

Managing fire risk during cladding and insulation removal and replacement on tall 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 tall 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 tall buildings. It outlines responsibilities for dutyholders and the Appendix can be used as a leaflet to hand to them.

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 (February 2018) from MHCLG (Ministry of Housing, Communities and Local Government) says that there are 299 social sector towers (>18m) that need to have aluminium composite cladding replaced. There are no similar figures for privately owned tower blocks.

Action

Recladding tall buildings are significant refurbishment projects and likely to be notifiable to HSE by F10. Information received from MHCLG shows a disproportionate split of such work across the country.

Sector, in conjunction with CD heads of operations, will prepare a separate co-ordinated intervention plan for undertaking this work. This will be based on information from MHCLG setting out where the buildings are and where high risk factors are present, including:

- towers above 18m (6 storeys).
- where insulation is not the lower-risk mineral wool.
- where there is a single means of escape for occupants.
- where no sprinklers are installed.

Sector will check for F10 notifications and compare those against the MHCLG list to identify potentially higher risk towers. This information will then be fed to those identified within the intervention strategy to undertake visits.

There may be similar recladding works to lower height buildings or to those that are privately owned and for which no information is available on risk factors. There may also be recladding works to buildings clad with non-Aluminium Composite Materials. MHCLG has gathered information on many of these too and have agreed to share this with HSE. Sector will review this information and again target these for inclusion in the intervention strategy on a risk basis.

Red concerns 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 MHCLG 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). 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 MHCLG.

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 Fire & Rescue Service (FRS). This is because the construction site (the external fabric of the building) is not fully separated from the rest of the premises by a fire resisting surface (see legal reasons for this in Demarcation below). The walls will be fire resisting but there will be air vents etc. breaching these, occupants may have windows and balcony doors open with combustible materials on balconies, and the glazing is not a fire resisting structure.

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 it is not possible to arrange a joint visit and where 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, storage 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.

Demarcation

Article 25(b) of the Regulatory Reform (Fire Safety) Order and Section 61 of the Fire (Scotland) Act appear, on face value, to place general fire precautions within the enforcement remit of HSE. But these must be read in conjunction with Regulation 36 CDM 2015 (which ultimately replaced the Construction (Health, Safety and Welfare) Regulations 1994). Regulation 36 provides that where construction sites are contained within or form part of premises occupied by persons other than those carrying out construction work, or any activity related to this work, that the FRS are responsible for enforcing Regulations 30 and 31 (so far as they relate to fire) and Regulation 32.

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

Organisation

Targeting

Inspection of refurbishment work involving the recladding of tower blocks meeting the criteria set out in the Action section (above).

Timing

As notified.

Recording & Reporting

Link inspection cases to a Fire Risk and Cladding Initiative **inspection mastercase 4547970**.

Further References

HSG 168 Fire Safety in Construction

The Ministry of Housing, Communities & Local Government (MHCLG – formerly DCLG) 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 safety team

Appendices

Appendix 1

HSE Construction Division – sector technical note

Managing fire risk during cladding and insulation removal and replacement on 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 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.

Where decisions are made to remove and replace then this note supplements the HSE 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 rain/weather panels have been removed, pending a decision on what material to replace them with, and the insulation needs to be covered with sheeting then such sheeting should be to the LPS 1215 (or equivalent) standard.

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 regulation 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/whether these need to interconnect with systems provided within the building. 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 engines 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) so that any impact of the construction work on

existing general fire precautions (GFP) for the building can be considered along with the impact of significant fire loading within occupied buildings.

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 as to what the emergency procedures are and how they should be followed. Advice from FRS should be obtained on whether emergency escape drills are appropriate for the workers.

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 is likely to be a small number of composite wall panels where the insulation is polystyrene and these 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.

Sequence of cladding removal and replacement

As any fire is mainly going to spread upwards and particularly where there are additional concerns about risks from the insulation/cladding installation or condition, it would be advisable during removal works to work from the upper part of the building downwards. This way any fire occurring as a result of the work will have its spread prevented or minimised. Furthermore, any internal

works to improve compartmentation (such as the replacement of fire doors) should be completed before cladding removal.

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.

It is also important that flammable materials are removed away from the building as they are stripped and are not stored on scaffolding or in the building (unless in a purpose built fire resisting flammable materials store).

Insulated wall panels can be between 3 and 10 metres in length and are often cut to smaller lengths for removal and transportation. An industry 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. Much thicker panels may require larger diameter blades or cutting from either side.

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

Sources of ignition

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

Whilst sparks from a disc cutter are unlikely to ignite either the exposed face of insulation (PIR or phenolic) or scaffolding boards, as described above the installation method can result in additional risk. Clothing can be ignited by sparks particularly if clothing is exposed to continuous sparks for a period of time, or if previously contaminated by fuels or solvents.

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. Use of flammable solvents to remove them should be avoided and a mechanical means used 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 building surface must be dry before insulation/cladding is installed, requiring the use of heat guns or hot air blowers, this must be planned and carefully controlled.

The risk assessment should identify whether strict control of any necessary hot processes/hot work by operating a formal permit-to-work scheme is required.

Fire watch

Where hot work has been carried out then checks should be made at regular intervals for 60 minutes after work has finished and the area rechecked two hours later, to ensure that no ignition has taken place and no smouldering or hot materials remain that may cause a fire. 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 local FRS.

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. Both residents and workers should have warning about a fire in either area. This requires a well thought out detection and alarm system throughout the whole scaffold area. Any warning should not be limited to just the area where cladding is being worked on. It is likely that both building systems and the site systems need to be interconnected so that any alarm is raised in both areas. The local FRS should have been consulted as part of the site risk assessment and planning for emergencies to confirm this.

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. Sideways spread of fire is likely to be relatively slow and escape from a scaffold should be readily achievable if there are multiple escape routes via stair towers.

The design should also take account of the position of dry risers in the building to ensure access to these is not blocked or hindered by the scaffolding.

If sheeting is required on the scaffolding for weather and/or debris protection, it should be fire resistant sheeting to the LPS1215 (or equivalent) standard.

Where a protected escape route cannot be accessed or created within the scaffolding, the scaffold stair towers should be kept open from sheeting to prevent smoke logging.

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 to keep them closed during the work.

LPS1215 'fire resistant' sheeting is only designed to stop flames spreading away from a fire, 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.