

External Wall Insulation Systems

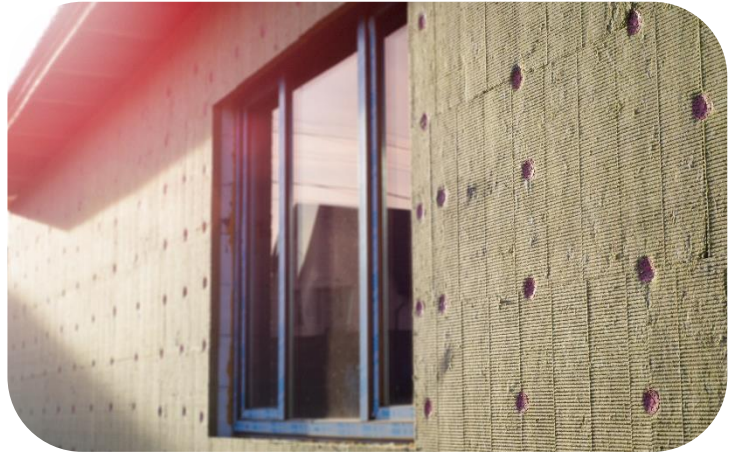
External wall insulation systems are used to insulate buildings and provide a durable external finish. However, these systems present specific risks, and this guidance aims to help minimise fire and safety hazards in buildings featuring external wall insulation systems.

External Wall Insulation Systems

Introduction

External Wall Insulation (EWI) systems, also known as External Thermal Insulation Composite Systems (ETICS) or Insulated Render, are used to provide a finish to the external walls of buildings.

The lightweight and waterproof nature of this construction method can be used to create unusually shaped walls or façades that are traditional in appearance, such as stone, brick rendered concrete block, etc., and that provide an alternative insulation method to internal or cavity wall insulation.



These systems can be used to finish new building projects and are often installed on existing walls to update the appearance of older buildings, and benefit from improved insulation and reduced heating costs, with minimal disruption to business operations.

A number of different insulation material types can be used in EWI systems, each of which has different fire performance ratings, including:

- Expanded polystyrene (EPS)
- Extruded polystyrene (XPS)
- Mineral fibre/glass wool (MW)
- Phenolic (PF)
- Polyurethane (PUR)
- Polyisocyanurate (PIR)
- Cork

The insulation material is normally applied onto a variety of substrates, typically using a cement or epoxy adhesive bonding agent, or other supporting materials such as timber or lightweight metal frames, prior to being covered by a reinforcing mesh and a rendered water-resistant finish.

Buildings fitted with an EWI system are often difficult to identify given the similarity in appearance to traditional rendered buildings with brick, concrete block, stone walls.

Understanding the Risks

The insulation material, usually ranging from 50mm to 200mm in thickness, can be attached to a range of exterior wall substrates, including reinforced concrete, concrete block, brick, cement board, exterior grade gypsum board, glass fibre-faced gypsum board, oriented strand board (OSB), using an adhesive, usually a cement based bonding agent or acrylic based bond.

Metal anchors/dowels are then drilled through the insulation into the wall to provide structural stability. The dowels should have a plastic cap or plug that seals the hole after installation to help protect against water ingress.

A fibreglass reinforcing mesh embedded in an adhesive is applied onto the face of the insulation, and finally, a weatherproof finish coat, which is usually a smooth or textured cement or similar synthetic paste, is applied either manually or by spraying.

Additional water-resistive barriers (WRB) are not normally installed in EWI construction, although water repellent primers may be used in very wet climates or where the substrate material is particularly porous. Cavity drains are also not normally required; however, they may need to be incorporated where the EWI is part of a hybrid system utilizing other claddings.

The risks associated with EWI systems include:

- **Combustible Materials.** The insulation material may be combustible or highly combustible in nature. The substrate material may also be a combustible timber board. Some systems may incorporate plastic trims, vents, etc., which are combustible in nature. Combustible materials can be stored on balconies.
- **Fire.** The insulation materials can become visible as a result of damage, wear, alterations to the buildings, etc. Combustible materials ignite and burn at relatively low temperatures and fire growth/spread is usually rapid. Ignition sources include:
 - ✓ Hot extraction systems.
 - ✓ Sparks from arcs or faults in electrical wiring and panels.
 - ✓ Hot work such as brazing, use of blowtorches, soldering, etc.
 - ✓ Smoking.
 - ✓ Cooking, use of heaters and battery charging on balconies.
- **Contamination.** Fires involving combustible insulation materials produce a range of harmful contaminants that harm health and cause environmental damage.
- **Water.** Areas of damage or poor detailing work around windows etc., can allow water to penetrate and damage the substrate, generate rot and mould. Freezing water can result in cracking and delamination of the exterior finish.
- **Workmanship.** Poor quality workmanship can result in panels detaching and becoming vulnerable to further damage in high wind weather conditions.
- **Maintenance.** Finishing work can deteriorate over time, if not adequately maintained, potentially exposing combustible insulation.

Managing the Risks

Risk Assessments

The application of EWI systems to existing buildings may significantly alter the anticipated fire performance and fire safety strategy. These exposures may be increased depending on the occupancy within the building and hazardous activities undertaken. Ensure relevant fire related risk assessments have been completed and reviewed as required. In the United Kingdom this is typically addressed within the various home nation fire risk assessment-based legislation.

Note: Statutory risk assessments are deemed the minimum requirement, and following the recommendations in this document can help further reduce the risk and exposures.

Refer to the Aviva Loss Prevention standard **Fire Safety Legislation - United Kingdom** for further guidance.

Material Damage Risk Assessment

Before installing EWI systems, an assessment of the anticipated/potential financial losses, for both material damage and business interruption exposures including loss of rent, in the event of a significant or catastrophic loss event, should also be undertaken.

This helps ensure that risk controls, detection and protection systems, etc., are sufficient and reflective of the potential property loss estimates.

Refer to the Aviva Loss Prevention Standards **Material Damage Risk Assessment** and **Business Impact Analysis** for further guidance.

Managing Change

The installation of an EWI system should be managed through a formal Management of Change process. This helps ensure all stages of the change are progressed with minimal exposure to the existing arrangements.

- These proposed changes should also be discussed with your Property Insurer and Insurance Broker.

Refer to the Aviva Loss Prevention Standards **Managing Change** for further guidance.

Fire Performance

The insulation material used in EWI systems should be non-combustible, for example, mineral fibre/glass wool, and achieve a rating of A1 or A2 under **BS EN 13501-1. Fire classification of construction products and building elements - Classification using data from reaction to fire tests.**

The EWI system should be compliant with fire related local/national regulations, standards or codes, including Loss Prevention Certification Board Loss Prevention Standard **LPS 1581: Requirements and tests for LPCB approval of non-load bearing external cladding systems applied to the masonry face of a building** and/or **LPS 1582: Requirements and tests for LPCB approval of non-load bearing external cladding systems fixed to and supported by a structural steel frame** in the United Kingdom.

Refer to [RedBookLive](#) for examples of approved products.

Should the substrate wall have an internal cavity, cavity fire barriers must be present to reduce the possibility of fire traveling through the cavity. The barriers should achieve a rating of A1 or A2 under **BS EN 13501-1** and a fire resistance rating commensurate with the fire resistance rating of the flooring within the building and comply with applicable local/national regulations, standards or codes.

The EWI system insulation should not be exposed and any areas of damage, wear, cracking, etc., should be repaired immediately. Where combustible insulation has been used, consideration should be given to replacing it with a non-combustible type.

Important: Properties over 18 metres in height present a number of fire safety challenges (e.g., escape strategy, fire-fighting access, proximity to other structures, etc.), in England, Wales, Northern Ireland and Scotland. EWI systems applied to structures in excess of 18 metres high must meet certain fire classification requirements – refer to the appropriate Building Regulations for further guidance.

Penetrations and Surface Mounted Equipment

Where the EWI system is penetrated by ducting, venting, etc., ensure these are non-combustible and appropriately fire resistance rated. Extraction ducting from boiler, cooking equipment or other heat generating appliances or infrastructure must not be installed directly onto an EWI system featuring combustible insulation and/or substrate. An alternative route within a fire-resisting service enclosure should instead be utilised.

Electrical equipment including lighting, air conditioning and refrigeration compressor/fan units, electric vehicle chargers, etc., must not be mounted directly onto, or pass through EWI systems featuring combustible insulation and/or substrate.

Housekeeping and Waste

Poor housekeeping standards and associated storage and management of waste or other combustible materials in proximity to EWI wall systems can increase the risk of fire damage.

- **Waste Management.** Waste bins and waste stores should not be located in proximity to EWI systems containing combustible insulation and/or substrate. These can be the source of many fire incidents, whether accidentally or deliberately started, and at least 10 metres separation is recommended.

Where this cannot be achieved, install a waste compound of non-combustible construction, of at least 2.4 metres in height and secured at all times to prevent unauthorised access and tampering.

Excessive waste should not be allowed to accumulate within compounds and the frequency of waste collections should be arranged accordingly.

- **Smoking.** Ensure smoking areas are located at least 10 metres from any buildings featuring EWI systems containing combustible insulation and/or substrate and that they are cleaned daily. Remove any smoking waste receptacles mounted on to such EWI systems.

Smoking waste should be segregated from other combustible waste within separate non-combustible receptacles.

- **Balconies.** Balconies on buildings featuring EWI systems containing combustible insulation and/or substrate should not be used for storage, outdoor catering, e.g., barbecues, pizza ovens, etc., smoking or charging and storage of lithium-ion battery powered equipment, such as e-bikes and e-scooters. These rules should be enforced with occupiers.
- **Flammable Materials.** Flammable materials, such as gas cylinders, gas tanks, etc, should not be located within 10 metres of any buildings featuring EWI systems containing combustible insulation and/or substrate.
- **Planting.** Follow the Original Equipment Manufacturer (OEM) and/or installer guidelines on planting in proximity to EWI systems, however ensuring adequate separation may help prevent structural damage in the long term.
- **Parking.** Ensure sufficient clearance is provided between vehicle parking areas and EWI system surfaces. Where this isn't achievable, ensure appropriate impact protection systems have been installed. EWI systems installed at lower building levels can be subject to impact damage, resulting in significant damage and exposing any combustible insulation.

Refer to Aviva Loss Prevention Standards **Housekeeping - Fire Prevention, Arson Prevention, Management of Combustible Waste, Smoking and the Workplace** and **Residential Balcony and Terrace Safety** for further guidance.

Hot Works

Hot works are tasks or equipment that use or create heat, flame or sparks. Examples include but are not limited to welding equipment, blowtorches, grinders, drills etc.

- Hot works must be prohibited within 10 metres of any buildings featuring EWI systems containing combustible insulation and/or substrate.
- Hot works undertaken within buildings should be conducted in strict accordance with the Aviva Loss Prevention standard **Hot Work Operations**.
- Thermographic cameras should be used throughout the process and during the required fire watches.
- Fire watches should be undertaken for up to 240 minutes after the hot works and only reduced where supported by a specific risk assessment.

Self-Inspection

There should be a formal and audited recorded self-inspection programme of any buildings featuring EWI systems, completed at least monthly, to ensure:

- The EWI system and any detailing, sealants, etc., are in good order with no signs of damage or exposed combustible insulation.
 - ✓ Be mindful that tradespeople, such as window cleaners, etc., may use ladders or other platforms which can damage the render finish at heights that may not be immediately visible.
- Rules and policies on waste bins and waste compounds are being followed.
- No evidence of smoking in proximity to EWI systems containing combustible insulation and/or substrate.
- Balconies are not being used for barbecues, etc., heaters, storage, smoking or charging/storage of lithium-ion battery powered equipment.
- Tenants or occupants have not installed potentially hazardous services or equipment on to EWI systems containing combustible insulation and/or substrate.
- Guttering and drainage systems are unobstructed.

Refer to Aviva Loss Prevention Standards **Self-Inspections** for further guidance.

Maintenance

The EWI system should be maintained in accordance with OEM and/or installer guidelines. This should extend to other fittings such as soffits, guttering, detailing around doors and windows, sealants, etc. EWI systems may not allow any water that penetrates the building's exterior surface to easily escape. In winter months any trapped water can potentially freeze, expand and cause cracking. When the frozen water starts to melt, the expansion recedes, and further cracks can appear. This cycle allows more water to enter, and eventually the facing material can accrue significant damage, potentially exposing large surface areas of combustible insulation.

Only use cleaning agents and paint finishes that have been endorsed or recommended by the OEM or installer.

Refer to the Aviva Loss Prevention Standard **Maintenance Regimes** for further guidance.

Training

Training for workers and other personnel with responsibilities for any buildings featuring EWI systems is essential and should cover:

- Hazards and risk management controls.
- Emergency procedures.
- Fire detection and protection systems.
- Self-inspections and housekeeping.
- Disaster and business continuity planning.

Fire and Rescue Service

Local Fire and Rescue Services are often amenable to inspecting premises to evaluate fire risk exposures, firefighting response and offer guidance. This should be considered, particularly where EWI systems contain combustible insulation and/or substrate.

It is also important to maintain suitable access for the Fire and Rescue Services and consider the distances and location to the nearest source of fire water or hydrant that they may need to use and the amount of water.

- The location and number of fire hydrants in the proximity of the premises should be documented in an emergency response plan or shown on appropriate drawings.

It is also good risk management practice to know what water supplies are available for the Fire and Rescue Service to use. Therefore, site management should always establish:

- What firefighting water supply is available.
- The static pressure flows and residual pressure test results.
- Whether additional resources, such as a private hydrant system or water storage tanks are necessary.

Please refer to the Aviva Loss Prevention Standard **Manual Fire Fighting Water Supplies** for further guidance.

Emergency Response

An emergency response plan should be specifically developed to outline key responsibilities and actions in an emergency event. The emergency response plan should include responses to all likely property and business interruption related events as described in this Loss Prevention Standard. It should also include the actions key individuals should take during emergency events.

The emergency response rules should be documented and training provided.

Refer to Aviva Loss Prevention Standard **Emergency Response Teams** for further guidance.

Business Continuity Planning

Business Continuity Plans should be reviewed to ensure disaster recovery and continuity arrangements remain adequate. Any actions generated should be addressed promptly.

Refer to the Aviva Loss Prevention Standard **Business Continuity Management** for further guidance.

Key Actions

- Ensure EWI system insulation materials are non-combustible or have proven fire performance rating that meets the requirements of an accredited third-party approval scheme.
- Ensure any penetrations, e.g., air bricks, vents, etc., are fire resisting.
- Inspect and maintain at a regular frequency, ensuring all penetrations are appropriately sealed and any damage is immediately repaired.
- Have appropriate segregation from waste bins, skips, yard storage, etc.
- Prohibit storage of combustible items, catering, heaters and smoking on balconies.
- Install impact protection in areas where the building is vulnerable to vehicular impact.
- Where combustible insulation materials and/or combustible substrates are in use:
 - ✓ Do not permit smoking within 10 metres of the system.
 - ✓ Do not allow hot work to be completed on or within 10 metres of the system. Follow Aviva Loss Prevention Standard **Hot Work Operations** where hot work is permitted.
 - ✓ Ensure 'hot' ducting is not mounted directly onto EWI systems, relocate to fire-resisting service voids.
 - ✓ Do not mount electrical equipment directly onto EWI systems.

Checklist

A generic **External Wall Insulation Systems Checklist** is presented in Appendix 1 which can be tailored to your own organisation.

Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners.

For more information please visit: [Aviva Risk Management Solutions – Specialist Partners](#)

Sources and Useful Links

- [Loss Prevention Standard LPS 1581: Requirements and tests for LPCB approval of non-load bearing external cladding systems applied to the masonry face of a building.](#)
- [Loss Prevention Standard LPS 1582: Requirements and tests for LPCB approval of non-load bearing external cladding systems fixed to and supported by a structural steel frame.](#)
- [BS EN 13501-1: Fire classification of construction products and building elements – Classification using data from reaction to fire tests](#)

Note: Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

Additional Information

Relevant Aviva Loss Prevention Standards include:

- **Arson Prevention**
- **Housekeeping - Fire Prevention**
- **Smoking and the Workplace**
- **Fire Safety Legislation - United Kingdom**
- **Material Damage Risk Assessment**
- **Self-Inspections**
- **Hot Work Operations**
- **Maintenance Regimes**
- **Managing Change - Property**
- **Self-Inspections**
- **Property and Business Impact Risk Assessment**
- **Business Continuity**
- **Emergency Response Teams**
- **Manual Fire Fighting Water Supplies**
- **Balcony and Terrace Safety - Residential Property**

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at riskadvice@aviva.com or call 0345 366 6666.*

*The cost of calls to 03 prefixed numbers are charged at national call rates (charges may vary dependent on your network provider) and are usually included in inclusive minute plans from landlines and mobiles. For our joint protection telephone calls may be recorded and/or monitored.

Appendix 1 - External Wall Insulation Systems Checklist

Location	
Date	
Completed by (name and signature)	

	External Wall Insulation Systems	Y/N	Comments
1.	Has the type of external wall insulation (EWI) material been confirmed?		
2.	Is the EWI material non-combustible, or does it have proven fire performance rating which meet the requirements of an accredited third-party scheme?		
3.	Has the substrate wall which supports the insulation been confirmed? - Non-combustible brick/block work? - Combustible, timber framed?		
4.	Does the wall have internal open cavities? Are the cavities fitted with suitable fire barriers?		
5.	Are all combustible wall systems formally recorded in appropriate drawings and documentation?		
6.	Is the condition of the wall insulation good with no exposed fixings, cracking or evidence of exposed foam or other types of combustible materials?		
7.	- Are there any exposed vents, pipes, cables or fixings that penetrate the wall/insulation material? ✓ Are any of these combustible? ✓ Can they be replaced or be encased with non-combustible materials? - If so, can these be re-routed?		
8.	Are any walls protected against potential impact damage including vehicular parking?		
9.	- Have there been instances of malicious damage or arson in the area? - Are security precautions appropriate to reduce potential malicious damage or arson attack?		
10	Is the condition of the EWI system included in regular formal self-inspection regimes?		

	External Wall Insulation Systems	Y/N	Comments
11.	- Are cracks and damage identified, and formally tracked through to repair completion? - Are repairs treated quickly and as a matter of urgency?		
12.	Are all waste bins, skips and waste materials maintained at least 10m from any identified EWI systems?		
13.	Are waste storage compounds maintained at least 10m from any identified EWI systems?		
14.	Is smoking prohibited from within 10m of any identified EWI systems? Note: In no instances should cigarette waste material holders be mounted onto EWI systems containing combustible insulation and/or substrate.		
15.	Are all forms of hot work prohibited on or within 10m of any EWI systems?		
16.	- Are balconies maintained clear of storage? - Are outdoor catering, e.g. barbecues and smoking prohibited on balconies?		
17.	Is planting maintained to prevent structural damage?		
18.	- Is there appropriate firefighting access to the buildings? - Are adequate water supplies available for firefighting purposes?		
19.	Are the EWI systems subject to maintenance in accordance with Original Equipment Manufacturer (OEM) guidelines?		
20.	Has an emergency response plan been specifically developed to outline key responsibilities and actions in an emergency event?		
21.	Has appropriate training been provided for workers and other personnel with responsibilities for any buildings featuring EWI systems covering: - Hazards and risk management controls? - Emergency procedures? - Disaster and Business continuity planning?		
22.	Additional comments:		

Please Note

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