



An Roinn Tithíochta, Pleanála agus Rialtais Áitiúil
Department of Housing, Planning and Local Government

Fire safety guidance note 01 of 2017

Assessing existing cladding systems in buildings of more than six storeys, or more than 18m in height

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An Stiúarthóireacht Náisiúnta um Bainistíocht Dóiteáin agus Éigeandála
National Directorate for Fire and Emergency Management

1. Introduction

Where a building-specific fire safety assessment is being carried out by / for the person having control over premises and/or their professional advisor(s), it should consider if the passive and active fire safety measures in the building, as well as management of fire safety in the premises, are to an appropriate standard, and commensurate with the use or occupancy of the premises.

This document provides guidance in respect of outer cladding of a wall construction with a drained and/or ventilated cavity, for consideration where fire safety assessments are carried out on existing buildings of more than six storeys, or more than 18m in height.

The guidance does not deal with curtain wall constructions, external wall insulation systems, or walls consisting of a sandwich panel, supported from a structural frame.

The guidance in this document will be of assistance to the person having control, in making provision for safety of life from fire, and in meeting the duty, set out in section 18(2) of the Fire Services Acts, 1981 and 2003.

Construction, characteristics, circumstances, and the use(s) to which buildings are put will vary between buildings, and each building will require specific consideration; the guidance in this document is intended to assist those carrying out, or reviewing, fire safety assessments of cladding systems.

2. Fire safety assessment

2.1 Fire safety assessment of a cladding system should be carried out by a competent person. In most cases, the person having control over the building should engage a professional advisor to carry out a fire safety assessment, where required (for example, where a fire safety assessment is required by a fire authority, under section 18(6) of the Fire Services Acts, 1981 and 2003).

2.2 In assessing the cladding system, the steps taken by the professional advisor should include:

- gathering available information in respect of the system, including design considerations, materials installed and their reaction to fire and fire propagation properties, any records or certification regarding the building or the cladding installation. This type of information may be available from:
 - designers of the building or the cladding,
 - cladding contractors,
 - suppliers or manufacturers of the cladding system or its components,
 - the building safety file,

- fire safety certificate application(s),
- fire safety certificate(s) granted, or,
- other sources.
- reviewing the available information on the cladding system, along with any published guidance, including the guidance in this document and other information or evidence regarding cladding systems and their performance in the case of fire.
- considering whether other steps, such as testing of a cladding system or component(s), are required, to provide further information or evidence,
- considering the potential for a fire involving the cladding system to spread rapidly within the building or to other premises,
- considering if immediate actions to improve fire safety in the building are warranted (see Appendix A),
- considering if remedial works to the cladding system are required,
- considering whether replacement of the cladding system, or elements of the cladding system, is required,
- considering whether other measures for fire safety, including management of fire safety, are required.

2.3 The professional advisor should provide a report to the person having control over the building. With regard to cladding or rain screen systems, the report should include:

- a description of the building and the use(s) of the building,
- a description of the cladding system in place on the building,
- information on any features of the building and/or the cladding system that are relevant to the fire safety assessment,
- a description of the information used in assessing the cladding system,
- information on the assessment method(s) used in the fire safety assessment,
- an account of the considerations and evidence taken into account in the fire safety assessment,
- the results and conclusions of the fire safety assessment,
- any recommendations made in respect of the cladding system,
- any recommendations for remedial works, and,
- any recommendations for interim or other fire safety measures, where required.

2.4 In considering the need for, and the extent of, any remedial works or other fire safety measures, the professional advisor should take account of the building construction and the use(s) to which the building is put. Requirement for remedial works may be greater in the case of buildings providing sleeping accommodation, or buildings habitually accommodating large numbers of people, than in the case of other buildings – for example, buildings of single storey construction, though more than 18m high, with low numbers of occupants.

3. Assessment methods

3.1 Assessment of cladding systems should include consideration of

- materials used in cladding, including the fire propagation properties of materials, and the combustibility of materials, including any core material in composite components,
- materials used in insulation, including their combustibility, and,
- provision of cavity barriers, including their location, fixings, and provisions to ensure their performance is not made ineffective.

For cladding systems in existing buildings, assessment may be made using an elemental method, considering the components of the cladding system, or using an assessment of the overall construction of the cladding system.

3.2 An elemental method should consider the components of the cladding system, and the guidance in *Technical Guidance Document B – fire safety* (2006) (TGD B (2006)). Reference may be made to relevant guidance, including in Section B3 and Section B4. In particular, reference may be made to sections 3.2.5.9, 3.3 (including 3.3.4(d)), 4.1.4, and 4.1.5.

3.3 An assessment of the overall construction of the cladding system should be made with reference to the Building Research Establishment publication BR135 *Fire Performance of External Thermal Insulation for Walls of Multistorey Buildings*, third edition (2013). BR135 provides information on mechanisms of fire spread, types of cladding systems, and design principles for cladding systems; it also sets out performance criteria for cladding systems when tested to

- British Standard BS 8414-1:2015 *Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems applied to the masonry face of a building, or*
- BS 8414-2:2005 *Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel structure.*

Alternatively, in cases where no fire specific test data exists for a particular cladding system, assessment may be made using a desktop study report from a competent person, stating whether, in their opinion, the BR135 criteria would be met with the system under assessment. The report should be supported by test data from a suitable accredited (for example, INAB or UKAS) testing body, and the cladding system should be sufficiently similar to systems tested to BS 8414. Some information on systems tested to BS 8414 is given at paragraphs 3.4 and 3.5. This option is of benefit only if the components of the cladding system have already been tested. The report should specifically refer to the tests which have been carried out on the components of the system under assessment.

3.4 As part of the UK Government's Building Safety Programme, a series of large scale tests (to BS 8414-1) was carried out, testing three types of aluminium composite material (ACM) cladding, with three commonly used types of insulation. Detailed reports of these tests are available online (<https://www.gov.uk/guidance/building-safety-programme#latest-advice-for-landlords-and-building-owners>), and may provide useful information for those undertaking fire safety assessments of cladding systems. Reference is made in this document to some of these tests; they are referred to using designations BRE test 1 – BRE test 7.

3.5 Additionally, the UK Government asked the Building Research Establishment and manufacturers of cladding systems to make available information regarding cladding systems that have met the BR 135 criteria when tested to BS 8414. Information regarding a number of tests is available online (<https://www.bre.co.uk/regulatory-testing>), and, again, may provide useful information for those undertaking fire safety assessments of cladding systems.

4. Cladding materials and assessment considerations

4.1 While each cladding system, including the combination of materials present, should be assessed, Table 1 gives general indications regarding combinations that may be found on existing buildings.

4.2 In the case of cavities in cladding systems, suitable cavity barriers should be in place, appropriately located. Guidance in respect of cavity barriers is given in TGD B (2006), section B3, 3.3. Note, in particular, 3.3.4(d), regarding the performance of cavity barriers.

4.3 Where an elemental method of assessment is used, external surfaces of panels, and internal surfaces facing a cavity, should meet the requirements of TGD B (2006), Table 4.1. Insulation material used in the drained and/or ventilated cavity should be of limited combustibility.

Table 1 Cladding system combinations					
PANELS					
INSULATION	Non-combustible (8)	Composite panels, with core material			
		Material of limited combustibility (9)	Combustible (calorific value ≤ 13.6 MJ/kg) (category 1 or category 2 (10))	Combustible (calorific value > 13.6 MJ/kg and ≤ 35 MJ/kg) (category 2 (10))	Combustible (calorific value > 35 MJ/kg) (category 3 (10))
Non-combustible (8)	Likely to be acceptable See note (2)	Likely to be acceptable See note (2)	May be acceptable. See note (4)	Assessment required. See note (6)	Assessment required. See note (6)
Material of limited combustibility (9)	Likely to be acceptable See note (2)	Likely to be acceptable See note (2)	Assessment required. See note (6)	Assessment required. See note (6)	Assessment required. See note (6)
Combustible (1)	Assessment required. See note (3)	Assessment required. See note (5)	Unlikely to be acceptable. May present a significant fire hazard. See note (7)		

- (1) Insulation that is not non-combustible, or is not composed of materials of limited combustibility, does not comply with the guidance at TGD B (2006), 4.1.5, third paragraph.
- (2) The professional advisor should consider if any remedial work is necessary to ensure the safety of the building. BRE test 6 may be relevant.
- (3) The professional advisor should consider the construction. Comparable constructions may have shown compliance with BR 135 criteria when tested to BS 8414. See 3.5, above.
- (4) The professional advisor should consider the construction. There may be limited evidence to support this type of construction. BRE test 4 may be relevant.
- (5) The professional advisor should consider the construction. There may be limited evidence to support this type of construction. BRE test 5 may be relevant.
- (6) The professional advisor should consider the construction, in light of current knowledge (for example, BRE test 4), including calorific value of panel core material. For higher calorific values, there may be a lack of evidence to support the fire safety of this type of construction in buildings in excess of 18m in height, with accommodation above the ground floor. (BRE test 2 may be relevant.) **In such cases, remedial work may be required** – see 2.4, above. The professional advisor should also consider interim fire safety measures to reduce the risk to building occupants from fire, pending completion of remedial work – see Appendix A. Where remedial work is not practicable, other fire safety measures may be considered, as an alternative – see Appendix B.
- (7) A cladding system incorporating combustible insulation and composite cladding with a combustible core is unlikely to be acceptable in buildings in excess of 18m in height, with accommodation above the ground floor. **In the absence of evidence to demonstrate that a particular system is acceptable, such systems may present a significant fire hazard on these buildings.** The professional advisor to the person having control over the building should consider remedial work, including replacement of the cladding system, or elements of the cladding system. The professional advisor should also consider interim fire safety measures to reduce the risk to building occupants from fire, pending completion of remedial work – see Appendix A. BRE tests 1,3 & 7 may be relevant.
- (8) See notes to Table A8, TGD B (2006) for definition of non-combustible materials.
- (9) See notes to Table A7, TGD B (2006) for definition of materials of limited combustibility.
- (10) EN ISO 1716:2010 *Determination of the gross heat of combustion (calorific value)*
category 1 – calorific value ≤ 3 MJ/kg
category 2 – calorific value > 3 MJ/kg and ≤ 35 MJ/kg
category 3 – calorific value > 35 MJ/kg.
For comparison, an average calorific value for soft and hard woods, with approximately 12% moisture content, is 18.6MJ/kg (source: Appendix III, Post-War Building Studies No. 20 (1946) *Fire Grading of Buildings, Part I, General Principles and Structural Precautions* – conversion from BThUs/lb).

4.4 Where cladding of a building poses, or is likely to pose, a serious risk to the safety of residents / occupants of the building, because of potential for rapid vertical or horizontal spread of fire, consideration must be given to moving residents / occupants out of the building until satisfactory remedial work, or other fire safety measures, have been undertaken.

5. Remedial work

Any remedial works should comply with the requirements of Building Regulations, including:

- structural safety,
- fire safety,
- resistance to moisture,
- materials and workmanship, and,
- conservation of fuel and energy.

See Appendix C.

As remedial works will be at least subject to the requirements of Part B (fire safety) of the Building Regulations, this would constitute a material alteration, and the works themselves should comply with all parts of the Regulations.

The Building Regulations also apply to every part of a building affected by works in connection with the material alteration, but only to the extent of prohibiting any works which would cause a new or greater contravention, in such buildings, of any of the Regulations. This provision does not require extra work to ensure compliance in other parts of the building, but prohibits material alterations that may cause greater non-compliance with the Regulations.

Such remedial works will generally require a fire safety certificate – refer to article 11 of the Building Control Regulations, 1997 - 2014. Where a fire safety certificate is required, the full requirements under the Building Control (Amendment) Regulations, 2014 – a commencement notice with accompanying documentation, design certifier, and assigned certifier – apply.

Appendix A

Interim fire safety measures

A1 Interim fire safety measures should be considered, for immediate implementation, pending completion of remedial works, where required.

Interim fire safety measures are more likely to be required in the case of buildings providing sleeping accommodation, or buildings habitually accommodating large numbers of people.

If the building is protected by an automatic sprinkler system (or an equivalent fire suppression system) and / or a suitable fire detection and alarm system, this may reduce the need for interim fire safety measures.

A2 Interim measures that may be considered could include the following:

- Ensure that emergency fire procedures for the building are in place and are made known to occupants. Ensure that notices in the building, providing information on emergency fire procedures, are accurate and up-to-date.
- Ensure that the building is equipped with a suitable fire detection and alarm system, and that it is operating correctly.
Where suitable fire detection and alarm is not in place, provision of a fire watch by appropriately trained patrolling security officers or wardens may be considered, pending provision of a fire detection and alarm system.
- Check at ground level, or on any balconies, to ensure that no combustible material (such as refuse) is in the vicinity of the cladding. Put measures in place to prevent combustible materials in such locations – for example, by using temporary barriers, or by issuing instructions to residents / occupants.
- Check that any smoke control system, as well as associated fire detection systems, is operating correctly.
- Check all facilities provided for the fire service, including fire fighting lifts and dry or wet rising mains.
- Ensure that there is sufficient access for fire service vehicles to the building, and, if necessary, issue instructions to residents / occupants to avoid parking cars or other obstruction on access routes.

- Facilitate visit(s) to the building, for the purpose of pre-incident planning, by fire services.
- Close car parks in which a vehicle fire could impinge on cladding.
- Physical measures should be put in place to ensure vehicles cannot be parked adjacent to cladding.

A3 Additionally, in the case of buildings containing flats, the following measures should be considered:

- Residents should be advised to ensure that smoke alarms are present and working in their flat.
- Residents should be advised to report concerns about fire safety, such as presence of combustible materials in escape routes, or concerns about safety of building services, to the building management.
- Check that all entrance doors to individual flats, and doors that open onto escape corridors and stairways, are fire resisting and effectively self-closing against any latch resistance. In the case of doors to plant rooms or cupboards, these may be locked shut. If non-fire-resisting doors are found where a fire resisting door is required, replace these with doorsets having the appropriate fire resistance. Guidance on fire resisting doors is given in Appendix B, TGD B (2006). In general, doors that were acceptable as fire resisting at the time of construction of the building will be satisfactory; they should, however, have self-closing devices, and close effectively against any latch resistance.
- Check all walls and floors that separate flats, plant rooms and store rooms, etc. from common escape routes, to ensure there is no obvious route for fire or smoke spread (for example, holes where services, such as pipes and cables, pass through walls).
- Residents should be advised that barbeques should not be used on balconies, or in the vicinity of cladding.

Appendix B

Fire safety measures

B1 In the case of buildings other than those providing sleeping accommodation, or buildings habitually accommodating large numbers of people, where remedial work, or replacement of a cladding system, is not practicable, alternative fire safety measures may be considered.

The practicability of remedial works should be considered on a case-by-case basis.

B2 Alternative measures to be considered should include:

- Ensuring that adequate means of egress are provided from the building, with suitable fire detection and alarm system, and emergency lighting system. Where suitable fire detection and alarm is not in place, provision of a fire watch by appropriately trained patrolling security officers or wardens may be considered, pending provision of a fire detection and alarm system.
- Provision of first aid fire fighting equipment.
- Ensuring that any smoke control system, as well as associated fire detection system, is operating correctly, and that systems are correctly maintained.
- Ensuring, where fire resisting doors are required, that doors in place are fire resisting and effectively self-closing against any latch resistance. If non-fire-resisting doors are found where a fire resisting door is required, replace these with doorsets having the appropriate fire resistance. Guidance on fire resisting doors is given in Appendix B, TGD B (2006).
In general, doors that were acceptable as fire resisting at the time of construction of the building will be satisfactory; they should, however, have self-closing devices, and close effectively against any latch resistance.
- Ensure that compartmentation (including compartment walls, compartment floors and cavity barriers) is adequate, and that all penetrations are suitably fire stopped.
- Ensuring that all facilities provided for the fire service, including fire fighting lifts and dry or wet rising mains, are operating correctly, and that they are correctly maintained.
- Ensuring that there is sufficient access for fire service vehicles to the building.

- Providing that emergency fire procedures for the building are in place and are made known to occupants, and that notices in the building, providing information on emergency fire procedures, are accurate and up-to-date.
- Putting measures in place to prevent combustible materials (such as refuse) in the vicinity of the building, at ground level or on balconies – for example, by using barriers, and/or by issuing instructions to occupants.
- Putting measures in place to address the potential for vehicle fires to spread to involve cladding – such as closing car parking spaces in which a vehicle fire could impinge on cladding, putting physical measures in place to ensure vehicles cannot be parked adjacent to cladding, and/or removal of cladding in the vicinity of car parks or parking spaces.
- Where applicable, advising residents that barbeques should not be used on balconies or in the vicinity of cladding.
- Ensuring that any power supply, lighting system, heating or ventilating system, in the building is not defective and is adequately maintained.
- Eliminating or reducing storage or use of flammable or explosive materials in the building.
- Ensuring a comprehensive fire safety management system is in place in the building, including arrangements for
 - management duties, and appointing a responsible person to take charge of a fire safety programme, to see that they are met,
 - fire prevention, including good housekeeping practices, periodic inspections, identification and elimination of fire hazards inside and outside the building, and application of safety rules,
 - staff training – what to do before and during an outbreak of fire or other emergency,
 - control of work on site,
 - fire and evacuation drills,
 - maintenance of escape routes,
 - inspection and maintenance of fire protection equipment,
 - assistance to fire services,
 - contingency planning,
 - record keeping, including details of the fire safety management system and fire safety programme, fire prevention, training, drills, escape routes, inspection & maintenance, assistance for fire services, as well as details in relation to cladding system(s),

remedial work, and any interim or alternative fire safety measures.

Information on management of fire safety in buildings is given in British Standard BS 9999:2017 *Fire safety in the design, management and use of buildings – Code of practice* – Section 4: Designing for the management of fire risk, and Section 9: Managing occupied buildings.

B3 Consideration may also be given to provision of an automatic fire sprinkler system in the building.

Appendix C

Guidance for remedial works

C1 Any remedial works should comply with the requirements of the Building Regulations. This Appendix outlines a non-exhaustive list of potential issues that should be considered in the context of the Building Regulations.

C2 Structural safety. Replacement cladding may be heavier than the existing system and cladding panels, or insulation materials may have a lower resistance to fixings pulling through than the original panels. Replacement insulation may be heavier, particularly if it can absorb water (for example, from rain during installation or rain penetration through the outer cladding). In addition, removal of the original panels may damage fixings, the fixing system, or the building substrate.

If fixings or a fixing system are to be reused, the original design and suitability for the new application should be checked. This should also include an assessment of resistance to wind loads. It should not be assumed that the original specification of fixings was adequate, as there is a risk that the original system was not designed or installed correctly. Fixings should be corrosion-resistant and of a material type which is appropriate for the local environment. Fixings should take account of the condition of the building substrate and performance in a fire.

Guidance on structural safety of external wall cladding is given in sub-section 3 of *Technical Guidance Document A Structure* (2012). The publication *Code of practice for the design and installation of anchors*, Health and Safety Authority (2010) provides practical guidance on the procedures for safe design and installation of anchors.

C3 Fire safety. The requirements of Part B of the Building Regulations will apply in respect of recladding, and guidance in Section B3 and B4 of TGD B (2006) applies.

In particular:

- External surfaces should meet the performance set out in 4.1.4 and Table 4.1.
- Surfaces of outer cladding which face a cavity should meet the performance set out in 4.1.5 and Table 1.
- Insulation material used in drained and / or ventilated cavities should meet the performance set out in 4.1.5.
- Cavity barriers should be provided in accordance with the guidance in Section B3 – note, in particular, 3.2.5.9, 3.3.2, 3.3.3, and 3.3.4.

Alternatively, cladding systems (including any necessary compartmentation and cavity barriers) shown to meet the BR 135 criteria when tested to BS 8414-1 or BS 8414-2 may be acceptable.

C4 Resistance to moisture. The building structure, insulation and cladding should be designed and installed to minimise risks from moisture. This includes ensuring that alterations to the cladding system protect the structure and substructure from rain penetration, and particular attention should be paid to coping, flashing and drainage details, to ensure that insulation material is not at risk of becoming wet, and that structural materials are not at risk of rot or corrosion.

Consideration also needs to be given to the risk of interstitial condensation within the wall / cladding structure, which can result from a change in fabric performance where alternative materials – particularly insulation – are substituted. Guidance is given in

- BRE Report 262 *Thermal Insulation: avoiding risks*, and,
- BS 5250 *Code of practice for the control of condensation in buildings*.

C5 Materials and workmanship. It should be noted that, under Part D of the Building Regulations, there is an overarching requirement that all works should be carried out using proper materials ... which are fit for the use for which they are intended and for the conditions in which they are to be used, to ensure compliance with the regulatory requirements as prescribed. Refer to *Technical Guidance Document D materials and workmanship* (2013).

C5 Conservation of fuel and energy. Where the existing insulation is removed and replaced by an alternative product, as part of remediation works, the *U-value* of the construction should meet the value specified for existing buildings in the relevant *Technical Guidance Document L conservation of fuel and energy*, or the *U-value* of the original construction, whichever is lower.

After the 1st January, 2019, where renovation works are more than 25% of the surface area of the building envelope, it may be subject to major renovation provisions (see section 2.3 of *Technical Guidance Document L Conservation of fuel and energy - Buildings other than dwellings* (2017)).

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