

MIMA building safety guide

# insulated façades

## About MIMA

The Mineral Wool Insulation Manufacturers Association (MIMA) is the industry trade body for non-combustible, breathable insulation and provides an authoritative source of independent information and advice on glass and stone wool insulation. MIMA actively promotes the benefits of mineral wool insulation and the contribution it makes to the energy efficiency of buildings and to the comfort and well-being of their occupants.

For further information please contact MIMA's Executive Director, Sarah Kostense-Winterton at [sarah@mima.info](mailto:sarah@mima.info) or visit MIMA's website at <http://mima.info>

---

## About this guide

This guide is applicable to the assessment and design of insulation and/or cladding systems applied to the exterior of all buildings having more than three storeys above ground level.

In the wake of the tragedy at Grenfell Tower, building owners have been seeking support in assessing the safety of their buildings. This guide provides information in respect to building façades, and includes details of A1 and A2 Euroclass rated non-combustible façade materials which meet the highest standards of performance in relation to fire whilst also delivering on energy efficiency.

Whilst guidance for building owners on fire has concentrated on high-rise domestic buildings, this guidance recommends that all mid- and high-rise (ie. 12m+) buildings should be reviewed, as well as all sensitive and high occupancy buildings such as hospitals, schools, hotels and sports arenas, regardless of their height.

Additionally, whilst this guidance focusses on building façades, the guidance it offers is also relevant to other building aspects such as flat roofs and cavities which contain insulation materials.

For further details of the guidance, please visit MIMA's website at <http://mima.info/info-centre/news/>

---

## About MCRMA

The MCRMA brings together the UK's leading roofing and cladding providers who have delivered to the majority of the industry's most prestigious buildings creating imaginative and innovative building designs that offer cost-effective and sustainable solutions which will benefit future generations.

The MCRMA represents and promotes the interests of systems manufacturers, component manufacturers, independent roofing and cladding inspectors and industry support services companies who provide products, systems and services within the non-domestic metal roof and wall market sector.

For further information please visit: <http://mcrma.co.uk> or for the MCRMA guidance visit: <http://mcrma.co.uk/wp-content/uploads/2017/11/Advice-Note-No-3.-4-page-ACM-Facade-Systems.pdf>

## MIMA position

- 1 Only A1 or A2 Euroclass products can ever offer certainty to occupants that the façade will offer the maximum protection against external spread of fire. All other routes (including large-scale testing of combustible materials) permit human error or judgement into the system. As such, MIMA advises the use of A1 and A2 cladding and insulation materials only, for the façades of mid- and high-rise, sensitive and high occupancy buildings.
- 2 The Euroclass system should be the only fire classification system referenced in building regulations and guidance. All reference to the British Standards derived 'Class 0' should be removed as this adds ambiguity – indeed many report a belief that Class 0 classification is synonymous with 'non-combustible', which it is not. Building owners should refer to the Euroclass system for information on material combustibility – further information on this can be found in the Q&A section.
- 3 Many industry experts including MIMA believe that the BS8414 large-scale façade test, which is required to test systems involving combustible materials such as insulation and cladding, has several limitations.
  - In particular, it should be updated to reflect real life construction features such as windows and vents.
  - Under test conditions, materials are fitted with extreme care and precision. As a Building Safety Programme update from MHCLG (previously DCLG), dated 5th September 2017 states in relation to the real-life application of façade systems; "it is important to note that materials may have been fitted or maintained differently, to how the tests were specified and constructed, which can affect the safety of the cladding system. Fixing details and the provision of cavity barriers are also important".<sup>1</sup>
  - As such, test results based on perfect laboratory conditions have significant limitations in terms of predicting real life performance.
- 4 In many European countries, such as France and Germany, large-scale tests are only used to assess the suitability of materials for low-rise buildings. This is because regulations stipulate that for high-rise building façades, combustible materials (Euroclass B-F) are simply not permitted. MIMA supports following this approach across the UK.
- 5 Given the fatal dangers of toxic smoke, MIMA believes material testing and classification should be introduced for smoke toxicity. Products must then be labelled and regulated accordingly.

## Government guidance

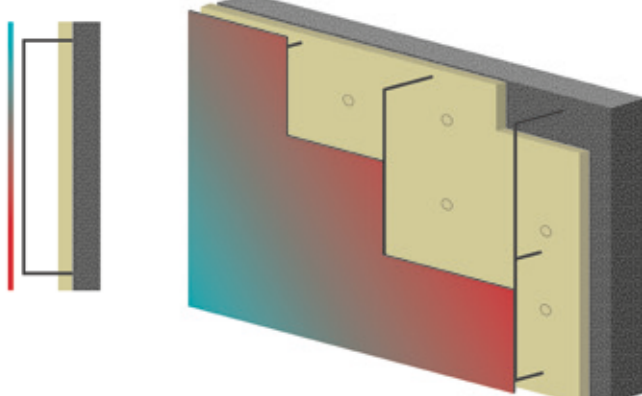
The Ministry of Housing, Communities and Local Government (MHCLG, previously DCLG) has produced a series of guidance notes<sup>2</sup> for building owners since June 2017. These notes have included information on:

### Assessing the materials on buildings:






- For a cladding system, often referred to in the building industry as a rainscreen system, this includes both the exterior cladding and the underlying insulation which form the primary aspects of the system. As noted in guidance produced by the MHCLG Building Safety programme, both the cladding and the insulation in this type of system can comprise combustible or non-combustible materials.
- For a rendered or brick finish system with no ventilated cavity, often known as an External Wall Insulation (EWI) system, the insulation layer can similarly comprise combustible or non-combustible materials.

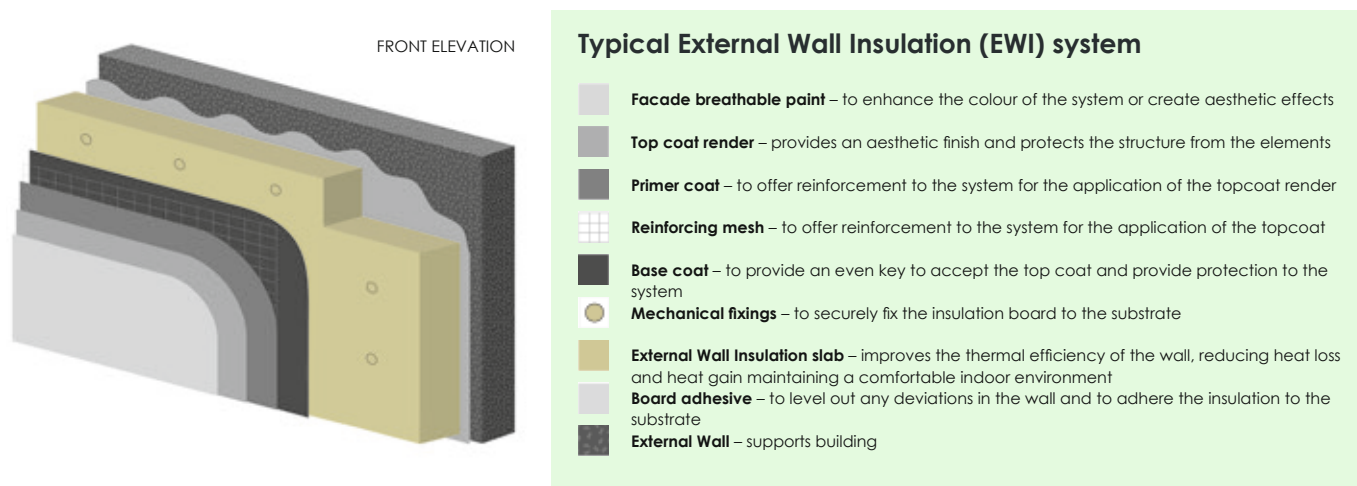
END ELEVATION

FRONT ELEVATION



### Typical rainscreen system

-  **Cladding panel** – protects other elements from weather
-  **Insulation** – helps regulate the temperature of the building, and retain heat
-  **Bracket and rails** – hold cladding in place
-  **External wall** – supports building
-  **Ventilated air cavity** – provides extra barrier to weather ingress, and allows water to drain without affecting building



### Assessing the compliance of the materials used:

- The Building Regulations for England stipulate that external walls must adequately resist the spread of fire.
- In Advice Note 14<sup>3</sup>, issued on 11th December, the Expert Panel set up by MHCLG states “the clearest ways of ensuring an external wall system adequately resists external fire spread are to use materials either of limited combustibility, or an external wall system which can be shown to have passed a large scale test conducted to the BS 8414 standard”.

Further guidance in Advice Note 14 regarding BS 8414 tests includes: “Building owners with BS 8414 tested external wall systems should seek professional advice on whether the external wall system has been installed and maintained as recommended by the manufacturer/supplier. For example, missing or incorrectly fitted cavity barriers, or damaged render can compromise the fire performance of an external wall system.”

### Undertaking remedial works:

- In their guidance note of 2nd August<sup>4</sup>, MHCLG stated that “An obvious option to ensure that the cladding system adequately resists external fire spread, is to replace the system with one where all of the elements of the wall are of limited combustibility”.

## Industry guidance and recommendations

### Support for using non-combustible materials only

In line with MIMA’s position, several key parties have also recommended the use of non-combustible materials only on high rise and sensitive building façades. These include the Royal Institute for British Architects; the Association of British Insurers; the Metal Cladding and Roofing Manufacturers Association; the All-Party Parliamentary Group on Fire Safety and Rescue; and the Communities and Local Government Select Committee.

On 20th November 2017, the Metal Cladding and Roofing Manufacturers Association (MCRMA) published guidance<sup>5</sup>, stating that,

**“Guidelines are not legal requirements, and should be considered the minimum acceptable standards. The legal requirement is for buildings to adequately resist the spread of fire and therefore, common sense suggests the use of limited combustibility materials wherever reasonably possible. Furthermore, it is a great concern that to date there is no guidance to discourage highly combustible facades from being installed on buildings under 18m (such as a five storey blocks of flats).”**

<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/643281/Update\\_and\\_consolidated\\_advice\\_for\\_building\\_owners\\_following\\_large-scale\\_testing.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643281/Update_and_consolidated_advice_for_building_owners_following_large-scale_testing.pdf)

<sup>2</sup> <https://www.gov.uk/guidance/building-safety-programme>

<sup>3</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/666190/111217\\_Advice\\_note\\_-\\_Non-ACM\\_advice.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/666190/111217_Advice_note_-_Non-ACM_advice.pdf)

<sup>4</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/636394/Advice\\_for\\_building\\_owners\\_Large-scale\\_wall\\_system\\_test\\_with\\_ACM\\_with\\_unmodified\\_polyethylene\\_filler\\_with\\_stone\\_wool\\_insulation.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/636394/Advice_for_building_owners_Large-scale_wall_system_test_with_ACM_with_unmodified_polyethylene_filler_with_stone_wool_insulation.pdf)

<sup>5</sup> <http://mcrma.co.uk/wp-content/uploads/2017/11/Advice-Note-No-3.-1-page-ACM-Facade-Systems.pdf>



## Detailed building safety guidance

The MCRMA further issued the following advice to its members to be taken in conjunction with professional advice:

- 1 PE ACM (Polyethylene Aluminium Composite Material) should not be used for construction, internally or externally, at any height.
- 2 The overwhelming priority is to satisfy yourself that you have taken reasonable steps to ensure that the building adequately resists the spread of fire, not that you have followed the minimum requirements of the current guidance. A marginal cost benefit is not a reasonable justification for choosing a significantly more combustible product.
- 3 High Buildings ( $\geq 12\text{m}$ ) – the major elements of the external façade should comprise only limited combustibility materials (subject to items 7 and 8). These include the sheathing board (where used), the insulation, the mounting system and the external facing material. Thermal isolation pads and vapour membranes located between the sheathing board (or structure) and insulation are not included, but the total combustible energy content of minor components should not exceed  $20 \text{ MJ/m}^2$ . There are currently too many concerns regarding the BS 8414 test to confidently use it as the sole measure of fire safety of an 'as installed' system. The MCRMA is seeking further evidence on the robustness and predictability of BR 135 results when systems contain commonly found construction errors and variations such as wall penetrations.
- 4 Low Buildings ( $< 12\text{m}$ ) – having no limitation on the combustibility of low rise buildings (which often includes hotels, hospitals, schools) is not adequately preventing the spread of fire.
  - a) If combustible insulation is used, it should be Euroclass B or C and only used in conjunction with limited combustibility (A1 or A2) external facing material.
  - b) If combustible external facing material is used it should be Euroclass B (and used with class A1 or A2 insulation).
- 5 Toxicity – it is possible that in future, toxicity and smoke performance will be regulated. It is nevertheless common sense to choose materials with superior toxicity and smoke characteristics (i.e. 's2' or above).
- 6 'Limited Combustibility' – for the purposes of this guidance, also includes 'non-combustible'. Above 12m, limited combustibility external facing products that rely on bonding or adhesives for their mechanical integrity must prove their mechanical stability in a fire through the successful pass of a BS8414 test. This includes ACM material, non-mechanically fixed materials and sandwich panels.
- 7 Low melting point materials – care should be taken with materials such as zinc. Above 12m, the MCRMA would advise where a material is specified with a melting point below aluminium, that a BS 8414 test verifies the mechanical performance. Similarly, MCRMA advises against using an external facing material that has a significantly higher melting point than the mounting system (e.g. Corten on aluminium). There is a danger in such situations that the load bearing framework could disintegrate in a fire prior to the facing material, resulting in a catastrophic collapse of the entire façade.
- 8 Roofing – MCRMA reminds members that similar diligence should be shown when considering the fire performance of a roof.
- 9 Product Identification – missing or incorrect product marking was a major obstacle in the identification of materials following the Grenfell fire. Given the difficulties associated with identifying similar looking materials, MCRMA recommends that the installed major elements are traceable and identifiable (e.g. through visible markings or radio frequency (RFID) tags). This is not only good quality control practice but will also help building control inspectors check that the correct materials are being used during construction.

# Information on material combustibility

**Q: How do I know whether a material is combustible or not?**

**A:** The Euroclass system tests and classifies the reaction to fire of a building material. It provides the following ratings: A1, A2, B, C, D, E, F. Materials with an A1 and A2 rating do not burn or contribute to the spread of fire, whilst materials rated B-F are combustible. Products that have not been classified for reaction to fire are assigned NPD (no performance determined).

**Q: If a product is certified as Class 0, does that mean it is non-combustible?**

**A:** No. It cannot be determined from a Class 0 rating whether a product is non-combustible. A Class 0 rating provides limited information relating only to the spread of flame and the heat release characteristics of the surface of a product, not the entire product.

## Euroclass EN13501-01 / Reaction to Fire (RtF)

England & Wales Definitions	Euroclass	COMBUSTIBLE	Euroclasses ✓ Ignitability ✓ Flame spread ✓ Total heat release ✓ Emission of toxic smoke ✓ Character changes e.g. melting, dripping, charring
Non-Combustible	A1		
Limited-Combustibility	A2		
	B		
	C		
	D		
	E		
	F		
No Performance Determined	NPD		

## Class 0

- ✗ Ignitability
- ✗ Flame spread →
- ✗ Total heat release
- ✗ Emission of toxic smoke
- ✗ Character changes e.g. melting, dripping, charring

Class 0 is not a measurement of a product's combustibility

Many insulation and cladding products achieve Class 0 but have a Euroclass rating of C or worse

**Q: What are “materials of limited combustibility”?**

**A:** In England, materials classified as A2 under the Euroclass reaction to fire system are termed “materials of limited combustibility”. However, in many countries including Scotland, both A1 and A2 materials are termed “non-combustible”. Whilst the language attributed to these classifications varies across countries, the testing regime and requirements needed to meet A1 and A2 standards is the same. All materials classified as A1 and A2 will not burn, will not contribute to the spread of fire and will not give off significant toxic smoke.

**Q: How do I know if a material is A1 or A2 rated?**

**A:** Information on a product's Euroclass rating must be made available on a mandatory Declaration of Performance (DOP) certificate. Most manufacturers publish product DOPs online, or alternatively they must make them available upon request.

**Q: What options are there in terms of A1 rated insulation?**

**A:** Stone wool and glass wool insulation (collectively known as mineral wool) is A1 certified. Mineral wool insulation can deliver the highest levels of thermal performance as well as acoustic benefits. There are several major manufacturers of stone and glass wool in the UK with a wide range of products available for domestic and non-domestic buildings.

**Q: Can a large-scale fire test guarantee the safety of a façade system?**

**A:** No. As stated in Advice Note 14 published by MHCLG on 11th December 2017,

*“Building owners with BS 8414 tested external wall systems should seek professional advice on whether the external wall system has been installed and maintained as recommended by the manufacturer/supplier. For example, missing or incorrectly fitted cavity barriers, or damaged render can compromise the fire performance of an external wall system.”<sup>6</sup>*

In addition, the BS8414 full-scale façade test has several limitations, including the lack of real life construction features such as windows and vents.

**Q: I've heard that even so-called 'non-combustible' materials actually burn. Is this true?**

**A:** No. Materials with an A1 and A2 Euroclass rating do not burn or contribute to the spread of fire.

**Q: If a product is certified as A1 or A2, does it emit toxic smoke in a fire?**

Products certified as Euroclass A1 and A2 do not emit any significant levels of toxic smoke in a fire. Combustible materials, on the other hand, can emit significant and thick toxic smoke when they burn.

<sup>6</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/666190/111217\\_Advice\\_note\\_-\\_Non-ACM\\_advice.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/666190/111217_Advice_note_-_Non-ACM_advice.pdf)