

FIRE SAFETY GUIDE TO COMBUSTIBLE COMPOSITE INSULATED PANELS



This document is designed to assist NFU Mutual customers in managing fire risks associated with combustible composite insulated panels



NFU Mutual
RISK MANAGEMENT SERVICES

INTRODUCTION

Each year there are many fires in warehouses, cold stores, food production factories and other buildings. Whilst these are attributed to a number of factors, the potential for significant and devastating fire damage is greatly increased when combustible composite insulated panels are present. The presence of such panels can lead to rapid fire development and the Fire and Rescue Service are likely to adopt a defensive 'no entry' policy, typically resulting in a total loss of the building and significant impact to businesses and livelihoods.

This guide is aimed at providing information on fire safety where combustible composite insulated panels are present and ensure you are reducing the risks of damage to your property and the associated business interruption losses.

The potential for serious fires involving combustible composite insulated panels can be reduced by implementing a Fire Risk Management Programme to both minimize inception hazards and help reduce the spread and growth of a fire.

A designated person or team should oversee the Fire Risk Management Programme to ensure all aspects are properly considered, managed and any required corrective action is implemented without delay.

The following information is provided for guidance purposes only and note composite insulated panels which have Loss Prevention Certification Board (LPCB) certification and other non-combustible types such as mineral wool fall outside this guidance.

MAIN TYPES OF COMBUSTIBLE COMPOSITE INSULATED PANELS/LININGS

1. Expanded/Extruded Polystyrene (EPS/XPS)

Expanded polystyrene panels normally have a white core whilst extruded polystyrene panels normally feature a blue core and are often not laminated with steel facings. These are generally known as linings. Both were used extensively up until the late 1990's/early 2000's for internal lining and insulation, particularly in the food industry and in cold stores.

Both forms of polystyrene can be ignited easily by low temperature flame or sparks, spread fire rapidly inside the metal facings and are difficult to extinguish. As the

panels burn, they can produce flaming droplets of molten plastic and extensive black toxic smoke. Rapid collapse of the panels, and buildings is common.

2. Polyurethane foam (PUR).

These panels typically have a yellow foam core and were used for whole building insulation and linings until the mid 2000's, and later for smaller stand-alone cold stores. Whilst PUR is a little more difficult to ignite than polystyrene, once ignited it will burn rapidly, particularly when other combustibles are present, and with similar consequences as EPS/XPS.

3. Polyisocyanurate (PIR).

These panels succeeded EPS and PUR and generally have a yellow core, making them difficult to distinguish from PUR panels. PIR has more resistance to ignition and generally won't make a significant contribution to the spread of a fire in its initial stages, however

some current PIR panels, were/are not manufactured to LPCB standards and their performance in a fire can be uncertain. The potential for early collapse under fire conditions is also a concern. Panels from 2003 onwards should conform to **Loss Prevention Standards LPS 1181 or LPS 1208 and be certified by the LPCB.**

PANEL ASSESSMENT

1. Assess all areas of the premises featuring composite insulated panels to identify the type of panel/core material and evaluate the potential for serious fire in the light of working practices, inception hazards and likely fire spread.
2. Unidentified panel insulation material to be assumed as combustible unless confirmed otherwise.
3. The results of the assessment to be documented, together with any action points arising,
4. The assessment to be reviewed at least annually or following any significant change to the building or working practices.
5. The assessment should identify the types of panels in situ within a site plan highlighting high and medium-risk areas.
6. Combustible composite insulated panels to be labelled, warning of the hazards, requesting damage is reported/repared and hot works in proximity prohibited.

High-Risk Areas:

- i. Presence of composite insulated panels constructed from expanded polystyrene (EPS) or polyurethane (PUR);
- ii. Areas with the potential for fire inception from cooking/frying activities.
- iii. Other areas where an ancillary occupation/activity could incept fire e.g. workshops or services areas, battery charging bays, hot shrink-wrapping zones, packaging stores or areas where heat processes are undertaken e.g. grinding, brazing, welding.

Medium-Risk Areas:

- i. Presence of Polyisocyanurate (PIR) composite insulated panels which do not have any fire rating due to predating LPCB Certification;
- ii. Combustible composite insulated panels where fire is unlikely due to lack of significant inception hazards such as changing rooms or offices.

FIRE RISK ASSESSMENT

A fire risk assessment to be undertaken to identify and evaluate the potential for a serious fire at your premises. Responsibility for the fire risk assessment rests with occupiers and owners of business premises and should include the construction of the premises, including an assessment of panel types and location, working practices, fire inception hazards, likely fire spread potential and the suitability and standard of fire protections including your fire alarm, fire doors, emergency lighting, escape signage

and fire extinguishing appliances. The risk assessment to be carried out by a suitably competent person and any necessary control measures carried out to reduce the risk and effects of fire.

We recommend the local Fire & Rescue Service are invited to visit the location to assess water sources and familiarise themselves with the layout and the location of the premises.

FIRE ENGINEERING SOLUTIONS

Where possible the fire risk to be reduced by:

1. Replacing combustible composite insulated panels with non-combustible types e.g. mineral wool cored or other panels approved by the LPCB and achieving LPS 1181: Part 1 EXT A30 for external envelopes and LPS 1181: Part 2 INT-2 for internal areas, as a minimum standard;
2. Providing protected zones around high hazard areas, such as cooking halls, with non-combustible wall and ceiling panels providing at least 120 minutes fire resistance (to LPS 1181: Part 2 INT-1) or conforming to LPS 1208 FR120 rating for both integrity and insulation. Doors and other openings to be of similar rating and with automatic closure devices;
3. Sub-dividing large floor areas by wall divisions of minimum 120 minutes fire resistance with doors and other openings of similar rating and with automatic closure devices;

4. Sub-dividing large communicating roof void areas by walls of minimum 120 minutes fire resistance to the underside of the roof deck with doors or other openings of similar rating. Certain operations and activities may warrant increased fire resistance of 240 minutes e.g. high-risk plant and/or boiler rooms.

Any fire separation is to include reference to Protected Zones (The sections of roof, external walls and supporting frame of a single storey building adjacent to and within a specified distance on each side of a compartment wall) in accordance with the LPC Design Guide (Approved Document B: Fire Safety (Volume 2 - Buildings other than Dwelling Houses) Incorporating Insurers' Requirements for Property Protection.

ELECTRICAL INSTALLATIONS/EQUIPMENT

Electrical installations present a potential inception risk and so strict controls are necessary.

1. Electrical testing of the fixed installation in accordance with the current edition of Institute of Engineering and Technology (IET) Wiring Regulations: BS7671 by a member of NICEIC, who is regulated for commercial installations:
 - i. Wiring inspection of the premises with IET certification to be every 3 years in accordance with the recommendations of BS 7671 or Electricity at Work Regulations, or more frequently if advised by your electrician;
 - ii. Electrical wiring/switch panels and controls directly attached to, or passing through, combustible composite insulated panels to be inspected annually with IET certification and be subject to at least annual thermographic inspection to detect hidden hot spots and any corrective action taken as necessary;
2. Where electric cables or wiring passing through or directly attached to combustible composite insulated panels is unavoidable, fire-resistant cables to be used or cables enclosed within non-combustible insulating sleeves or conduit, and metal backing plates used behind any direct attachments to panels;
3. High temperature electrical fittings e.g. halogen lamps and fluorescent tube lighting incorporating ballast units not to be fitted directly onto combustible composite insulated panels;

4. Electrical wiring on heated doors to chillers and/or freezers to be subject to routine inspection/maintenance/calibration and to feature automatic thermostatic cut-offs, pre-set at no more than 20 degrees celcius above normal operating temperatures.
5. Knife, and/or other sterilising equipment, featuring individual electrical heating elements not to be fitted directly to combustible composite insulated panels. Any such wall surface to be lined with a non-combustible facing e.g. steel checker plate, stainless steel, aluminium etc. Such appliances to be fitted with low, and high level, float isolation switches additional automatic thermostatic cut-offs, pre-set at no more than 20 degrees centigrade above normal operating temperatures and subject to annual calibration checks, or as stipulated by the manufacturer;
6. Evaporators on refrigeration systems to be fitted with additional automatic thermostatic cut-offs, pre-set at no more than 20 degrees centigrade above normal operating temperatures and subject to annual calibration checks, or as stipulated by the manufacturer;

Further guidance can be found in the Fire Safety Guide for Electrical Installations.

CONTROL OF CONTRACTORS

1. Only competent contractors to be employed and a formal process and designated team/person appointed to ensure they adopt the necessary safety procedures. The inherent fire hazards related to combustible composite insulated panels to be incorporated into any contractor induction and/or training and site permit systems, all of which should be reviewed at least annually.
2. Any contractors 'Hot Works' to be controlled by a strict permit to work system. Contractors to hold Public Liability insurance with an adequate indemnity limit to reflect the potential exposure but of at least £5 million.

Further guidance can be found in the Fire Safety Guide for Hot Works and Health and Safety Guidance Note: Contractors and Visitors.

HOT WORK

Welding or cutting/grinding equipment, blow lamps, blow torches or similar equipment not to be used on or in immediate proximity to combustible composite insulated panels. Where the use of such equipment within the building is unavoidable it should not be completed within 2 metres of them unless they are:

- i. Protected by non-combustible fire blankets, drapes or screens, and

- ii. Subject to a strict 'permit to work' system, unless undertaken by own staff in accordance with documented safe hot working procedures/policy.
- iii. Incorporate a strict 60 minutes post hot works fire watch to ensure ignition risks are minimised.

Further guidance can be found in the Fire Safety Guide for Hot Work.

HOUSEKEEPING AND WASTE CONTROL

1. External storage of combustible goods or waste materials to be at least 7 metres (but where possible 10 metres), from the fabric of the building out of business hours, preferably within fenced or enclosed areas. Internal storage of combustible or waste materials to be kept to a minimum and within designated areas.
2. The premises and immediate external areas to be inspected and, where appropriate, cleaned daily. Roof voids to be kept clear of combustible storage and regularly inspected.
3. Modified Atmosphere Packaging (MAP) using 'oxygen injection' presents potential fire hazards and to be evaluated by a risk assessment and inherent risks reduced/controlled as necessary, e.g. location of oxygen supply pipes and tanks and provision of automatic safety cut-off devices.
4. Designated smoking areas to be at least 7 metres (but where possible 10 metres) from the buildings and external combustible storage such as pallets. Suitable disposal facilities for spent smoking materials to be provided and emptied frequently.

HEATING

1. Only fixed indirect heating to be used in areas containing combustible composite insulated panels, temporary portable heaters not to be used.
2. Heaters or boiler units to be within an area of non-combustible construction or enclosed within a fire compartmented area providing at least 120 minutes fire resistance. Where this is not possible heaters or boiler units to be at least 3 metres from combustible composite insulated panels or the panels boarded over with non-combustible material.
3. Flues used to extract hot gases not to pass through, or be close to, combustible composite insulated panels. Where this is not possible one of the following precautions can be taken:
 - i. Dual skin insulated 'cool' flues to be used;
 - ii. Combustible composite insulated panels immediately surrounding the flue to be replaced with non-combustible panels e.g. mineral wool;
 - iii. The flue outlet or hot trunking passing through the combustible composite insulated panels to be fitted with a non-combustible insulating sleeve with a minimum 120 minutes fire resistance. Any gap between the sleeve and panel to be filled with mineral fibre or other suitable non-combustible material.

BATTERY POWERED VEHICLES/APPLIANCES

1. Charging to be undertaken in an area of non-combustible construction or outside the main buildings. Where this is not possible charging is not to be undertaken within 3 metres of combustible composite insulated panels unless they are protected by non-combustible materials such as steel checker plate or mineral board extending at least 1 metre around the chargers.
2. Chargers not to be mounted on to combustible composite insulated panels but on fixed metal stands located at least 250mm from the panels;
3. Fire alarm detection, either point or aspirating, to be provided immediately above chargers and suitable ventilation provided to remove potential gas build-up through charging activities.

Further guidance can be found in the Fire Safety Guide for Forklift Trucks.

COOKING APPLIANCES

If the premises are used for frying, baking or cooking:

- i. All appliances, equipment, grease traps and removable filters to be cleaned at least weekly;
- ii. Fixed flues and extraction ducts to be deep cleaned by a competent person/company at least once every six months;
- iii. Thermostatic temperature controls or cut-out devices to be serviced and calibrated by a competent person at least annually;

- iv. Flues used to extract hot cooking gases to conform to the requirements for heater flues {see paragraph d) under HEATING}.
- v. Consider provision of automatic fire suppression to provide additional protection to cooking appliances, flues and ducting.

MAINTENANCE AND INSPECTION

All combustible composite insulated panels should be regularly inspected for damage and any exposure of core material in line with the following guidance:

- i. All combustible composite insulated panels to be inspected at least weekly and damaged panels or facings replaced or repaired, with a written log of inspections and remedial action to be kept. Fixings or joints to be maintained in good condition and tightly secured.
- ii. In addition to the weekly formal inspection, staff should be encouraged to report damage to combustible composite insulated panels/exposure of insulating core materials;
- iii. Informal panel management inspection by heads of department, engineering teams and health and safety personnel should also be completed to supplement the formal inspections;
- iv. Repairs must be categorised in terms of criticality, with damage identified within high-risk areas to be prioritised and repaired within 24 hours. All other defects should be repaired promptly;

- v. Audit systems to monitor compliance and ensure that repairs are carried out to defined timescales;
- vi. All combustible composite insulated panels to be fully capped/encapsulated where penetrated by services, with no core insulating material visible;
- vii. If building services that pierce combustible composite insulated panels are removed or modified, any resulting holes in the panel must be promptly sealed on both sides;
- viii. Any holes or gaps around services to be sealed using LPCB approved fire rated products to the same rating as the panel; non-approved silicone mastics and expanded foam sealants must not be used to seal any holes in panels;
- ix. Consider protecting combustible composite insulated panels prone to frequent damage by pallet or lift trucks by barriers or checker plate.

AUTOMATIC FIRE ALARMS

Consider installation of, or upgrading existing system, to an automatic fire alarm system conforming to **BS5839: Fire Detection and Alarm Systems for Buildings: Part 1: Code of Practice for Design installation, commissioning and maintenance of systems in non-domestic premises**, specifically designed to provide early warning fire detection. The fire alarm system should also

give a warning remotely to nominated staff by use of remote signalling or preferably to an approved alarm receiving centre.

A programme of testing, servicing, checking and maintenance in accordance with the installer's recommendations to be in place and documented.

AUTOMATIC FIRE SUPPRESSION

Consider installation of an LPCB approved automatic fire suppression system relevant to the risk, either as a fully integrated flooding system to identified 'high risk' areas, such as cooking, electrical switch rooms or plant rooms, or as individual systems to target inception hazards such as items of machinery, plant or cooking or catering equipment.

Fire suppression system to kitchen equipment to be designed and installed by an insurer-approved company to a recognized industry standard, such as **LPS1223**:

Requirements and testing procedures for the LPCB certification and listing of fixed fire extinguishing systems for catering equipment.

Fire suppression systems to electrical control or switch panels, pumps, chargers, IT suites etc. to comply with **LPS1666: Requirements and test procedures for the LPCB approval of direct low pressure (DLP) application fixed fire suppression systems** and upon activation isolate the power supply and activate the fire alarm system via a relay switch.

SPRINKLER PROTECTION

Consider automatic fire sprinkler protection to the premises specifically designed to give maximum coverage to walls, ceilings and roof/ceiling and other voids. Any new sprinkler system to be designed and installed

in accordance with LPC rules **BS EN 12845 Fixed Fire Fighting Systems - Automatic Sprinkler Installations**.

PORTABLE FIRE EXTINGUISHERS

Suitable portable fire extinguishing appliances to be located throughout the premises. Regular inspection and maintenance to be undertaken, and recorded,

by an approved supplier. Staff to be provided with instruction and training in the correct use of extinguishers.

IMPORTANT NOTE:

The information contained herein is designed for guidance only and NFU Mutual cannot accept responsibility for any errors or omissions arising from its use. Should further guidance be required please contact our local NFU Mutual Regional or Branch office, or telephone Risk Management Services on 01789 202425.



NFU Mutual

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