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A comparison of approaches regarding a ban on the use of combustible cladding materials

1 Introduction

This briefing paper has been prepared on behalf of the Committee for Finance to assist in its scrutiny of proposals to amend the Building (Amendment) Regulations (Northern Ireland) 2020. The paper seeks to provide a comparative overview of approaches taken to the banning of combustible material on external walls of applicable buildings across the UK.

2 Overview

On 14 June 2017, a fire took place at Grenfell Tower in London in which 72 people tragically lost their lives. The fire started on the fourth floor and rapidly spread throughout the building. The building was constructed of reinforced concrete with an external cladding system comprising insulation boards with aluminium composite material (ACM) rainscreen panels. The rainscreen panels contained a polyethylene

core. Polyethylene is a highly combustible substance. The material from which most of the insulation boards were made, polyisocyanurate foam, is also combustible¹.

The phase one report of the public inquiry into the fire at Grenfell Tower concluded that the main reason for the spread of the fire was the ACM cladding used on the exterior of the building and the insulation boards to which they adhered.

Since the events at Grenfell Tower, the UK Government and various of the devolved administrations have sought to change Building Regulations and associated guidance to ban the use of combustible materials in the cladding of high rise buildings. This paper summarises the various positions adopted on the use of cladding.

While regulations and associated guidance have now been amended in England, Scotland and Wales, and have been consulted on in Northern Ireland, further developments are ongoing throughout the UK regarding issues such as the roles and responsibilities of those designing, constructing and managing buildings, and wider considerations relating to fire safety.

3 The proposed regulations for Northern Ireland

Under the current proposals regarding Building (Amendment) Regulations (Northern Ireland) 2020, materials which become part of an external wall (or 'specified attachment') would have to be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1: 2018. This would amend Technical Booklet B (Materials and workmanship) and *Technical Booklet E – Fire Safety* (TBE).

These changes to Building Regulations are similar to those already introduced in England and Wales which ban combustible materials in cladding altogether.

The proposals also intend,

...to tighten up on the use of AILOTs (Assessments in Lieu of Tests) and ensure that they are only used where appropriate, with sufficient relevant test evidence and that they are undertaken by competent staff within appropriately certified organisations².

Section 1.11 of TBE sets out in greater detail what is permissible and what is not regarding the use of assessments in lieu of test.

¹ Grenfell Tower Inquiry. Phase One Report. Volume One: page 3: <https://assets.grenfelltowerinquiry.org.uk/GTI%20-%20Phase%201%20full%20report%20-%20volume%201.pdf>

² Department of Finance. 14.8.20. Building (Amendment) Regulations (Northern Ireland) 2020. Public consultation Document C.1: 'Dear Consultee letter': <https://www.finance-ni.gov.uk/sites/default/files/consultations/dfp/Dear%20Consultee%20Letter.pdf>

What do these terms mean?

BS EN 13501-1 defines the classes A1 and A2 as follows:	
Class A1	Will not contribute in any stage of the fire, including the fully developed fire
Class A2	Will not significantly contribute to the fire load and fire growth in a fully developed fire

The characteristics 's' and 'd' are defined as follows:	
s1	Weak or no smoke
s2	Medium smoke
s3	High smoke
d0	No dripping at all
d1	Slow dripping recorded
d2	High dripping recorded

The proposed changes would apply to:

- Buildings with a floor 18m high above ground level which contain a dwelling, contain an institution or contain a room for residential purposes. This will mean that flats, student accommodation, care homes, nursing homes, sheltered housing, hospitals and dormitories in boarding schools, all with a floor over 18m above ground level will be covered by the ban;
- Newly erected buildings or when there is a material change of use, alterations or extensions (as defined in building regulations) to an existing building. All elements of the external wall will be covered by the ban; including specified attachments (balconies, solar panels and sun shading devices). A list of exemptions from the ban for certain components will also be given.

4 Action by the UK Government

The UK Government introduced a ban on combustible materials for England in December 2018³. More precisely, this means that materials which become part of an external wall (or 'specified attachment') must be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1:2007+A1:2009⁴.

³ [Building \(Amendment\) Regulations, SI 2018/1230](#)

⁴ For more detail on these classifications, see See Lane, B. 2018. [Phase 1 Report - Appendix F. Reaction to fire tests and classifications](#). Grenfell Tower - fire safety investigation; also *UK Government. Fire safety: Approved Document B: <https://www.gov.uk/government/publications/fire-safety-approved-document-b>* and also British Standard. BS EN 13501-

The ban applies to buildings over 18m above ground level, which:

- Contain one or more dwellings;
- Contain an institution (including residential schools, care homes and hospitals, sheltered accommodation, student residences); or
- Contain a room for residential purposes but does not include a room in a hostel, hotel or boarding house.

Hotels and office buildings are to be exempt due to their different evacuation strategies and lower risks. The ban applies to new buildings and to refurbishment work where the external wall is involved.

The Grenfell Inquiry⁵, established on 15 August 2017, continues to examine the issues around the fire. Phase 1 focused on the factual narrative of the events on the night of 14 June 2017. This phase has concluded and the report was published on 30 October 2019. Phase 2 of the Inquiry, currently ongoing, examines the causes of these events, including how Grenfell Tower came to be in a condition which allowed the fire to spread in the way identified by Phase 1.

5 Action by the devolved administrations

5.1 Wales

In Wales, the Building (Amendment) (Wales) Regulations 2019 No. 1499 (W. 275)⁶ came into force on 13 January 2020. Similar to the approach taken in England, these regulations ban the use of combustible materials in cladding systems. The ban applies to the complete wall assembly and certain attachments to the external wall, including balconies and solar panels.

All materials which become part of an external wall (or 'specified attachment') must be of European Classification A2-s1, d0 or Class A1.

The changes to regulations in Wales are very similar to those introduced in England. Just one difference is evident: in England, a 'specified attachment' means (i) a balcony attached to an external wall; or (ii) a solar panel attached to an external wall. In Wales, the regulation adds 'a device for reducing heat gain within a building by deflecting sunlight which is attached to an external wall'.

1:2007 +A1:2009: *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*. Brussels: European Committee for Standardization.

⁵ Grenfell Tower Inquiry. Phase One Report. Volume One: page 3: <https://assets.grenfelltowerinquiry.org.uk/GTI%20-%20Phase%201%20full%20report%20-%20volume%201.pdf> using data from reaction to fire tests. Brussels: European Committee for Standardization.

⁵ Grenfell Tower Inquiry. Phase One Report. Volume One: page 3: <https://assets.grenfelltowerinquiry.org.uk/GTI%20-%20Phase%201%20full%20report%20-%20volume%201.pdf>

⁶ [The Building \(Amendment\) \(Wales\) Regulations 2019 No. 1499 \(W. 275\)](#)

5.2 Scotland

In Scotland, a somewhat different approach has been taken to the issue of flammable cladding. There is no outright ban on the use of combustible cladding on high rise buildings. The Technical Handbook, which was updated in October 2019, states that insulation and cladding materials on the outside of buildings should *either* be non-combustible (Euroclass A1 or A2) *or*, if the system incorporates combustible materials, the façade system should undergo a BS 8414 test⁷. The Technical Handbook states the following⁸:

Storey height more than 11m – *Where the building has a storey at a height of more than 11m above the ground the external wall cladding system should be constructed of products achieving European Classification A1 or A2.*

Alternative guidance – *BR 135, ‘Fire Performance of external thermal insulation for walls of multi-storey buildings’ and BS 8414: Part 1: 2015+A1: 2017 or BS 8414: Part 2: 2015+A1: 2017 provides guidance on fire spread on external wall cladding systems. The guidance provided in these publications may be used as an alternative to European Classification A1 or A2 external wall cladding and for European Classification A1 and A2 products exposed in a cavity. BS 9414: 2019 (Draft June 2019) provides additional information on the application of results from BS 8414 tests.*

This means that materials must either be non-combustible in themselves **or combustible materials can be used as long as the system as a whole has been tested and shown to be safe using a BS 8414 test**⁹.

This approach is not the same as that now adopted in England and Wales, where **any** components of the cladding or insulation materials must be of a non-flammable type.

The BS 8414 test is designed to provide data to enable evaluation of the fire performance of a complete cladding system, as opposed to the performance of

⁷ See [BS 8414-1:2015+A1:2017](#) which relates to the test method for cladding systems applied to the masonry face of a building and [BS 8414-2:2015](#) which relates to the test for external cladding systems fixed to and supported by a structural steel frame.

⁸ Scottish Government. *Building Standards Technical Handbook 2019: Domestic. Standard 2.7: Spread on external walls*: <https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/2-fire/2-7-spread-external-walls/>; these changes apply where Building Regulations apply (ie Building Regulations apply to new building work, such as the erection of a new block of flats, extension of an existing block, buildings being converted to flats or alterations to the building) <https://www.gov.scot/publications/practical-fire-safety-guidance-existing-high-rise-domestic-buildings/pages/8/> (see paragraph 283).

⁹ BS 8414 is a standard which relates to fire performance of external cladding systems; British Standard (BS) publications are technical specifications or practices that can be used as guidance for the creation of a product, carrying out a process or providing a service. Such standards are produced by the British Standards Institution which is the UK National Standards Body. It publishes standards and provides a range of books, self-assessment tools, conferences and training services. It also represents UK economic and social interests in European and international standards organisations.

individual elements. It is designed to test a cladding system, but not necessarily one which perfectly replicates a specific, individual building; it does not, therefore, include features such as additional windows, balconies or other elements¹⁰.

The Scottish Government has stated that assessments in lieu of a BS 8414 test should not be used¹¹:

Guidance to the Building Standards system in Scotland does not recognise the use of "comparative desk top studies" to assess the fire performance of the cladding system¹².

However, this does not mean that assessments in lieu of test are necessarily illegal. In terms of the legal standing of text supplied in a Technical Handbook, the Scottish Government states that the handbook provides 'guidance on achieving the standards set in the Building (Scotland) Regulations 2004'¹³. The Technical Handbook is designed to assist with compliance but is not, in itself, a legal text:

The principal supporting guidance documents are the Technical Handbooks for domestic and non-domestic buildings. Following the guidance in the Handbooks is the usual route to compliance and may be relied on in any legal dispute as 'tending to negate liability' for an alleged contravention of building regulations. Alternative means of compliance is possible and the verifier has the power to decide whether or not alternative solutions fulfil the mandatory functional standards¹⁴.

Desktop tests can still be used in Scotland. At a meeting of the Scottish Parliament Local Government and Communities Committee, the Chair of the Review Panel on Building Standards (Fire Safety) in Scotland, Dr Paul Stollard, stated that:

On the extrapolation of desktop exercises, in Scotland, we allow verifiers to choose to depart from the basic guidance and to accept variations if the verifier is competent to do that...¹⁵

A range of views have been expressed regarding the approach adopted towards cladding materials in Scotland.

¹⁰ BS 8414-1:2020: page 1.

¹¹ Desktop studies, or 'assessments in lieu of test', involve specialists providing an opinion on whether a façade system would pass a BS 8414 test based on the results for a comparable, but not necessarily identical, system.

¹² Scottish Government. 30.8.17. ACM Cladding in Scotland: Questions and answers: <https://www.gov.scot/publications/grenfell-responding-in-scotland/>

¹³ Scottish Government. *Building Standards Technical Handbook 2019: Domestic. Standard 2.7: Spread on external walls:*

<https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/2-fire/2-7-spread-external-walls/>

¹⁴ Scottish Government. 'External wall systems (version 3.0): draft advice note': <https://www.gov.scot/publications/draft-scottish-advice-note-external-wall-systems-version-3-0/pages/1/> Page accessed on 6.1.21.

¹⁵ Scottish Parliament Local Government and Communities Committee. 5.9.18: <https://www.parliament.scot/parliamentarybusiness/report.aspx?r=11645>

The Scottish Government review panel on building standards (fire safety) in Scotland recommended in June 2018 that,

BS8414 (and BR135¹⁶) would remain as an alternative method of providing evidence to show compliance.¹⁷

In the text of the report, the panel stated that, 'In this manner innovation would still be possible, but the onus and expense of proving compliance would lie with the design team'.¹⁸

However, in evidence submitted to the Scottish Parliament Local Government and Communities Committee, the company Rockwool stated that¹⁹:

Despite areas of strength and leadership within the Scottish Building Regulations, Scotland has become an outlier in the UK on one very significant point – there is no ban on the use of combustible cladding and insulation on high-rise and high-risk buildings.

A report submitted to the Grenfell Inquiry by Professor Torero, University College London, stated that:

Tests such as BS 8414 provide a single scenario deemed consistent with an external fire, a very limited number of measurements and a very simple failure criterion. The combination of these three characteristics does not provide a sufficiently comprehensive assessment of performance.²⁰

On 30 July 2020, the Scottish Government's Technical Working Group published a draft Advice Note on External Wall Systems. It was stated that the government was seeking views on this draft ahead of publishing a final Advice Note 'later in 2020'²¹. The draft states that the BS 8414 test can continue to be used as a means of testing the safety of an external cladding system, even where that system contains materials which do not conform to *European Classification A1 or A2*.

¹⁶ BRE (Building Research Establishment) is an independent, research-based consultancy; BR135 relates to 'Fire performance of external thermal insulation for walls of multistorey buildings'; it 'sets out principles, design methodologies and fire spread performance characteristics for non-loadbearing cladding systems'. See Designing Buildings Wiki: [https://www.designingbuildings.co.uk/wiki/Fire_performance_of_external_thermal_insulation_for_walls_of_multistorey_buildings_third_edition_\(BR_135\)](https://www.designingbuildings.co.uk/wiki/Fire_performance_of_external_thermal_insulation_for_walls_of_multistorey_buildings_third_edition_(BR_135)); whereas BS 8414 specifies the details of the test method to be used (such as the duration of the test, the placement of thermocouples, the fuel requirements etc), BR135 sets out the performance criteria for each of the different material types available (thermoplastics, thermoset products etc).

¹⁷ Scottish Government. June 2018. [Report of the Review Panel on Building Standards \(Fire Safety\) in Scotland](#): page 14.

¹⁸ As above.

¹⁹ Rockwool. 2019. Briefing for the Local Government and Communities Committee: Building Regulations and fire safety: one-off evidence session with focus on new homes and owner-occupiers (20 November 2019): https://www.parliament.scot/S5_Local_Gov/ROCKWOOL_briefing_for_LGC_Committee_Nov_19.pdf

²⁰ Grenfell Tower Inquiry. 23.5.18. *Professor José L Torero Expert Report*: <https://www.grenfelltowerinquiry.org.uk/evidence/professor-jose-l-toreros-expert-report>

²¹ Scottish Government. 30.7.20. External wall systems (version 3.0): draft advice note: <https://www.gov.scot/publications/draft-scottish-advice-note-external-wall-systems-version-3-0/> Page last consulted on 11.1.21.

Some external wall systems may incorporate insulation products, combustible core/filler material, etc. which do not meet Class A2-s3,d2 or better (previously referred to as 'limited combustibility') and has achieved the BR 135 performance criteria following a BS 8414 test. External wall systems rely upon correct design detailing and construction of cavity barriers, fire stopping and in some cases external renders to inhibit fire spread. Building owners should seek professional advice on whether the external wall has been installed correctly, as per the BS 8414 test, and that the BS 8414 result is fully applicable to the building in question. It should be subject to maintenance in line with manufacturer/supplier recommendations.

Annex 1: A summary of approaches to combustible cladding materials

	England	Scotland	Wales	Northern Ireland
Date of change	21 December 2018	October 2019	13 January 2020	At proposal stage; consultation closed on 9 October 2020.
Nature of materials banned	<p>In England, a ban was introduced on combustible materials in December 2018²².</p> <p>Materials which become part of an external wall (or 'specified attachment') must be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1:2007+A1:2009.</p>	<p>In Scotland, there is no ban on the use of combustible cladding on high rise buildings.</p> <p>The Technical Handbook states that insulation and cladding materials on the outside of buildings should either be²³:</p> <ul style="list-style-type: none"> ▪ Constructed of products achieving European Classification A1 or A2, or ▪ Alternative guidance – tests BR 135 and BS8414 may be used as an alternative. 	<p>Bans the use of combustible materials in cladding systems²⁴. Applies to the complete wall assembly and certain attachments to the external wall, including balconies and solar panels.</p> <p>All materials which become part of an external wall (or 'specified attachment') must be of European Classification A2-s1, d0 or Class A1.</p>	<p>Materials which become part of an external wall (or 'specified attachment') must be of European Classification A2-s1, d0 or Class A1, classified in accordance with BS EN 13501-1: 2018.</p>
Buildings to which it applies	<p>Buildings over 18m above ground level, which:</p> <ul style="list-style-type: none"> ▪ Contain one or more dwellings; ▪ Contain an institution (including residential 	<p>Domestic and Non-Domestic buildings.</p> <p>Building Regulations apply to new building work, such as the erection of a new block of flats, extension of an existing block, buildings being</p>	<p>All new residential buildings (flats, student accommodation and care homes) and hospitals. Also applies to existing buildings where relevant building work is being carried out which falls within the scope of the Building Regulations, unless the</p>	<p>Newly erected buildings or when there is a material change of use, alterations or extensions (as defined in building regulations) to an existing building.</p>

²² [Building \(Amendment\) Regulations, SI 2018/1230](#)

²³ Building Standards Technical Handbook 2019: [Domestic. Standard 2.7: Spread on external walls](#)

²⁴ [The Building \(Amendment\) \(Wales\) Regulations 2019 No. 1499 \(W. 275\)](#)

	<p>schools, care homes and hospitals, sheltered accommodation, student residences); or</p> <ul style="list-style-type: none"> ▪ Contain a room for residential purposes but does not include a room in a hostel, hotel or boarding house. <p>Applies to new buildings and to refurbishment work where the external wall is involved.</p>	<p>converted to flats or alterations to the building.</p>	<p>building works have started on-site or an initial notice, building notice or full plans have been deposited and work has started on site within a period of 8 weeks.</p>	
Height to which it applies	<p>Buildings with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level.</p>	<p>Buildings with a storey at a height more than 11m above the ground.</p> <p>However, the Technical Handbook states that variations are possible:</p> <p><i>Designers are encouraged to seek early advice from the fire and rescue service if they wish to vary from the guidance where, for example, the façade is accessible to high reach appliances.²⁵</i></p>	<p>Buildings with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level.</p>	<p>Buildings with a floor 18m high above ground level.</p>
Situation regarding Assessments in Lieu of Tests (AILOTs) (otherwise referred to as a desktop study)	<p>Assessments in Lieu of Tests cannot be used in any circumstances for cladding and other external wall materials covered by the new ban on combustible materials.</p>	<p>The BS 8414 test also allows for an assessment in lieu of test; under this test, a consultant may provide an opinion on whether a façade system would pass a BS</p>	<p>This issue was consulted on by the Welsh Government in 2019; the government is currently reviewing responses.</p>	<p>Proposals include an amendment to Technical Booklet E to 'give more explicit guidance to the use of AILOTs', to ensure they are only used where appropriate, with sufficient relevant test evidence</p>

²⁵ Building Standards Technical Handbook 2019: [Non-Domestic. Standard 2.7: Spread on external walls](#)

	<p>Assessments should only be used where it is clearly impractical or not feasible to carry out tests (eg products which are too large to fit in a test furnace would first need to have been tested at a smaller scale to obtain data on actual performance before undertaking an assessment).²⁶</p>	<p>8414 test based on the result for another system.</p>		<p>and that they are undertaken by competent staff within appropriately certified organisations²⁷.</p>
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²⁶ UK Government. 2018. [Government Response to the Consultation on Amendments to Statutory Guidance on Assessments in Lieu of Tests in Approved Document B](#): page 20

²⁷ Department of Finance. August 2020. Building (Amendment) Regulations (Northern Ireland) 2020. Public consultation Document C.1. 'Dear Consultee' Letter.