification of Constancy of Performance (AVCP)	SYSTEM 1 for uses subject to regulations on reaction to fire SYSTEM 3 for all other intended uses
5.	Harmonised Standard reference number and date of issue	BS EN 13162:2012 +A1 2015 Issued on 28 February 2013
6.	Notified Body identification number	0086
7.	Declared Performances	Please refer to the table below (NPD – No Performance Determined)

Essential Characteristics	Requirement clauses in this European Standard	Level and/or classes	Declared value
Reaction to fire Euroclass characteristics	4.2.6 Reaction to fire	Euroclasses	A1

Ban on combustible materials in the external walls of buildings over 18m

On the 29th of November 2018, the Government announced a ban on the use of combustible materials in the walls of certain buildings over 18m, effective from 21st December 2018.

The ban is implemented by changes to Regulation 7 of the Building Regulations ('Materials and workmanship') and the guidance in Approved Document B.

> *Regulation 7(2)*
>
> *Subject to paragraph (3), building work shall be carried out so that materials which become part of an external wall, or specified attachment, of a relevant building are of European Classification A2-s1, d0 or A1, classified in accordance with BS EN 13501-1:2007+A1:2009 entitled "Fire classification of construction products and building elements. Classification using test data from reaction to fire tests" (ISBN 978 0 580 598616) published by the British Standards Institution on 30th March 2007 and amended in November 2009.*

Since the ban also covers any 'specified attachment' to the external wall, careful consideration is required when specifying ancillary materials such as insulation fixed to upstands and parapet walls.

The ban applies to any building with a storey over 18m above ground level which:

i. Contains one or more dwellings

ii. Contains an institution (e.g. hospitals, care homes, residential schools, sheltered accommodation, student halls of residence)

iii. Contains a room for residential purposes (excluding hostels, hotels and boarding houses)

It is important to note that the ban applies not just to new-build, but covers 'material change-of-use' as well – so if a tall building may be subject to multiple usage types over its lifetime, building owners and developers should bear this in mind at the outset to avoid having to replace non-compliant materials later.

Further information can be found in Section B4 of Approved Document B Volumes 1 and 2.

Excluded building types

For buildings over 18m that are not covered by the ban on combustible materials contained in Regulation 7(2), there are two principal ways to comply with the guidance provided in Approved Document B – these are discussed further on as Option 1 and Option 2.

Beyond the advice given in the current version of Approved Document B, there is a growing recognition that combustible materials in the external walls of buildings can pose a risk to safety – regardless of a building's height.

In July 2019, MHCLG issued a Circular to Building Control Bodies in which they advise "While the use of combustible materials within or attached to the external walls of buildings below 18m are not expressly prohibited, it is necessary to consider the risk from fire spread to health and safety in relation to any height".

Further, in a January 2020 consolidated MHCLG Advice Note for Building Owners, the Independent Expert Advisory Panel wrote that they "strongly advise that building owners should already be actively ensuring the safety of residents, and not wait for the regulatory system to be reformed".

This was followed by a review of the combustible material ban in which MHCLG proposes lowering the height threshold of the ban to 11 metres.

ROCKWOOL recommends that non-combustible materials be used in the building envelope of all high-risk buildings wherever possible, including:

- All buildings taller than 11m;
- All buildings having more than three storeys;
- Vulnerable occupancy buildings of any height, including hospitals, schools, sheltered housing, care homes and entertainment venues.

It is worth noting that under new legislation in Scotland, developers will be banned from using combustible materials within cladding systems applied to the external walls of relevant buildings above 11 metres in height. This ban comes into force on the 1st of June 2022.

Buildings over 18m not covered by the ban

Option 1 - Use Euroclass A1 and A2 rated materials.

• Materials

Approved Document B2 provides the guidance that, in a building with a storey 18m or more in height, any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) etc. used in the construction of an external wall should be class A2-s3, d2 or better.

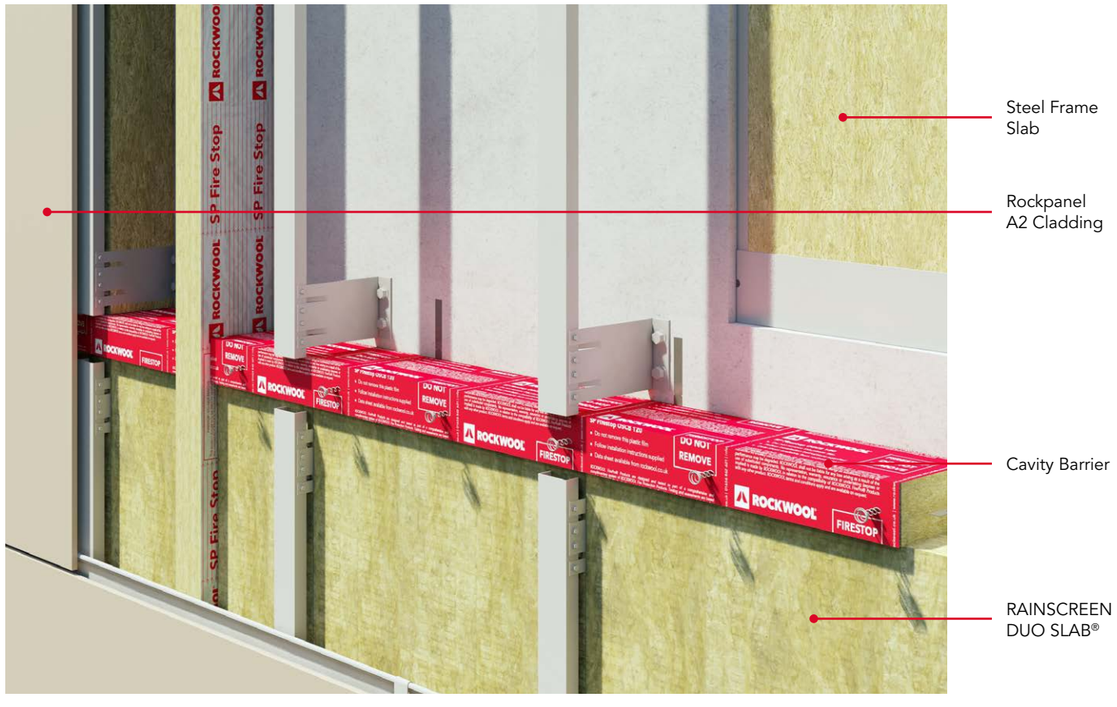
Where Regulation 7(2) applies, that regulation prevails over all the provisions in this paragraph.

• Cavity Barriers

Cavity barriers should be provided to close the edges of cavities, including around openings and should also include:

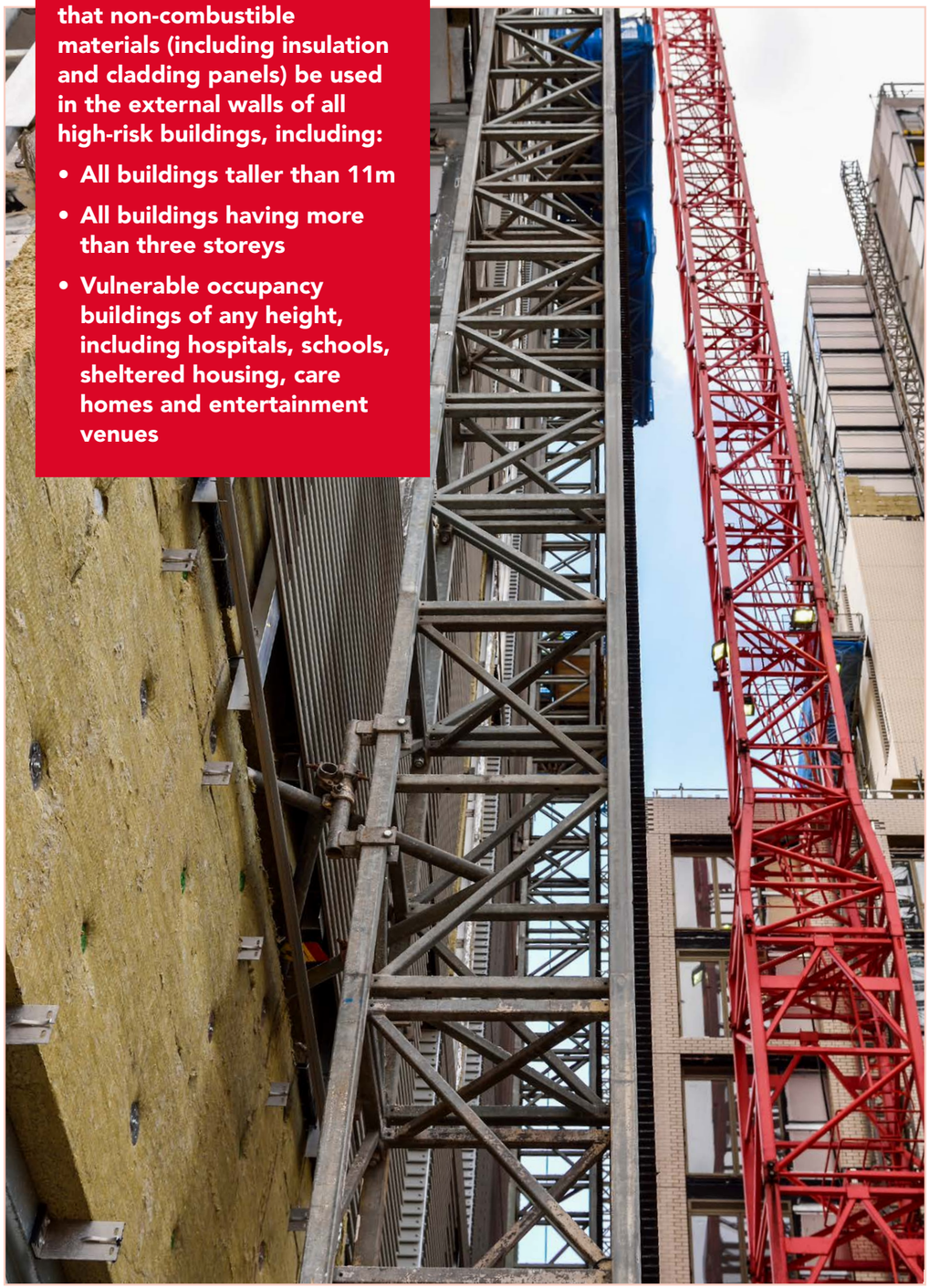
a. The junction between the external cladding and compartment wall (e.g. ROCKWOOL SP Firestop).

b. The junction between the cladding and the compartment floor (e.g. ROCKWOOL SP Firestop OSCB).



ROCKWOOL recommends that non-combustible materials (including insulation and cladding panels) be used in the external walls of all high-risk buildings, including:

- **All buildings taller than 11m**
- **All buildings having more than three storeys**
- **Vulnerable occupancy buildings of any height, including hospitals, schools, sheltered housing, care homes and entertainment venues**

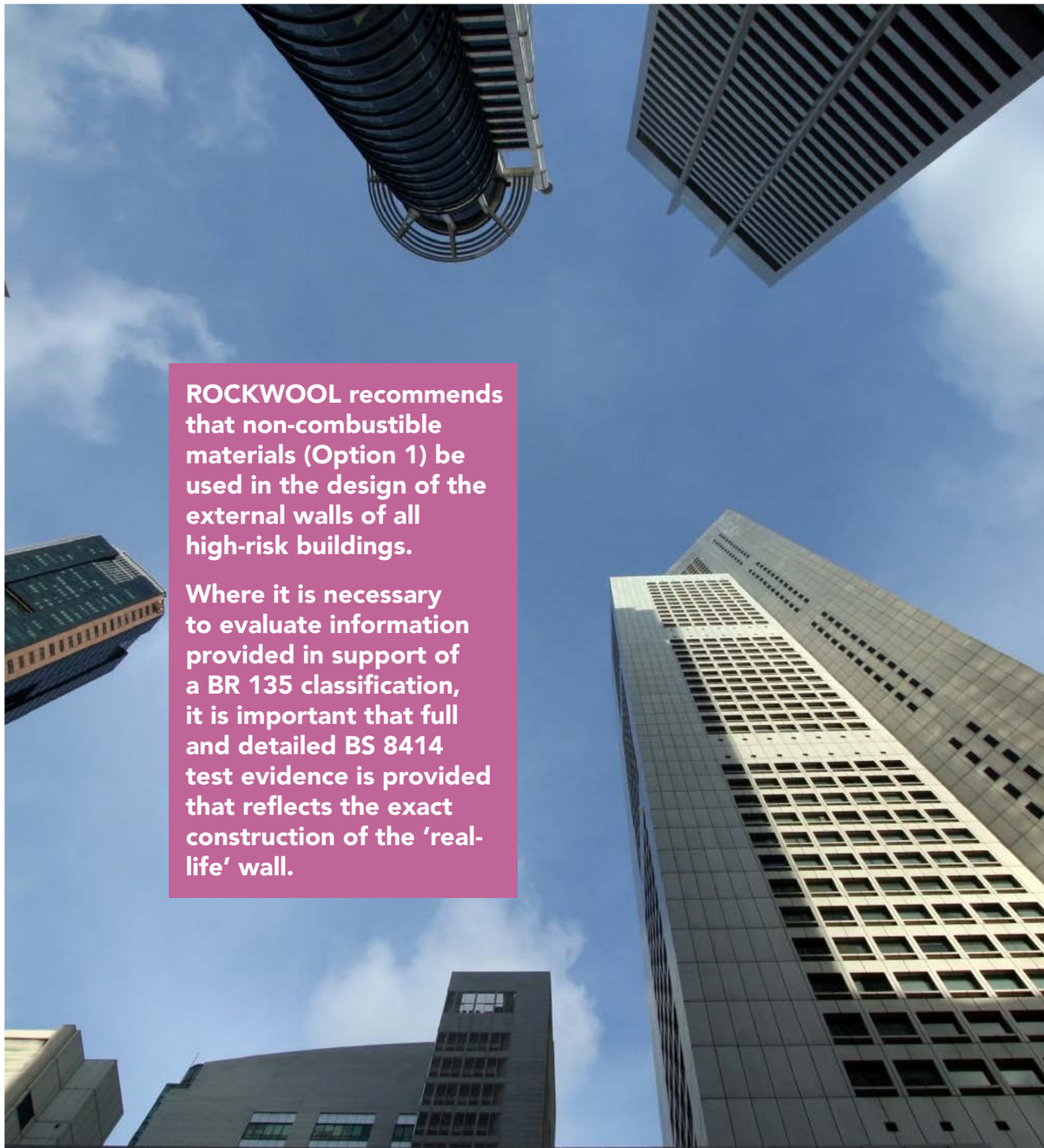


Option 2 - Meet the performance criteria given in BRE report BR 135 for external walls, using test data from external cladding system fire performance test BS 8414-1 or BS 8414-2.

ROCKWOOL recommends that non-combustible materials (Option 1) be used in the design of the external walls of high-risk buildings, rather than Option 2.

We believe this is the right approach, taking into consideration the significant design and workmanship challenges faced to safely adapt and use an Option 2 solution for use in a complex, real-life building façade.

Where it is necessary to evaluate information provided in support of a BR 135 classification, it is important that full and detailed BS 8414 test evidence is provided that reflects the exact construction of the 'real-life' wall.



ROCKWOOL recommends that non-combustible materials (Option 1) be used in the design of the external walls of all high-risk buildings.

Where it is necessary to evaluate information provided in support of a BR 135 classification, it is important that full and detailed BS 8414 test evidence is provided that reflects the exact construction of the 'real-life' wall.

Step-by-step guide to compliance over 18m

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

'Relevant building' under Regulation 7?

Regulation 7:

"Relevant building" means a building with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level and which:

i. contains one or more dwellings;

ii. contains an institution; or

iii. contains a room for residential purposes (excluding any room is a hostel, hotel or boarding house)

YES

All external wall materials to be A1 or A2-s1, d0

A restricted number of building materials are exempted

NO

Insulation: A2-s3, d2
Cladding: B-s3, d2

C-s3, d2 cladding permitted for some boundary conditions

Fire performance test to BS 8414-1 or BS 8414-2, assessed to BR 135

Any deviations or product substitutions from that which was tested are strictly subject to BS 9414

Compliance without compromise

Designing out risk

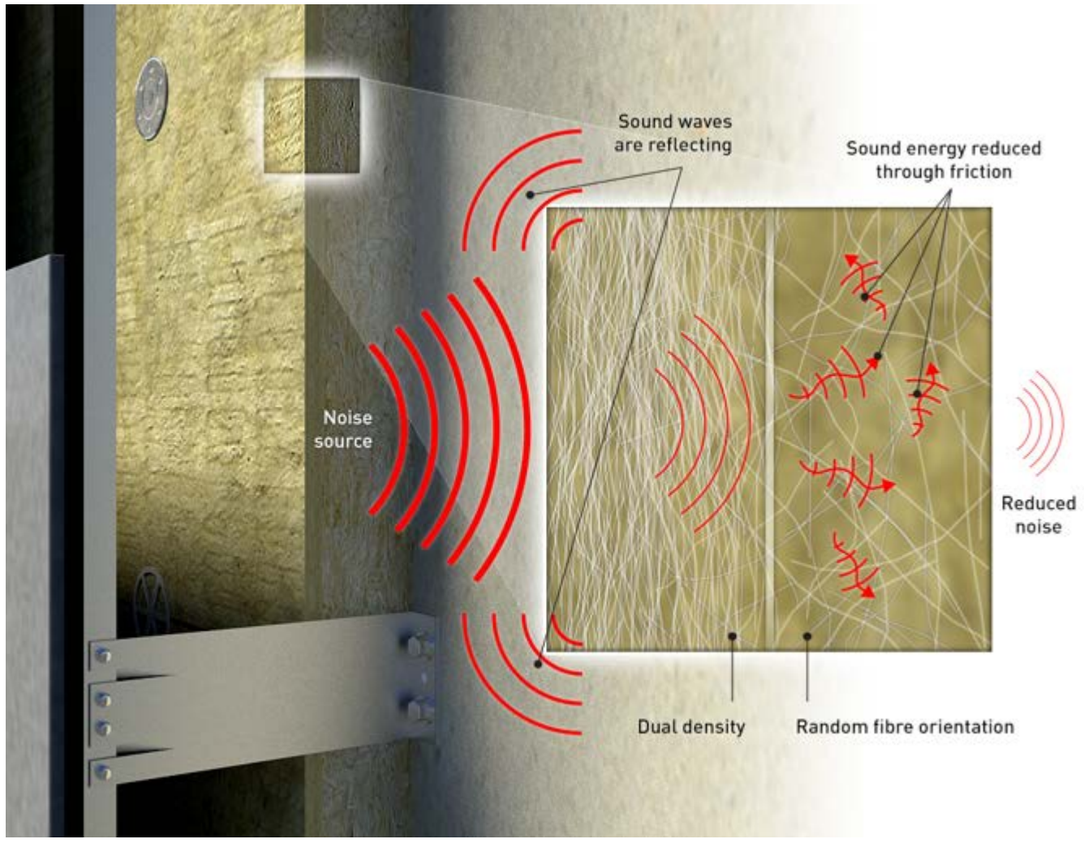
We believe that using non-combustible building products wherever possible is the most straightforward way of designing out risk and ultimately meeting the requirements of Building Regulations.

ROCKWOOL RAINSCREEN DUO SLAB® is non-combustible. It is classified A1 in accordance with BS EN 13501-1, the highest possible reaction to fire classification.

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

- Patented Dual-Density technology
- Pliable fit which results in fewer gaps and reduced thermal bridging
- Improved acoustic performance

Non-combustible ROCKWOOL insulation can help to provide a compliant solution for non-ventilated cladding systems that are specified for use above 18 metres.



ROCKWOOL rainscreen products

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

ROCKWOOL STEEL FRAME SLAB

- Low thermal conductivity of 0.034 W/mK
- Euroclass A1

ROCKWOOL SP Firestop OSCB

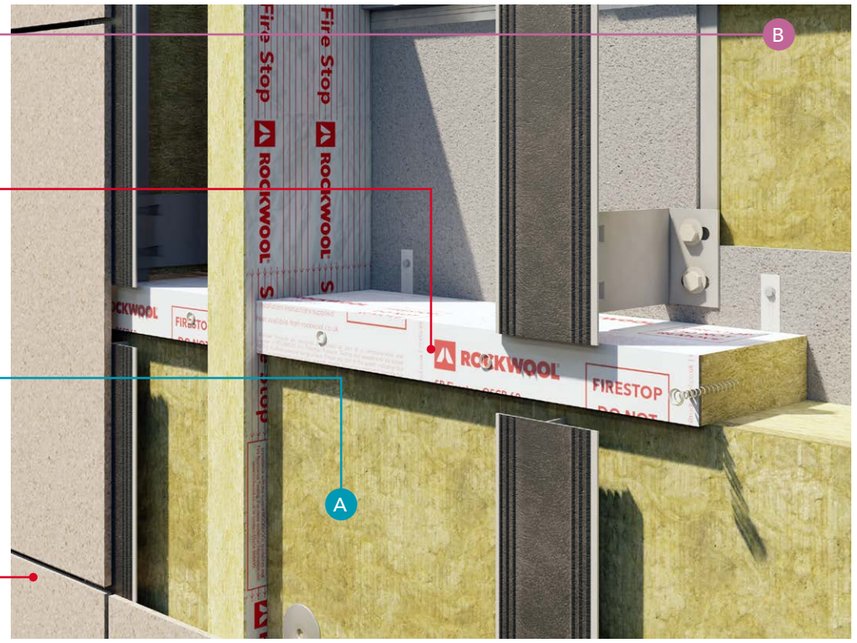
- Tested to ASFP TGD 19 for use with RAINSCREEN DUO SLAB®
- Up to 120 minutes fire integrity and insulation

ROCKWOOL RAINSCREEN DUO SLAB®

- BBA approved
- Dual-Density technology
- Easily pliable around brackets to reduce thermal bridging

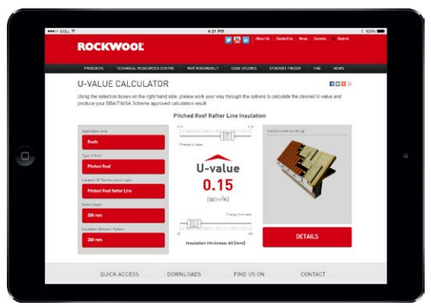
Rockpanel® Rockclad FS-Xtra

- Euroclass A2



A RAINSCREEN DUO SLAB® Thickness (mm)	B STEEL FRAME SLAB Thickness (mm)	U-value W/m²K
75	100	0.27
100	100	0.24
125	100	0.22
150	100	0.20
180	100	0.18

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



Online calculation tools

Go to our website to access the latest ROCKWOOL acoustic and U-value calculation tools, incorporating BIM.

www.rockwool.co.uk

Saving energy, improving lives

ROCKWOOL and Rockpanel® partner in award-winning Midlands development

Client:
Sandwell Metropolitan Borough Council

Main Contractor:
Keepmoat Regeneration

Location:
Smethwick

Building Use:
Residential flats

ROCKWOOL and Rockpanel® have joined forces in developing a high performance, fire resilient cladding project which has transformed three high-rise residential towers for Sandwell Borough Council.

The challenge

The Crofts in Smethwick consists of 270 homes within Ashcroft, Birchcroft and Elmcroft houses.

This development is located on a major arterial route into the city of Birmingham within a district that ranked 12th out of 326 in terms of deprivation in a 2010 study of the country. The three tower blocks, originally constructed in the 1960s, were in a universally poor condition, showing signs of major wear and tear to the building fabric, windows, roofing and balconies. In the absence of any wall insulation, they were also proving very difficult to heat and especially challenging to keep warm for those tenants living in fuel poverty.

Refurbishment at The Crofts also offered an opportunity for Sandwell Borough Council to rejuvenate not just these high-rise homes but also the wider area as they sought to bring a renewed sense of pride in their surroundings to residents and the local community.

The solution

This two year, £11 million project for specialist contractor, Keepmoat, has involved a dramatic, top-to-bottom renovation of each tower at The Crofts.

Substantial improvements have included flat-to-pitched roof conversions with solar panel installations, new windows and striking new balcony enclosures, redecorated communal areas, asbestos removal and the installation of a highly efficient and aesthetically attractive cladding solution, supplied by sister brands ROCKWOOL and Rockpanel®, featuring a non-combustible insulation.

ROCKWOOL RAINSCREEN DUO SLAB® is the non-combustible Dual-Density insulation board fitted at The Crofts. It incorporates patented Dual-Density technology specifically for application to this type of high rise development. Made from stone wool, ROCKWOOL RAINSCREEN DUO SLAB® achieves the highest A1 non-combustible fire rating. It also has the benefit of high resistance to wind and rain during construction, which, together with the minimal number of fixings required, makes installation quicker and easier for contractors. At The Crofts, the product has been tightly butt jointed, to deliver effective thermal insulation at 0.035 W/mK at the same time as it minimises any heat loss that could arise from gaps between insulation boards.

For the exterior cladding, Rockpanel FS-Xtra has been used to provide the attractive aesthetic finish on the project. Applied on top of an aluminium supporting structure and fixed with blind rivets, the Rockpanel 'FS-Xtra' boards meet the requirements for European fire class A2-s1,d0. The boards also weigh very little compared to other board materials and can be easily worked with on site, with no special tools required. This saves installation time and costs. Installed on this project by Astley Facades, Rockpanel FS-Xtra boards are available in a wide range of different finishes and colours. A mixture of vibrant Rockpanel Colours such as RAL 3009 and 5011 have been supplied at The Crofts.

The result

"I'm extremely proud of the work we have been able to do here at The Crofts," said Darren Cooper, leader of Sandwell Borough Council. "These improvements have made a massive impact on both the internal and external appearance of the blocks, as well as the local skyline. And, the much improved insulation offered by the eye-catching cladding will help reduce fuel bills for tenants."

A huge uplift in energy performance will result from these improvements. In fact, Sandwell Borough Council estimates that, in total, approximately 9,600 tonnes of carbon will be saved every year.

The Crofts has picked up two awards for corporate social responsibility, including a Bronze in the 2015 International Corporate Social Responsibility Awards and a first prize in the Delivering Social Value category at the 2016 National Federation of Builders Awards.

Ultimately, the project has made a significant impact in the local community. These three tower blocks are not merely visibly transformed, more efficient residences, they are also beacons of hope for tenants and the community of Smethwick.

Notes

The ROCKWOOL Trademark

ROCKWOOL® - our trademark

The ROCKWOOL trademark was initially registered in Denmark as a logo mark back in 1936. In 1937, it was accompanied with a word mark registration; a registration which is now extended to more than 60 countries around the word.

The ROCKWOOL trademark is one of the largest assets in the ROCKWOOL Group, and thus well protected and defended by us throughout the world.

If you require permission to use the ROCKWOOL logo for your business, advertising or promotion. You must apply for a Trade Mark Usage Agreement. To apply, write to: marketcom@rockwool.com.

Trademarks

The following are registered trademarks of the ROCKWOOL Group:

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ROCKCLOSE®
RAINSCREEN DUO SLAB®
HARDROCK®
ROCKFLOOR®
FLEXI®
BEAMCLAD®
FIREPRO®

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May 2022

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Version 1.01 May 2022