

# RM Insight<sup>®</sup>

## Insulated sandwich panels (ISP)

Insulated sandwich panels (ISP) generally consist of two outer metal sheets with an insulated core sandwiched between them.

ISP are widely used throughout industry within Australia. They are light weight, easily cleaned, provide great insulation properties and are easy to work with. ISP can be found in cool rooms, freezers, controlled atmosphere environments, clean rooms, internal partitions and subceilings.

### Types of core

There are several types of insulating material used as the core for these panels. The performance of these panel types in a fire situation can vary wildly, with some core materials being highly combustible and contributing to some extremely large fire losses.

### Expanded polystyrene (EPS)

EPS is the most commonly used ISP due to its low cost, wide availability and ease of use. EPS is a thermoplastic, melting when exposed



to high temperatures before giving off a flammable gas which will help fuel a fire.

### Phenolic composites

These are composed of EPS beads coated in a phenolic (thermoset plastic) resin. The phenolic resin chars when exposed to fire, preventing flame spread between the EPS beads.

### Polyurethane (PUR)

PUR foam, similar to EPS, is a thermoplastic which will decompose when exposed to heat before igniting at higher temperatures.

### Polyisocyanurate (PIR)

PIR (a variation of PUR) is typically a thermoset plastic which while combustible, can char rather than melt when exposed to flame. This can allow it to better maintain structural integrity in a fire event than the thermoplastic panels. Due to the variations in formulation, it is important the performance of a PIR panel is verified by fire testing.

### Mineral wool

Mineral wool and similar products are made from a range of materials including basalt, blast furnace slag or glass. While generally non-combustible, they can use combustible binders or adhesives.

### Fire testing

In order to assess the performance of the various types of insulated panel in a fire it is important that they undergo large scale fire testing. While smaller scale tests can provide some data on a product, large scale testing is necessary to truly assess how a panel will perform in a fire event in real world conditions.

Two approval standards which test ISP in this way are the Loss Prevention Certification Board (LPCB) LPS 1181 and Factory Mutual (FM) Approval Standard 4880 and 4881. These approval standards will specify the suitable uses for the panel, height limits and the installation/fixing methods which must be used. Details of approved panels can be found at <https://www.redbooklive.com/search/index.jsp> for LPCB or [www.fmapprovals.com](http://www.fmapprovals.com) for FM approved panel listings.

### Protection/precautions

The best protection from fire for a facility is to use an approved ISP installed appropriately. As there are no approved EPS sandwich panels, they should be avoided wherever possible. If this is not possible, there are several steps that should be taken to minimise the exposure. Combustible ISP should be appropriately labelled and identified to ensure awareness of staff/contractors as to the hazards presented. Hot works and heat generating processes should be performed away from the panelling and any repair work should be done using cold working methods. This can be reinforced through the use of a permit to work system for work involving the panels. Finally, any damage to the panels that exposes the combustible core should be repaired/sealed as soon as practicable.

For more information:  
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