



**Instant Risk Guidance**

# **TR 12 Composite Panel Construction**

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## Background

Composite panels (often referred to as 'sandwich panels') are increasingly used in the wall, roof and internal construction of a wide range of buildings, the reasons for which include:

- Excellent thermal and acoustic insulation properties;
- Lightweight;
- Ease and speed of construction;
- Ease of wash down (essential in the food industry and certain other occupancies);
- Relatively low cost in comparison with traditional construction materials.

Composite panels are a prefabricated insulated system delivered to site ready for installation comprising external and internal metal skins bonded together with an insulation core.

A range of insulation core materials are employed including non-combustible mineral wool, polyisocyanurate (PIR), polyurethane (PUR) and highly combustible expanded polystyrene (EPS).

There have been many serious fires involving buildings of composite panel construction where EPS or other non-fire rated panels have been used. Experience has shown that fire spread within panels can be extremely rapid combined with immense difficulties in firefighting and the liberation of dense corrosive and toxic smoke. In some cases, premises and, subsequently businesses, have been totally destroyed.

Against this background, a number of fire testing and approvals schemes for composite panels have been established, most notably by Factory Mutual in the United States, and in the UK by the Loss Prevention Certification Board (LPCB – part of BRE Global). LPCB tests are as follows:

- *LPS 1181 Series* - The LPS 1181 series of fire growth standards covers the requirements for LPCB approval and listing of construction product

systems. These standards evaluate the fire performance of sandwich panels, built-up cladding systems and other construction product systems to ensure they will not significantly contribute to fire growth in their defined end use applications as detailed in the individual listings.

- *LPS 1208 Composite Construction Elements* - LPS 1208: LPCB fire resistance requirements for elements of construction used to provide compartmentation given in the *LPC Design Guide for Fire Protection of Buildings*.

In the case of composite panels, approval to these standards may not necessarily imply that they are non-combustible, but that they demonstrate an enhanced level of fire performance. Information regarding LPCB approvals schemes and approved products is available at <https://www.bregroup.com/products/lpcb/>

## Managing the Risk

The following guidance goes some way to reducing the risks involved with combustible composite panels. However, in some instances these measures may alone be insufficient, in which case a panel replacement programme and/or the installation of sprinkler protection may require consideration.

- A robust fire risk assessment should be conducted in accordance with the *Regulatory Reform (Fire Safety) Order* and similar legislation in Scotland and Northern Ireland to ensure that fire risks are reduced to a minimum. The construction materials present should form part of the risk assessment as regards their combustibility and contribution to fire growth.
- All combustible cored composite panels should be identified and labelled and regularly inspected for damage exposing the core. Inspections should be recorded and damaged panels repaired as a matter of priority.
- Where required, impact skirting or crash barriers should be installed as protection against panel damage.
- Penetrations through panels should be avoided wherever possible.
- Repairs to composite panels should never involve the use of welding or other obvious ignition sources. Likewise, such "hot work" should not be allowed in the vicinity of composite panels unless they are protected by non-combustible or purpose made blankets, drapes or screens. A robust

Hot Work Permit system should also be in place and any work on panels should be subject to a risk assessment.

- It is of vital importance that storage of combustible materials, such as timber pallets or plastic crates, in yard areas is not against or within risk of walls containing composite panels. Ensure a distance of at least 15 metres from buildings with hazardous processes, 10 metres from other buildings.
- Forklift truck battery charging should be carried out well away from composite panels. Preferably this should be in a separate building or area.
- Electrical inspection and testing should be carried out annually on electrical equipment and cabling in the vicinity of composite panels. Thermographic inspection of the installation at regular intervals is a cost effective and proactive tool in reducing exposure from electrically generated fires.
- Where possible, cables and services should not pass through composite panels. If this is unavoidable, they should be suitably enclosed in non-combustible material and the surrounding gaps sealed and fire stopped.
- Direct mounting of machinery and electrical equipment to panels should be avoided.
- Make cleaning and preventative maintenance of processing equipment a regular discipline, including the internal inspection and cleaning of flues and extract ducting.
- If a heater flue, or other potentially hot trunking passes through panels, this must be installed in a non-combustible insulating collar not less than 40mm thick. Proprietary sleeve systems that can achieve 60 minutes fire resistance in terms of integrity and insulation are also acceptable. Gaps between the collar and panels should be filled with mineral fibre or other suitable non-combustible material. In the case of modern plant, double skinned, insulated flues may be anticipated providing enhanced protection. However, the presence of such flues does not remove the need for panel cut back and collaring as detailed. The importance of ensuring correct attention to this aspect is paramount. Where in doubt, the advice of the panel manufacturer and equipment supplier should be sought.
- The routing of pipes containing steam or hot fluids through panels should be averted.
- Hazardous processes (such as deep fat frying) should be located well away from composite panels. The preferred solution is that all hazardous

processes be compartmented with walls and, where appropriate ceiling construction, to a level of fire resistance commensurate with the risk. Doors and other openings should be of a similar fire rating and, where required, should be fitted with automatic closers.

- Where appropriate, hazardous process equipment should be fitted with automatic fire suppression systems.
- Where there is an accessible ceiling void created by composite panels, storage should be prohibited from these areas. Designated walkways should be provided in ceiling voids as an aid to inspection. Access to such areas should be restricted.

When considering the possibilities of panel replacement, it should be kept in mind that partial replacement may result in thermal bridging owing to the variance in thermal performance of different types of panels; this can give rise to condensation.