

Managing fire risk during cladding and insulation removal and replacement on high-rise buildings – guidance for inspectors

Open Government status

Open

Target audience

Construction inspectors, Construction B2s, Construction visiting officers

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Summary

This outlines the key fire risks to be managed by duty holders during the removal and replacement of insulation and cladding on high-rise buildings.

Introduction

This OG pulls together guidance, in the Appendix, to help inspectors understand fire risks associated with removal and replacement of cladding and/or insulation on high-rise buildings. It outlines responsibilities for dutyholders and the Appendix can be used as a leaflet to hand to them. The appendix has been updated in September 2021

The Building Safety Regulator (BSR) will regulate high-rise buildings. These are defined as buildings with 7 or more storeys or that are 18 metres or higher, and either:

- have at least 2 residential units
- are hospitals or care homes (during design and construction)

It supplements the guidance in *Fire in construction* HSG 168

(<http://www.hse.gov.uk/pubns/priced/hsg168.pdf>) by detailing the factors clients, designers and contractors should consider in relation to the removal and replacement of such external wall insulation and cladding systems to control fire risks during construction work.

The OG does not address the management of other construction H&S risks, such as safe work at height and public protection for which there is existing guidance on the HSE website (www.hse.gov.uk). However, it is important that appropriate means of access for work at height are used and part of that assessment must include consideration of the size and nature of any panels being removed or installed.

The latest information (August 2021) from Department for Levelling Up, Housing and Communities (DLUHC) - formerly Ministry of Housing, Communities and Local Government (MHCLG) says that there are 473 residential towers (>18m) that need to have aluminium

composite cladding replaced. There are no similar figures for high-rise buildings with other combustible cladding.

Action

The recladding of high-rise buildings requires significant refurbishment projects. These are likely to be notifiable to HSE by F10. Inspection of this work will be targeted locally.

Construction Sector will receive information from DLUHC setting out where the buildings are and where high-risk factors are present, including:

- *buildings with 7 or more storeys or that are 18 metres or higher, and either:*
 - *have at least 2 residential units*
 - *are hospitals or care homes (during design and construction)*
- where insulation is not the lower-risk mineral wool
- where external wall cladding is combustible

This information will then be passed to field teams as priorities for inspection.

Red concerns and issues identified by Fire and Rescue Services (FRS) should be dealt with in the normal way.

The aim of the work is to ensure that the project has been properly planned, resourced and executed by client, designers and contractors. A master case will be used to link the inspections and monitor contacts. Once a number of inspections have been undertaken we will then be able to target any poor performers.

Each project should be assessed to determine the risks and controls that are relevant. Fire risk during construction should be low provided a suitable and sufficient assessment of the risks is made and the controls identified are implemented and managed effectively. All such risks should be dealt with as normal during any inspection.

Inspectors should address any other health and safety risks in particular selection of suitable equipment for work at height, measures to prevent objects falling and manual handling.

Part of our agreement with DLUHC is for inspectors on site to also obtain information on the products being used in remediation – what type of cladding and insulation is being used (product name if possible and Building Regulations fire classification - is it A1 or A2-s1-d0). It would also be helpful to know whether they are doing broader remediation work such as replacing windows or internal works like fire doors, sprinklers etc. This information should be recorded as part of the COIN record and linked to the master case (see below) so that sector can extract and forward details to DLUHC .

Background

Following the Grenfell Tower fire, a major exercise took place to identify social sector buildings clad with Aluminium Composite Materials (ACM) and/or foam polymer insulation materials and/or any defective fire stopping. These buildings are most likely to need to have removal and recladding works undertaken. The removal and replacement of underlying insulation on such buildings will depend on its flammability or whether it is bonded to the outer metal sheet as a composite (sandwich) panel.

Inspectors should follow the requirements set out in the action section above, and apply the information in the Appendix at site visits.

Enforcement responsibility for general fire precautions (GFP) and process fire precautions (PFP)

GFPs are those applied to identify and control/mitigate a fire and include precautions such as fire detection and alarm systems, fire extinguishers and other firefighting equipment, and means of escape, etc.

Where the building remains occupied during construction work to the exterior, enforcement of GFP in relation to both the construction work and the building will be the responsibility of the local FRS (see Regulation 36 CDM 2015).

Experience suggests that many clients, designers and contractors do not have sufficient knowledge and understanding of how to undertake a suitable fire risk assessment and plan how the work is to be undertaken safely with a building still occupied. Given this and the split enforcement responsibility, then the strong recommendation is that wherever possible joint visits with the local FRS should be made to projects identified for inspection. It is important to note that these should be with the FRS fire safety officers rather than operational staff.

Where a joint visit is not possible and inspectors find concerns with the GFP then they will need to raise these with the local FRS.

HSE retains enforcement responsibility for process fire risks such as hot work, management of waste and use of flammable materials involved in the construction work. Cladding designers and principal contractors should plan the work to avoid or reduce/control these risks.

Where inspectors find concerns with the PFP they should deal with them as normal under CDM and other relevant legislation.

HSE is the enforcing authority for general fire precautions on all other construction sites.

Organisation

Targeting

Inspection of refurbishment work involving the recladding of high-rise buildings meeting the criteria set out in the Action section (above).

Timing

As notified.

Recording and reporting

Link inspection cases to a Fire Risk and Cladding Initiative **inspection master case; for 2021/22 this is 4682463.**

Further references

HSG 168 Fire Safety in Construction

The Department for Levelling Up, Housing and Communities (DLUHC) - formerly Ministry of Housing, Communities and Local Government (MHCLG) run the government Building Safety Programme and its website (<https://www.gov.uk/guidance/building-safety-programme>) provides additional useful links, including advice for building owners on what measures to take to make buildings with ACM cladding systems safe.

Contacts

Construction Division Sector Regulatory Support Unit

Appendix 1

HSE Operational Guidance

Managing fire risk during cladding and insulation removal and replacement on high-rise buildings

Introduction

HSE construction sector has produced this technical note to assist its regulatory staff undertaking interventions to cladding removal and replacement work.

It is also aimed at clients (building owners, landlords, managing agents etc), designers and contractors involved in the planning, management and removal/replacement of cladding. Clients in particular need to ensure the information in this note is followed and that there is suitable communication, co-ordination and co-operation between the parties mentioned to ensure that work can be undertaken safely.

Scope and purpose

Following the Grenfell Tower fire, a major exercise took place to identify residential buildings *with 7 or more storeys or that are 18 metres or higher, and either:*

- *have at least 2 residential units*
- *are hospitals or care homes (during design and construction)*

clad with Aluminium Composite Materials (ACM) and/or foam polymer insulation materials and/or other combustible external wall systems. These buildings are most likely to need removal and recladding works undertaken. The Building Regulations were amended in 2019 to require that external wall systems used on such buildings are from non-combustible materials (to European classification for fire performance A1 or A2-s1,d0).

Where decisions are made to remove and replace then this note supplements the guidance in *Fire in construction* HSG 168 (<http://www.hse.gov.uk/pubns/priced/hsg168.pdf>) by detailing the factors clients, designers and contractors should consider in relation to the removal and replacement of such external wall insulation and cladding systems to control fire risks during construction work. It is limited solely to those construction activities and does not relate in any way to completed buildings.

This note does not address the management of other construction H&S risks, such as safe work at height and public protection for which there is existing guidance on the HSE website (www.hse.gov.uk). However, it is important that appropriate means of access for work at height are used and part of that assessment must include consideration of the size and nature of any panels being removed or installed.

Each project should be assessed to determine the risks and controls that are relevant. Fire risk during construction (erection of scaffold or mast climbers, cladding and insulation removal and replacement, dismantling of scaffolding, etc.) should be low provided a suitable and sufficient assessment of the risks is made and the controls identified are implemented and managed effectively.

Design of replacement external wall insulation and cladding systems

Clients and designers of replacement systems should consider the construction fire risks arising from the choice of materials and installation method, and their mitigation, and ensure

that information on residual risk is provided. Examples include the specification of adhesives (flammability), layout of insulation panels (alignment of vertical joints and positioning of fire stops), and temporary conditions that might occur during the works (temporary loss of fire protection systems). It is also important to consider the appropriate design for fixings of replacement cladding systems, to ensure they are correctly installed and attached to the building.

Where existing external wall panels have been removed, pending a decision on what material to replace them with, and weather protection is needed, wall coverings or sheeting should be to the relevant standard, either LPS 1207/TS63 (temporary protective covers) or LPS 1215/TS62 (or equivalent for scaffold sheeting or netting).

Building Control – the recladding of buildings is very likely to be building work as defined in Regulation 3 and 23 of the Building Regulations 2010. As such a Building Regulations application must be submitted for the works. Where a local authority has been instructed to provide the building control service, they will be required to consider the plan details, consult with the local fire and rescue service and take regard of their comments and inspect the work on site. Upon satisfactory completion the local authority will issue a Building Regulation completion certificate. Similar procedures apply where an Approved Inspector has been instructed.

Project fire risk assessment

The Principal Contractor (PC), in co-ordination and co-operation with the client and designer, should make a thorough fire risk assessment to determine what controls are required as a result of the construction work, and then implement and maintain those controls. This should include preparatory enabling works, dismantling and strip off of defective cladding and insulation, and installation of new insulation and cladding.

This means considering the process fire risks and their control, i.e. minimising fire loading from stored materials and plant and controlling potential sources of ignition. It also requires ensuring that appropriate general fire precautions are implemented to ensure means of escape, fire-fighting and means to sound an alarm are provided for construction workers, and how these need to be co-ordinated with the arrangements for residents within the buildings. It must also consider what to do in the event that a fire breaks out within the building and how that might affect the construction workers and evacuation from the building. This should include how to ensure that fire appliances can still access the area around the building and not be hindered by the construction work.

The fire risk assessment should be made in consultation with the local Fire and Rescue Service (FRS), building owner and/or responsible person for the building so that any impact of the construction work on existing general fire precautions (GFP) for the building can be considered along with appropriate fire precautions for the significant fire loading of the external wall systems.

The management arrangements for the project should ensure that all working on the site are aware of the precautions and controls required, as well as a full understanding of the emergency procedures are and how they should be followed. There should be appropriate instruction and training provided for workers on emergency procedures including emergency escape.

It is also important that proper liaison is maintained with residents/occupants of the building to keep them adequately informed about the work to take place and any additional precautions residents might need to take.

Process fire risks

Risks from existing cladding and insulation

The ease of ignition and the rate of vertical fire spread on existing cladding and insulation systems will be influenced by the design and specification and quality of installation. The creation of a spreading fire on the outer surface of polyisocyanurate (PIR), polyurethane or phenolic insulation usually requires a significant external fire event. There are other external wall systems where polystyrene is used, either as insulation in a composite wall panel or with a render finish, and this will far more readily propagate a fire.

Where separate sheets of any of these insulation materials butt together, a gap between them can provide a means for an ignition source to initiate fire. If that gap between insulation blocks is large enough to admit a small flame then the fire risk is increased. Something as small as a match flame (for example a small fire created by a hot spark falling on a piece of paper) could spread quickly upwards inside the gap and rapidly develop into a large fire.

If fire barriers between insulation were incorrectly installed or omitted, a fire might spread quickly within the space behind the weather cladding.

A preliminary assessment of the cladding as installed, checking both cavity barriers and gaps between insulation panels would help to determine how susceptible that particular building would be to smaller ignition sources and the necessary level of control required; for example, how hot works (if these are deemed as permissible) should be managed and the need for extended 'hot watches' after hot works have been completed. The assessment should also identify the combustibility of any other material behind the panels, including insulation materials and membranes.

Sequence of cladding removal and replacement

Fires mainly spread upwards particularly where there are additional concerns about risks from the insulation or cladding installation or condition. Therefore, it is advisable during removal works to work from the upper part of the building downwards. This way any fire occurring before the removal work is complete will have its spread prevented or minimised. This sequence may require that at the end of each working day, the exposed top edge of the next layer of panels is temporarily filled or covered overnight (e.g. with Rockwool). In addition, this method will minimise the potential for hot items falling into the gap and starting a fire behind the panels.

If removal is to be undertaken in a different order then the risk assessment will need to clearly address why and what additional precautions are required.

The removal sequence needs to include all combustible materials beneath the cladding panels identified in the pre-work assessment. The building should not be left in an unsafe state as a consequence of the exposure of another combustible material.

It is important that combustible materials are moved away from the building as they are stripped and are not stored on work platforms, at the base of scaffoldings or in the building. Combustible materials should either be placed in an enclosed and lockable skip positioned away from the building or removed directly from site daily.

Insulated wall panels can be between 3 and 10 metres in length and may need to be cut to smaller lengths for removal and transportation. A recommended method of cutting is to use a

suitable circular saw with a tungsten tipped blade or reciprocating saw that will cut the majority of panels up to a thickness of 80 mm. Thicker panels may require use of larger diameter blades or cutting from either side. The selected method should not generate sparks.

Replacement fire stopping, insulation and external rain cladding must be installed and fixed in accordance with the design for the specified wall insulation and cladding system as the work progresses.

Sources of ignition

Sources of ignition should be eliminated so far as is reasonably practicable. All projects should be no-smoking and this needs to be strictly enforced, other than in designated smoking areas well away from the building.

Whilst sparks from a disc cutter are unlikely to ignite either the exposed face of insulation (PIR or phenolic) or scaffolding boards, there may be other combustible materials that are at risk of ignition. Clothing can be ignited by sparks particularly if exposed to continuous sparks for a period of time (flame retardant personal protective equipment is available to address this). Debris and clothing which has previously been contaminated by fuels or solvents may more easily ignite.

Only hand powered or electrical tools (drills, cut-off saws etc.) should be used, as they pose a lower risk as ignition sources. The use of petrol powered tools should be avoided to reduce ignition risks and increased fire loading from spills and refuelling. Similarly, the use of portable generators on scaffold platforms should be avoided. There is a further risk from carbon monoxide poisoning where portable generators are used on fully sheeted scaffold platforms.

Some wall insulation systems use adhesives to attach them to the building structure. Avoid use of flammable solvents to remove them and use a mechanical means instead. Similarly, use of systems relying on flammable adhesives to attach new insulation should be avoided where reasonably practicable.

Low surface temperature task lighting (such as LED lights) is strongly preferred – a damaged halogen lamp lying face down on a scaffolding board has resulted in ignition of the board and fire spread.

Any electrical equipment (tools, lighting, hoists etc.) should be properly maintained to ensure it does not create an ignition source.

Hot Works

Hot work (e.g. use of cutting torches, angle grinders etc) should be avoided where at all possible. If the wall surface must be dry before insulation/cladding is installed this drying time must be planned and carefully controlled.

The risk assessment should identify the strict control measures required for any unavoidable hot processes/work including operating a formal permit-to-work scheme.

Fire watch

Where hot work has been carried out, including surface drying, then checks should be made over two hours. There should be continuous checking for the first 60 minutes, then at regular intervals for the second hour, to ensure that no ignition has taken place and no smouldering or hot materials remain that may cause a fire. Due to the risk to residents, the

use of heat-sensitive devices (e.g. thermal imaging camera) is recommended as part of any fire watch arrangements during recladding work. A similar level of control needs to be exercised during work breaks. Switching electrical equipment off during breaks might also help.

Site Security

Site security needs to be well managed, as arson is a common cause of fires on sites. Paragraphs 117 – 121 of HSE guidance HSG 168 give further advice.

General fire precautions

The general fire precautions for construction workers and building occupants are inextricably linked and must be planned in consultation with the building owner and/or responsible person. The FRS is the enforcing authority for general fire precaution matters both inside the building and in the construction areas.

Fire detection and warning

If a fire spreads to the cladding and insulation it could directly affect both building occupants and workers. This is the case whether the fire started inside the building or in the work area. Where combustible cladding is still in situ or fire safety works (e.g. fire stopping and cavity barriers) are incomplete both residents and workers should have warning about a fire. Any warning should not be limited to one area. Instead the alarm should sound simultaneously in all work areas, including the site office, and alert within the building (e.g. alarm point with the waking watch). This can be achieved with an interlinked site alarm system with multiple call / sounding points located around work areas. Residents must receive instructions on what action to take if the alarm sounds on work areas.

Scaffold design and escape routes

Scaffold access and egress should be via stair towers rather than ladders, as it is easier and quicker to evacuate in an emergency. The number (minimum of two) and placing of stair towers must be considered as part of the risk assessment. So too, the design of the scaffold to avoid any potential pinch points during an evacuation. Escape from a scaffold should be readily achievable if there are multiple escape routes via stair towers.

If sheeting or netting is required on the scaffolding for weather and debris protection, it should be flame retardant to the LPS1215/TS62 standard. The scaffold stair towers should be kept open from sheeting to prevent smoke logging.

LPS1215 'flame retardant' sheeting is only designed to stop flames spreading, not to keep a fire trapped inside. The sheeting will always be the weak link compared to the building and smoke should escape through the sheeting before it can penetrate the building.

Trapped smoke within a sheeted scaffold will be relatively cool (compared with the flames at the fire itself) and is unlikely to affect windows and rooms of occupied buildings if the windows/walls and internal fire barriers are properly designed, installed and maintained. If windows can be opened or there are balconies, then the risk assessment should have determined what advice should be given to occupants e.g. to keep them closed during the work.

Where openings are made in cladding to allow for scaffold ties the edges should be filled with non-combustible material to prevent hot items entering the cavity behind.

The design of the access equipment / scaffolding must not block automatic opening windows that are part of the corridor venting system or impair building fire safety systems. Access to fire doors, dry risers must not be blocked or hindered by the scaffolding or fencing and automatic vent points should not be enclosed in scaffold sheeting.

Mast climbing work platform

It is essential that operatives on mast climbing work platforms and powered access cradles are alerted to any fire at the earliest opportunity so interconnected (most likely radio frequency) alarm points should be provided. In the event of a fire operatives must be able to remove themselves to a safe area where they can evacuate or be evacuated. Risk assessments should consider removal and evacuation from above and below the seat of any fire and ensure measures are in place before work commences with a system of regular review and testing.