

FIREsafe & Insurer Approved Building Envelope Solutions

For Insulated Roof, Wall and Façade Systems



Assessed to ISO 9001: 2000
Certificate Numbers
Holywell - 260 • Kingscourt - 186



FIREfacts

The Association of British Insurers (ABI) recognise the importance of LPS 1181 approval for external composite panel systems.

The ABI have recently updated its Technical Briefing on sandwich systems which was first published in May 2003. In amended clause 4.4, the ABI have recognised the importance of LPS 1181 approval for external composite panel systems.



“For insurance underwriting purposes, Insurers use the Design Guide for the Fire Protection of Buildings as a basis for providing guidance on what they require for property protection purposes, subject to a broad based risk assessment. In respect of external composite panels, these must be suitable for the intended end use application and should either have non-combustible cores or be LPCB approved to the appropriate requirements of LPS 1181 (see paragraph 3.11) and fully satisfy insurers fire resistance requirements (insulation and integrity) through appropriate testing.” (Clause 4.4)

‘Sandwich panel systems approved by LPCB to LPS 1181 will not make a significant contribution to a fire’.

‘Panels satisfying the requirements of LPS 1181 will not make a significant contribution to fire growth’.

‘For new buildings, serious consideration should be given to the use of the better performing LPCB approved sandwich panels to LPS 1181’.

Fire Fighting Issues with Panels

‘Sandwich panels approved by LPCB to LPS 1181 should not create a problem for fire fighting if adequately supported, as any burning will be considerably reduced’.

‘There are concerns that combustible sandwich panels used inside the building (not part of the external fabric) may create an additional problem to fire fighters unless the building is fully sprinkler protected or is sub-divided by fire resisting compartment walls. The Fire Services are in general less concerned where sandwich panels are used as external roof and wall claddings, securely fixed to the structural frame of the building, since these do not represent the same danger to life during fire fighting.’

All quotations taken from the ABI's "Technical Briefing: Fire Performance of Sandwich Panel Systems" May 2003.

Kingspan **FIREsafe**™ Solutions

Kingspan **enviro**care Technical Services Department provides a best practice, project specific **FIREsafe** solutions service. If you have any questions or require specific information please do not hesitate to contact us on –

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envirocare[®]
TECHNICAL SERVICES



Approved to LPS 1181
Certificate Nos. 186a, 280a and 279c
Approved to LPS 1208
Certificate Nos. 186b and 279b

Kingspan provides a range of insulated roof wall and façade systems approved to an appropriate grade within LPS 1181 and LPS 1208

The determination of insurance premiums and policy excess is a complex process and depends on a range of factors including the building fabric, contents, / operations within the building, fire suppression, alarm systems, arson risk, levels of fire safety management etc.

The building fabric is an important part of this assessment. Choice of an appropriate grade of LPCB approved panel will lead to -

- No Additional Premium
- No Additional Excess
- No professional Indemnity (PI) insurance restrictions

- compared to traditional, non-combustible building fabric systems.

Identification Plaques

Fire officer and insurance surveyor identification plaques are used for rapid identification of building fabric Kingspan maintain a project register of all buildings constructed with **FIREsafe** roof and wall systems identified by a special registration number.

Identification plaques have been supplied to over 1000 buildings.

Kingspan **FIREsafe** labels are available for attaching to the building to assist property insurers and fire brigades. Labels are available on request.

Invisible Marking

Invisible marking of panels allows insurance surveyors, architects, specifiers & building owners proof of specification

All Kingspan panels carry identification markings which are printed in ultra violet sensitive ink-jet print. This identification on all panels includes the following information

- Date and time of manufacture
- Core insulant specification

LPCB and FM **FIREsafe** markings are applied on all panels to the underside of the crown overlap on roof panels and adjacent to the female joint on wall panels.



Identification markings are easily read with an ultra-violet torch, which are available free of charge from Kingspan Marketing Services Department

Kingspan **FIREsafe**[™] systems can provide specification compliance with the following grades of performance -

LPS 1181 Part 1 External Enclosures
- EXT-B, EXT-A15, EXT-A30

LPS 1181 Part 2 Internal Enclosures
- INT-2*, INT-3*

LPS 1208 Fire resisting Wall / Ceilings
- FR30, FR60

FM Global - FMRC 4880
- Class 1 with no height restriction

* Certification pending

Performance & Certification of Kingspan **FIREsafe**[™] Systems

The most important way of distinguishing between different cladding systems is through fire testing. Building Regulation tests are important in this respect but it must always be remembered that the key objective of Building Regulation guidance is to ensure that personnel can leave the building safely in the event of a fire. Property conservation is not a key consideration to regulators – in stark contrast to insurers.

It is clear that the existing Building Regulation tests and the new Euroclass Reaction to Fire Tests do not fully assess panel performance and should not be taken in isolation.

Insurers recognise the limitations of the small scale reaction to fire tests used to demonstrate compliance and have developed their own tests. In addition to tests developed by LPCB and FM there is a range of other relevant large scale tests.

Kingspan **FIREsafe**[™] panels perform well in all these tests and with characteristic performance being:

- formation of stable protective char
- no flash over
- no flame spread – particularly in the core of the panel
- no fire propagation
- no panel collapse
- relatively small and acceptable smoke levels
- high levels of fire resistance – up to 60 minutes insulation and integrity is achievable with specific systems

Kingspan's huge investment in large scale testing provides proof of the excellent fire performance of **FIREsafe**[™] panel systems.

Insurer Certification Requirements

Factory Mutual (FM) Approval Requirements



FM Global, formally known as Factory Mutual, has a quite different - but equally severe - test standard for assessing reaction to fire.

This test standard is FMRC 4880 (1994) Approval requirements for Class 1 fire classification with no height restriction.

Achievement of Class 1 with no height restriction is dependent on performance in a number of tests that include -

- ASTM E84 Surface Burning Characteristics
- ASTM D482 Ignition Residue tests
- ASTM E711 Oxygen Bomb tests
- UBC 26-3 Room Test
- FMRC Room Corner Test (25/50ft test)

The 50 ft wall test is very severe. Two walls 15.24m high with a small ceiling are lined with panels and a large fire source (345kg dry timber) is positioned in the corner. To achieve approval there has to be no flame spread or fire propagation to the extremities of the panel construction. **Kingspan FM approved panels are well within these limits with no flame spread away from the fire source.**

FM Approval - Class 1 with no height restriction



char layer
unaffected PIR

Loss Prevention Certification Board (LPCB) Certification Requirements

Differences between structurally supported external panel systems and self supporting internal panel systems have long been known.

New LPS 1181 Introduction

The original Loss Prevention Standard LPS 1181 Issue 3 1999 has now been replaced by - LPS 1181: 2003. Requirements and Tests for LPCB Approval of Wall and Ceiling Lining Products and Composite Cladding Products.

- Part 1 External Envelopes
- Part 2 Internal Enclosures

External Envelope

Grades of performance are now described as EXT-A and EXT-B. These grades are identical to the original Grade A and Grade B respectively. For the vast majority of external cladding applications EXT-B will continue to be suitable. EXT-A will only be required for buildings with special risks as defined by an appropriate risk assessment or in boundary wall conditions.

Internal Enclosures

This new standard is aimed at 'box within a box', applications - particularly the food and drinks sector but also covers pharmaceutical and electronics industry clean rooms etc. Performance requirements are:-

INT1

This grade is achieved by testing to LPS 1181 : 2003 : Part 2 using the enhanced burner (tested in internal box configuration) plus 60/60 insulation/integrity in BS 476 part 22 (tested both ways for walls and from underneath for ceilings). Recommended for high risk processes in large compartments.

INT2

This grade is achieved by testing to LPS 1181 : 2003 : Part 2 (tested in internal box configuration) plus 30/30 insulation/integrity in BS 476 part 22 (tested both ways for walls and from underneath for ceilings). Recommended for medium/high risk processes in small compartments and normal risk processes in large compartments.

INT3

This grade is achieved by testing to LPS 1181 : 2003 : Part 2 (tested in internal box configuration). Recommended for normal risk processes in small compartments.

Loss Prevention Certification Board (LPCB LPS 1181)



FIREproof

Real Fire Case Studies

Clifton Comprehensive School, Rotherham - 30th July 2004



A serious fire took place in the roof void of a new school building in Rotherham. In this case Kingspan KS1000 LP (Lo-Pitch) LPCB approved roof panels were exposed to an intense fire in an aerial walkway. The fire was investigated by Tenos and South Yorkshire Fire Service and again it was clear that the panels played no role in fire spread and actually played a key role in preventing fire propagation over a compartment wall.

The fire took place just 6 weeks before the facility was due to open, the building contained many thousands of pounds of brand new computers and other equipment. The fact that there was no smoke damage to the equipment and the building opened on schedule demonstrated the excellent fire performance of the cladding system.



Eagle Global Logistics, Purfleet



A devastating fire at a large logistics warehouse operated by EGL (Eagle Global Logistics) in Purfleet, demonstrates the impressive fire performance of Kingspan's LPCB (Loss Prevention Certification Board) -approved panels, which played a significant role in preventing fire spread to an adjacent building.

This fire completely burnt out the EGL building. Significantly, the Kingspan panels on the adjacent building, which was only 9 metres from the burnt out unit, played an important role in preventing fire spread. The severe heat and flames generated by the burning building were so intense that the paint coating on the Kingspan panels on part of the next-door building was burnt off but the PIR core did not ignite and no flames or smoke entered the adjoining building.

An investigation by ACE Risk Consultants has concluded that the Kingspan panels that formed part of the external walls of the burnt out building did not play any role in the development and spread of the fire. It has also been reported that the coordinating fire investigation officer had nothing negative to say about the construction of the burnt out building.



Real Fire Case Studies

Wharfedale Hospital - 5th July 2003



Wharfedale Hospital - 5th July 2003

This is the first recorded fire in a building clad in LPCB approved PIR panels. This fire occurred in an extension to the hospital under construction. An arsonist ignited a solvent based adhesive poured over a large pile of combustible building materials that was stored in the ground floor of the facility. The ground floor was essentially open with the external cladding starting at the first floor level. Kingspan commissioned Tenos to perform an independent investigation into the fire. This involved a visit to site and discussions with West Yorkshire Fire & Rescue. A detailed report is available.

The Tenos report concludes - *"In spite of significant heat generated by the fire (sufficient to damage the intumescent coating and distort the steel beams); the orientation of the cladding panels directly above the fire; and the fact that the fire stopping was not in place; the cores of the panels as evidenced by photograph 2 and 3 did not ignite; did not promote fire spread within the core or to the eaves and did not significantly contribute to the products of combustion."*



These photographs provide a record of the damage and include some explanatory comments.

1 Side of the building exposed to direct flame impingement and smoke/heat damage from the ground floor. It is clear that the PIR core has not ignited and has played no role in the fire.

The side of the building that experienced a bigger fire attack. Flames appear to have risen to the eaves – a height of approximately 10 metres. The external steel sheet has bowed and delaminated in the areas of flame impingement – however, there is no indication the fire has spread through the cladding.

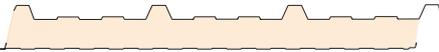
2 Sections were cut out of the short panels in order to inspect the steel column behind the panels. The photograph below left shows this more clearly.

Close-up of the inspection holes cut in the panel after the fire. The insulation core can be seen clearly and looks to be virtually unaffected by the direct flame impingement on the outer steel facing. The steel column was not affected.

3 A panel that has been exposed to direct flame impingement on the outer sheet. The metal has been pulled away by contractors to inspect the PIR core. It is clear that the insulation core has been almost unaffected by the fire. Only light charring can be seen.

Kingspan **ECOsaf**e Insurer Approved **FIREsaf**e & Certified Systems

Insurer Approved Loss Prevention Certification Board (LPCB) & Factory Mutual (FM) Products

ROOF SYSTEMS	FM APPROVAL*
KS1000 RW 	FM Core 40, 50, 60, 70, 80 & 100mm Main fix every valley - External stitchers @ 450mm centres Max purlin centres 2m. Product Ref: KS1000 RW/FM ECOsaf e Roof
KS1000 TS 	N/A
WALL SYSTEMS	FM APPROVAL*
KS1000 RW 	FM Core 40, 50, 60, 70, 80 & 100mm Horizontally or vertically laid Main fix every valley - External stitchers @ 450mm centres Product Ref: KS1000 RW/FM ECOsaf e Wall
KS1000 RW/FW30 KS1000 MR/EB/FL-S/MM/CX/WV & Optimo 	FM Core 45, 60, 70, 80 & 100mm 900 & 1000mm wide only Horizontally or vertically laid Product Ref: KS1000 MR/FM ECOsaf e Wall

BS 476: Part 22: Fire Resistance Products (Walls only)

PRODUCT	FM APPROVAL*
KS1000 RW 	N/A
KS1000 MR/EB/FL-S/MM/CX/WV & Optimo 	N/A

Internal Insulated Temperature Control Systems

	FM APPROVAL*
KS1150 CS (Cold Store Chill Store & Food Hygiene) 	80, 100, 125, 150, 175 & 200mm ceiling & wall panels

* Approved to FMRC 4880 CLASS 1 Fire Classification
(no height restriction - ie - unlimited height)

For fire performance on all other products contact
Kingspan **envirocare** Technical Services
Freephone: 0800 587 0090

LPS 1181 PART 1 - GRADE A (EXT-A)	LPS 1181 PART 1 - GRADE B (EXT-B)
N/A	LPCB Core 40, 50, 60, 70, 80 & 100mm Main fix every valley - External stitchers @ 450mm centres Product Ref: KS1000 RW ECOSafe Roof
N/A	LPCB Core 45, 50, 60, 70, 80 & 100mm Product Ref: KS1000 TS ECOSafe Roof *Approval limited to use with non-combustable walls and max 54kg/m ² tile weight.
LPS 1181 PART 1 - GRADE A (EXT-A15)	LPS 1181 PART 1 - GRADE B (EXT-B)
LPCB Core 40,50, 60, 70, 80 & 100mm Horizontally or vertically laid - Maximum rail centres 3m Main fix every valley - External stitchers @ 300mm centres Product Ref: KS1000 RW ECOSafe Wall KS1000 RW/FW (EXT-A30) 100mm	*
LPCB Core 70, 80 & 100mm 600, 900 & 1000mm wide Horizontally or vertically laid - Maximum rail centres 3m Internal fixings @ 250m centres Product Ref: KS1000 MR ECOSafe Wall	*
	LPCB Core 40, 50, 60, 70, 80 & 100mm Horizontally or vertically laid Main fix every valley - External stitchers @ 300mm centres Product Ref: KS1000 RW ECOSafe Wall
	LPCB Core 45, 60, 70, 80 & 100mm 600, 900 & 1000mm wide Horizontally or vertically laid Product Ref: KS1000 MR ECOSafe Wall

BS 476: Part 22: Fire Resistance (Insulation & Integrity)

TWO HOUR INTEGRITY FIREWALL - Core 40, 50, 60, 70, 80 & 100mm * Up to 18 mins insulation / Up to 144 mins integrity Horizontally or vertically laid Main fix every valley - External stitchers @ 300mm centres Maximum rail centres 3m	N/A
TWO HOUR INTEGRITY FIREWALL - Core 45, 60, 70, 80 & 100mm * 15 mins insulation / 120 mins integrity Horizontally or vertically laid 0.4mm thick steel liner & 60mm 23kg/m ³ rock fibre Maximum rail centres 2m	N/A

* *Sheeting rails/cleats to have slotted connection and nylon washers.*

BS 476: Part 22: Fire Resistance (Food Sector Buildings - Internal Panels)

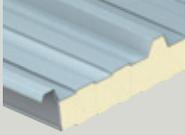
BS 476: Part 22: 1987 Clause 5 Walls (EN1364 Part 1)			
Thickness (mm)	Integrity (E)	Insulation (I)	LPS 1208 Walls
100mm	30 mins	30 mins	Grading: FR30
125mm	30 mins	30 mins	Grading: FR30
150mm	30 mins	30 mins	Grading: FR30
175mm	30 mins	30 mins	Grading: FR30
200mm	60 mins	60 mins	Grading: FR60

BS 476: Part 22: 1987 Clause 9 Ceilings			
Thickness (mm)	Integrity (E)	Insulation (I)	LPS 1208 Ceilings
100mm	30 mins	30 mins	Grading: FR30
125mm	30 mins	30 mins	Grading: FR30
150mm	30 mins	30 mins	Grading: FR30
175mm	30 mins	30 mins	Grading: FR30
200mm	60 mins	60 mins	Grading: FR60

Kingspan Insulated Roof, Wall & Façade Systems

Roof Systems

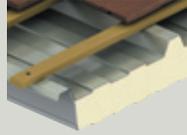
KS1000 RW
Trapezoidal



KS1000 SF
Secret Fix



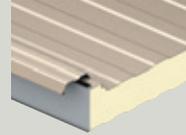
KS1000 TS Slate
& Tile Support



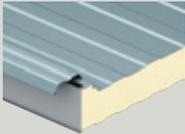
KS500/1000 ZIP
Kingzip® Standing
Seam



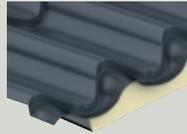
KS1000 LP
Lo-Pitch



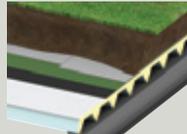
KS1000 CR
Curved Roof



Kingspan
Roof Tile



Kingspan
Envirodek™



KS1000
Polycarb Rooflight



Wall & Façade Systems

KS600, 900
& 1000
Optimo™



KS600, 900
& 1000 MR
Micro-Rib



KS600, 900
& 1000 EB
Euro-Box



KS600, 900
& 1000 FL
Flat



KS600, 900
& 1000 FL-S
Stucco



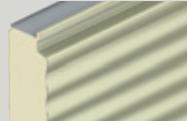
KS600, 900
& 1000 MM
Mini-Micro



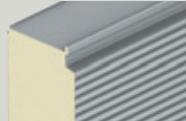
KS600, 900
& 1000 CX
Convex



KS600, 900
& 1000 WW
Wave



KS600, 900
& 1000 LS
Longspan™



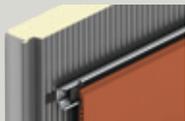
KS1000 RW
Trapezoidal



KS1000 FC
Box Profile



Kingspan
Thermatile



Kingspan
Thermabrick™

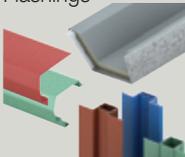


Kingspan
Thermastone



Ancillaries

Gutters, Tophats &
Flashings



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