kingspan insulated panels | controlled environments

KS1100 CS

Insulated Panels for Temperature Controlled & Hygiene Safe Building Applications

Publication date: July 2012

Kingspan
Insulated Panels

controlled environments

controlled environments

introduction

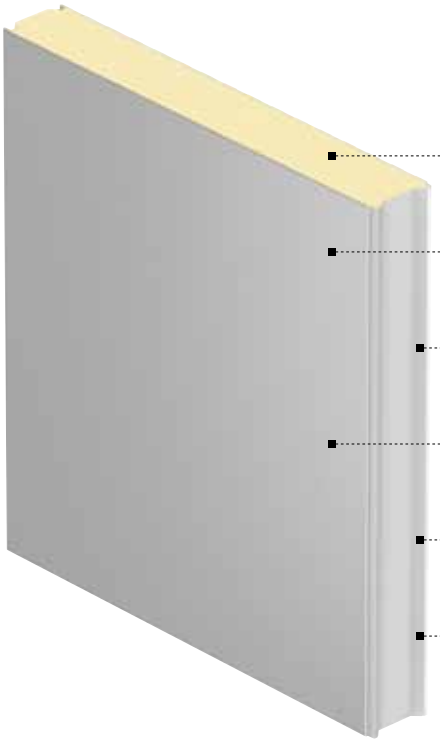
Kingspan FM Approved controlled environment panels provide increased energy efficiency, reduced CO_2 emissions, extended lifetime expectancy and give superior fire performance.

Kingspan manufacture insulated panel systems, designed for use within temperature controlled and hygiene safe environments such as food processing, freezers, cold/chill store and clean rooms for the bio-technology and pharmaceutical industries.

These firesafe, hygienic and fibre-free insulated panel systems are suitable for internal and external walls and ceilings, including internal `box within a box' applications.

Why Kingspan insulated panels?

Kingspan controlled environment panel systems are available in a range of profiles, thicknesses, colours, finishes and offer a number of vital benefits.



PIR insulation core - excellent R / U values

Closed cell insulation eliminates moisture ingress and performance failure

Available in high performance / hygiene safe antibacterial coating

Low air leakage minimises potential transmittance of airbourne pollutants

Effective heat barrier manages extreme internal / external differentials

Suitable for temperatures -55 to +60

Firesafe system - effective fire resistance

Fibre-free core - no fugitive fibres

FM APPROVED

FIRESafe

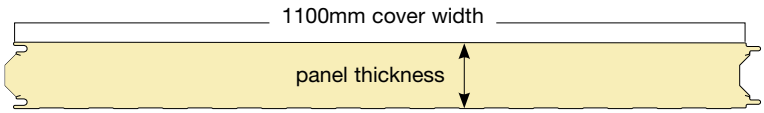
Contact your local Area Sales Manager or Customer Services for further information.

controlled environments

product range

Dimensions and Weights

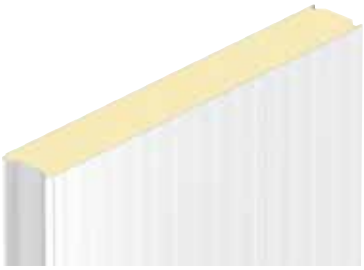
Panel Thickness (mm)	50	75	100	125	150	200
R Value (m^2K/W)	2.65	3.90	5.15	6.40	7.65	10.15
U Value (w/m^2K)	.38	.26	.19	.16	.13	.10
Weight Kg/m^2 0.5/0.5 Steel	10.00	11.00	12.00	13.00	14.00	16.00



Profiles

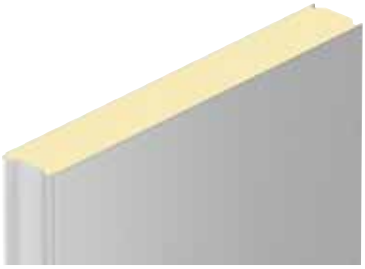
KS1100 CS Rib
Internal Application
Internal Wall or Ceiling

External Application
Wall - Vertically or Horizontally Installed

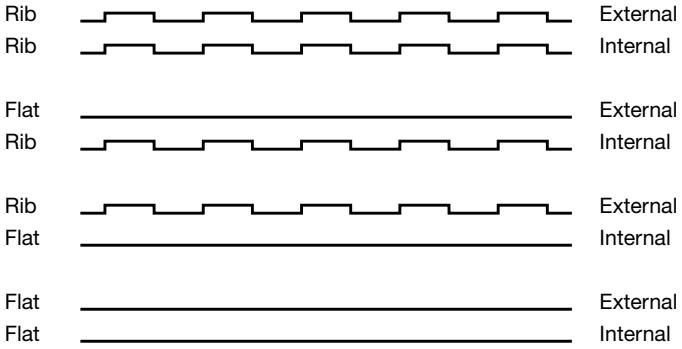


KS1100 CS Flat
Internal Application
Internal Wall or Ceiling

External Application
Wall - Vertically or Horizontally Installed



Standard External and Internal Facing Combinations



product data

Materials and Coatings

Internal liner & external sheet

Substrate to be 0.50mm thick Z275 Zincform G300S coated steel to AS1397.

Coating

Antibacterial White (25% gloss) – 25 microns thick specifications available on request

Note: for other colours and coatings, please contact your local Area Sales Manager. Please refer to page 52 for contact details.

Insulation Core

The core of KS1100 CS is an environmentally sustainable PIR insulation which is non-deleterious with zero Ozone Depletion Potential (ODP).

Supplied in thicknesses of 50, 75, 100, 125, 150 and 200 mm the rigid PIR insulation is closed cell and CFC/HCFC free.

The auto adhesive properties of the core bond and the internal and external panel faces together control the panel thickness achieved during manufacture.

FM Panel System Approval

Kingspan KS1100 CS panel systems are available with FM Global FMRC 4880 Approved Unlimited Height and FM Global 4881 Approved Class 1 Exterior Wall System Certifications.

Available Lengths

Standard lengths are from 2m to 13.7m, longer lengths can be supplied on request. For orders supplied outside of Australia maximum lengths are 11.8m. Maximum length for panels transported by rail is 12m.

Panel Joint

The tongue and groove joint achieves excellent thermal performance. The panel side joint can accommodate vapour or hygiene safe seals.

Quality

KS1100 CS insulated panel systems are manufactured from the highest quality materials, using state of the art production equipment to rigorous quality control standards. Accredited to ISO 9001 : 2008.

Warranty

KS1100 CS insulated panel systems are available with up to 10 years thermal and structural performance warranty.

product considerations

Packing

Standard Packing

KS1100 CS panel systems are stacked horizontally. The entire pack is shrink wrapped. The number of panels in each pack depends on panel length, weight and thickness. Typical pack height is 1200mm.

Delivery

All deliveries (unless indicated otherwise) are by flatbed road transport to project site. Off loading is the responsibility of the client. Export orders are transported in shipping containers.

Panel Rebate

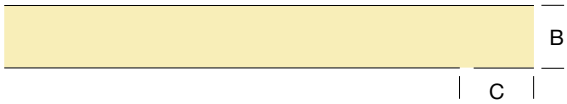
For panel wall to ceiling and wall to wall junctions, panels can be manufactured with a rebate cut to one side at one end if required (refer to order forms).

Dimension B

The depth will be 50% of the panel thickness (i.e. for 100mm panel = 50mm)

Dimension C

the depth can be 50mm; 75mm; 100mm; 125mm; 150mm and 200mm.



NB. Rebates are subject to Kingspan manufacturing tolerances. Details available upon request.

Product Tolerances

Length (mm)	–5	+5
Width (mm)	–2	+2
Thickness (mm) <100mm thick	–2	+2
Thickness (%) >100mm thick	–2	+2
End Squareness (mm)	–3	+3
Flatness (mm) (1 metre)	–1.5	+1.5

Acoustics

KS1100 CS panel systems have a predicted single figure weighted sound reduction Rw = 24dB

Sound Reduction Index (SRI)

Frequency (Hz)	SRI (dB)
63	13
125	17
250	21
500	26
1000	26
2000	26
4000	42
8000	52

application
clean rooms

18 / 24°C

Refer to the Kingspan website to view latest Controlled Environment case studies.

Low air leakage

hygiene safe antibacterial coating

Fibre-free core - no fugitive fibres

Buildings in these classifications are typically laboratories for use in clinical, diagnostic, teaching fields and quarantine applications that can require a level of physical containment.

These facilities often require the handling, processing or storage of hazardous, infectious or sensitive materials.

Facilities are classified in accordance with the level of Physical Containment that they provide, ranging from PC1 to PC4 with PC1 being the lowest level of containment. They are constructed as an enclosed space to enable the control of airborne particles, temperature, humidity, air pressure, air flow patterns and levels of contamination. Contamination is controlled primarily by sealing of the space itself as well as space pressurisation and the use of high efficiency filtration systems.

Building design can assist in optimising the control of these elements.

Manufactured using a hygiene safe coating and with a panel joint system that helps limit airleakage, Kingspan panels deliver against the criteria required for the construction of clean rooms. Speak to Kingspan Technical Services regarding specifications for clean room applications. ■

application
food processing

10 / 18°C

Refer to the Kingspan website to view latest Controlled Environment case studies.

Hygiene safe antibacterial coating

Firesafe system - effective fire resistance

Suitable for range of temperatures

Sanitation is key when it comes to food processing environments and as such food processing facilities should be designed to eliminate any contamination threats, both in the layout of the facility and in the fabrication.

Spaces should be designed with internal surfaces to avoid dust and dirt accumulation and allow for thorough cleaning.

To prevent the access of rodents, birds and insects the design should ensure that there are no gaps in the construction – paying particular attention to how walls and ceilings join. As many food processing operations involve heating as well as cooling, fire performance is of critical importance to protect property investment.

Available with a hygiene safe coating and a PIR fire resistant core, Kingspan controlled environment panel systems are ideally suited for food processing environments.

application
cold / chill store

-2 / 5°C

Refer to the Kingspan website to view latest Controlled Environment case studies.

Effective heat barrier

Suitable for low temperatures

Closed cell insulation eliminates moisture ingress

A Cold/Chill Store provides an appropriate environment for the storage of a range of goods in which temperature, humidity and air movement is controlled.

Conditions need to be consistent to ensure that operating standards are sustained and to prevent even the slightest variation in the quality of the stored product. Control of heat flow through insulated surfaces, efficient external vapour sealing and low air leakage is essential for maintaining uniform conditions.

Suitable for low temperatures and resistant to moisture ingress, Kingspan controlled environment panels are ideally suited to cold/chill Store applications.

■

application
freezer

-55 / 0°C

Refer to the Kingspan website to view
latest Controlled Environment case studies.

Hygiene safe antibacterial coating

Suitable for low temperatures

Closed cell insulation eliminates moisture ingress

Freezers are used for both the active freezing and for the storage of frozen produce

The physical design of a freezer enclosure is often determined by floor space, operations schedule and where relevant the proximity to infeed and outfeed locations. Key considerations for the design and construction of freezer enclosures are the effective sealing of exterior joints and the use of hygienic finishes which resist moisture penetration and any risk of toxic mould or bacterial growth. As freezers are utilised for extended operating times it is beneficial to consider the stability and likely life of the fabric of the construction.

The materials used for the freezer enclosure can have a major impact on the operational efficiency of the freezer - considering the fabric of the enclosure from the onset can help in making substantial operational energy savings.

Kingspan panels deliver a hygienic environment with minimal long-life maintenance requirements and enhanced energy efficiency.

application
agriculture / livestock

21 / 32°C

Refer to the Kingspan website to view latest Controlled Environment case studies.

Effective heat barrier manages internal / external differences

Low air leakage minimises potential transmittance of airbourne pollutants

Available in hygiene safe antibacterial coating

Maximising the growth and wellbeing of crop and livestock requires the careful regulation of temperature, humidity, light and air flow.

Livestock and agricultural buildings are often large sheds that are used 24 hours a day throughout the year. They can be functioning in areas where there are large weather fluctuations or where the required internal temperatures are significantly different from outside.

Environmental control can therefore consume considerable amounts of energy, which can be a substantial factor in running costs.

Good building design can assist in delivering a high performing building that helps facilitate stable conditional requirements, an improved environmental footprint and furthermore, deliver operational energy savings.

Kingspan panels utilise an energy efficient core which delivers exceptional R and U values, and can help maintain constant internal temperatures regardless of external weather fluctuations. This places less demand on cooling and ventilation equipment. Speak to Kingspan Technical Services regarding specifications relating to buildings in this classification.

■


LAGARDE

technical information

Kingspan panels can be used in a variety of ways for controlled environment applications. The applications can vary enormously from heated or cooled rooms, food handling and preparation, pharmaceuticals and biological containment applications.

Flexible design guidelines mean that the panels can be used to work in with existing designs in wall and ceiling construction. In other cases buildings can be purpose-built to suit the capabilities of the panel systems, and thereby optimise building performance.

Kingspan design information is intended to assist building designers in the choice of insulated panels in construction.

technical design

Design Principals

Kingspan panels are designed as a cladding system rather than as a structural element. Designers should take this into consideration when designing the supporting structural steel.

For Factory Mutual (FM) approved installations, steel angles (as opposed to aluminium) should be used, together with the appropriate fixings and sealants (refer to Kingspan standard details for examples).

Thermal Bowing

In Cold/Chill Store and Freezer situations Insulated Panels will generally bow outward away from the cooler environment. This is because the thermal contraction of the inner liner sheet and the thermal expansion of the external liner sheet if exposed to heat source such as sunlight.

Additional thermal bowing may occur in freezer situations due to linear thermal contraction of the structural steel in the plane of the panel. For very tall or large spanning structures the thermal contraction of the structural steel needs to be considered at design stage.

Where the external skin of the panel is exposed to direct sunlight the colour of the panel has a substantial impact on the maximum external surface skin temperature.

Load Conditions

All insulated panels are affected by temperature as well as live and dead loads, and the following combinations have been considered

Temperature Load + Live Loads + Dead Loads =
Total Project Design Load

Using the recommendations in EN14509 and AS/NZS 1170 all of the loads can be factored to represent either serviceability or ultimate limit states.

Wall Panel Construction

Internal walls

Construction within an external building envelope is not normally subject to wind and snow loads, therefore the highest loads are imposed loads for foot, plant, and equipment, which typically occur during site erection. A uniformly distributed load of 0.3kPa is usually the minimum design requirement, for a span which does not exceed L/100 as a deflection criteria.

In some cases internal temperature gradients may exist between rooms, such as between a chiller / freezer for example. In such cases additional temperature stresses need to be taken into account in wall panel design.

External walls

External walls are subject to greater loads due to winds and temperature gradients across the panels, the latter which will vary from summer to winter.

Design parameters in our span tables consider the extreme cases of winter cold external surface temperatures (increasing panel pressure) and summer (80ºC) hot surface temperatures (increasing panel suction).

To minimise the number of panel joints and junctions in construction, cold stores are generally constructed with panels installed in their vertical plane with single panels to the full height of the store. In cases where intermediate supports are required, multi-span loads need to be determined and Kingspan should be consulted.

Two and multi-span walls

At intermediate supports the panels are subjected to a combination of shear and bending due to the panel load. This will also include a moment due to the temperature gradient across the panel.

Ceiling Panel Construction

Internal ceilings

Internal ceilings are designed in accordance with AS/NZS 1170, and allows for the panel deadweight, a point load for trafficability / servicing and a uniformly distributed load.

When dimensioning for ceilings / roofs, allowance should be made for the load imposed by a person(s) during panel installation. Additional considerations are required if the ceiling /roof is to be of a “walk-on” type, and should include additional panel protection in the trafficable area. For further details consult Kingspan Technical Services.

Any additional loadings due to plant and equipment, or trafficable walkways / access supported by the ceiling panels and / or building structure should be provided for at the design stage.

Design considerations

A ceiling suspension system, having the appropriate load test certification, should be sourced from a reputable supplier and installed to their specification. The support sections and fixing brackets should be manufactured from steel, (no aluminium to be used) with a minimum panel bearing width of 50mm.

technical design

Panel Selection

A useful guide for panel selection based on the operating temperatures is given below.

Panel selection should be based on the worst case result from both tables. The recommended minimum insulation value for Coldstores is 10W/m^2 heat gain. (See IACSC Code of Practice for the Design of Coldstore Envelopes).

Heat Transmission

Thermal Conductivity 0.020 W/mK

Temp. Difference	Panel Thickness (mm)					
(ºC)	50	75	100	125	150	200
10	4.00	2.67	2.00	1.60	1.33	1.00
15	6.00	4.00	3.00	2.40	2.00	1.50
20	8.00	5.33	4.00	3.20	2.67	2.00
25	**10.00**	6.67	5.00	4.00	3.33	2.50
30	12.00	8.00	6.00	4.80	4.00	3.00
35	14.00	**9.33**	7.00	5.60	4.67	3.50
40	16.00	10.67	8.00	6.40	5.33	4.00
45	18.00	12.00	9.00	7.20	6.00	4.50
50	20.00	13.33	**10.00**	8.00	6.67	5.00
55	22.00	14.67	11.00	8.80	7.33	5.50
60	24.00	16.00	12.00	**9.60**	8.00	6.00
65	26.00	17.33	13.00	10.40	8.67	6.50
70	28.00	18.67	14.00	11.20	9.33	7.00
75	30.00	20.00	15.00	12.00	**10.00**	7.50
80	32.00	21.33	16.00	12.80	10.67	**8.00**

Operating Temperatures and KS1100 CS Panel Thicknesses

External Ambient	Operating Temperature (˚C)																
Temperature 20˚C	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55
KS1100 CS – 50mm																	
KS1100 CS – 75mm																	
KS1100 CS – 100mm																	
KS1100 CS – 125mm																	
KS1100 CS – 150mm																	
KS1100 CS – 200mm																	

technical
span tables

KS1100 CS External Wall Panel

Outer Sheet 0.5mm (steel), Inner Sheet 0.5mm (steel)

Single Span Condition

Panel thickness (mm)	Load type	Uniformly distributed loads kN/m² Span L in metres											
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
		Ultimate Limit State											
50 mm	Pressure	2.07											
	Suction	2.05											
75 mm	Pressure	3.16	2.32	1.78	1.40								
	Suction	3.05	2.24	1.71	1.35								
100 mm	Pressure	4.25	3.12	2.39	1.89	1.53	1.27	1.06					
	Suction	4.02	2.95	2.26	1.79	1.45	1.20	1.01					
125 mm	Pressure	5.41	3.98	3.05	2.41	1.95	1.61	1.35	1.15	0.99	0.87		
	Suction	5.03	3.69	2.83	2.23	1.81	1.50	1.26	1.07	0.92	0.80		
150 mm	Pressure	6.23	4.86	3.72	2.94	2.38	1.97	1.65	1.41	1.21	1.06	0.93	0.82
	Suction	5.97	4.39	3.36	2.66	2.15	1.78	1.49	1.27	1.10	0.96	0.84	0.74
200 mm	Pressure	6.80	5.83	5.09	4.02	3.26	2.69	2.26	1.93	1.66	1.45	1.27	1.13
	Suction	6.80	5.80	4.44	3.51	2.84	2.35	1.97	1.68	1.45	1.26	1.11	0.98
		Serviceability Limit State											
50 mm	Pressure	1.58											
	Suction	0.88											
75 mm	Pressure	3.14	2.24	1.63	1.22								
	Suction	2.50	1.70	1.14	0.68								
100 mm	Pressure	4.92	3.60	2.69	2.05	1.59	1.24	0.99					
	Suction	4.19	2.98	2.15	1.58	1.17	0.83	0.55					
125 mm	Pressure	6.83	5.11	3.89	3.01	2.36	1.88	1.51	1.23	1.01			
	Suction	6.04	4.41	3.28	2.47	1.89	1.46	1.13	0.89	0.65			
150 mm	Pressure	8.85	6.72	5.19	4.07	3.23	2.59	2.10	1.72	1.43	1.19	1.00	0.85
	Suction	8.01	5.97	4.52	3.47	2.70	2.12	1.68	1.34	1.08	0.88	0.70	0.53
200 mm	Pressure	13.04	10.12	7.98	6.37	5.15	4.20	3.46	2.88	2.41	2.03	1.72	1.47
	Suction	12.12	9.28	7.22	5.69	4.53	3.64	2.95	2.41	1.99	1.65	1.38	1.15

technical
span tables

Double Span Condition

Panel thickness (mm)	Load type	Uniformly distributed loads kN/m² Span L in metres											
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
		Ultimate Limit State											
50 mm	Pressure	2.07	1.52										
	Suction	2.05	1.51										
75 mm	Pressure	3.16	2.32	1.78	1.40								
	Suction	3.05	2.24	1.71	1.35								
100 mm	Pressure	4.25	3.12	2.39	1.89	1.53							
	Suction	4.02	2.95	2.26	1.79	1.45							
125 mm	Pressure	5.41	3.98	3.05	2.41	1.95	1.61						
	Suction	5.03	3.69	2.83	2.23	1.81	1.50						
150 mm	Pressure	6.23	4.86	3.72	2.94	2.38	1.97						
	Suction	5.97	4.39	3.36	2.66	2.15	1.78						
200 mm	Pressure	6.80	5.83	5.09	4.02	3.26	2.69	2.26					
	Suction	6.80	5.80	4.44	3.51	2.84	2.35	1.97					
		Serviceability Limit State											
50 mm	Pressure	1.63	1.12										
	Suction	1.31	0.75										
75 mm	Pressure	2.64	1.77	1.27	0.96								
	Suction	2.57	1.43	0.87	0.56								
100 mm	Pressure	3.74	2.46	1.73	1.29	1.00							
	Suction	3.55	2.35	1.40	0.89	0.59							
125 mm	Pressure	3.87	3.17	2.21	1.63	1.25	0.99						
	Suction	3.50	2.99	2.04	1.28	0.84	0.57						
150 mm	Pressure	3.88	3.29	2.69	1.96	1.49	1.17						
	Suction	3.46	2.94	2.55	1.55	0.99	0.65						
200 mm	Pressure	4.22	3.56	3.09	2.60	1.95	1.52	1.21					
	Suction	3.71	3.14	2.74	2.13	1.28	0.78	0.48					

Notes:

1. Values have been calculated using the methods described in BS EN 14509:2006 titled 'Self-supporting double skin metal faced insulating panels (light coloured) - Factory made products - Specifications', taking imposed loads and temperature into account.
2. The serviceability limit state is defined by local buckling, bending or crushing failure at an intermediate support or the exceedance of a specified deflection limit.
3. The table is for an internal temperature of 0°C.
4. A deflection limit of L/100 was used.
5. The actual wind suction load resisted by the panel is dependant on the number of fasteners used and the support thickness as well as the fastener material. These tables are based on a support width of 60mm.
6. The fastener calculation should be carried out in accordance with the appropriate standards. For further advice please contact Kingspan Technical Services.
7. The allowable steelwork tolerance between bearing planes of adjacent supports is +/- 5mm.
8. Load span tables for the panel specifications not shown are available from Kingspan Technical Services.

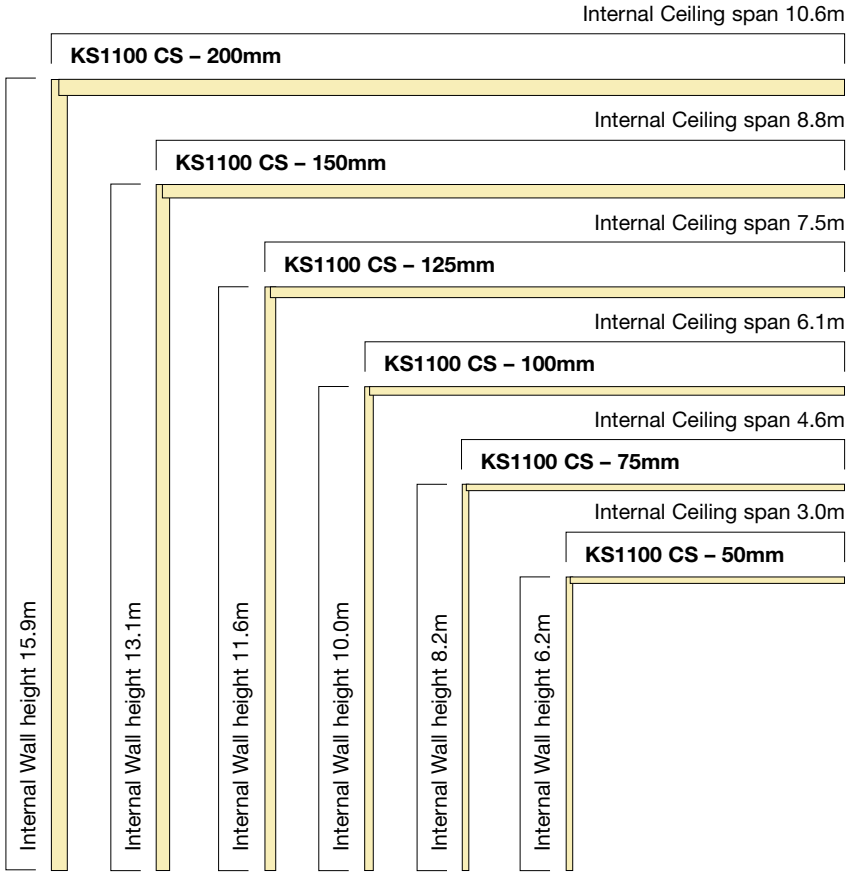
technical span tables

Internal Wall and Ceiling Spans

Internal wall spans are based on the following:
Pressure or Suction Load of 0.3kN/m^2. Temperature difference across the panel is 0˚. Deflection limit L/100 short term.

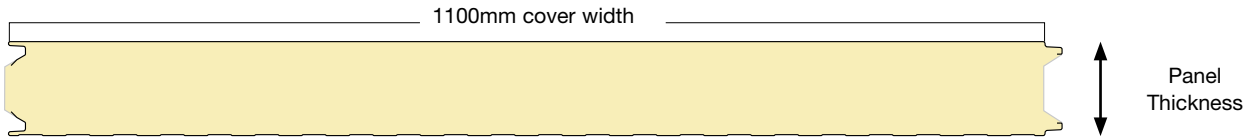
Internal ceiling spans are based on the following:
Imposed load of either 0.25kN/m^2 or a 1.4kN concentrated load as per AS1170.1:2002. Imposed loads are taken as short term only. Temperature difference across the panel is 0˚. Deflection limit L/200 short term and L/100 long term.

General
Spans have been calculated using methods described in AS1170 as well as EN14509:2006 - 'Self-supporting double skin metal faced insulating panels - Factory made products'. For all other temperature differential situations, please contact Kingspan Technical Services.

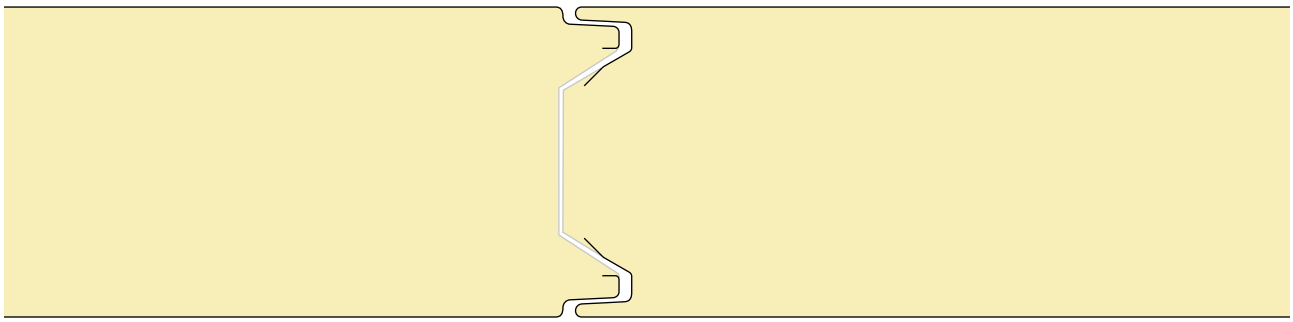


Please note that for orders outside of Australia maximum lengths are 11.8m

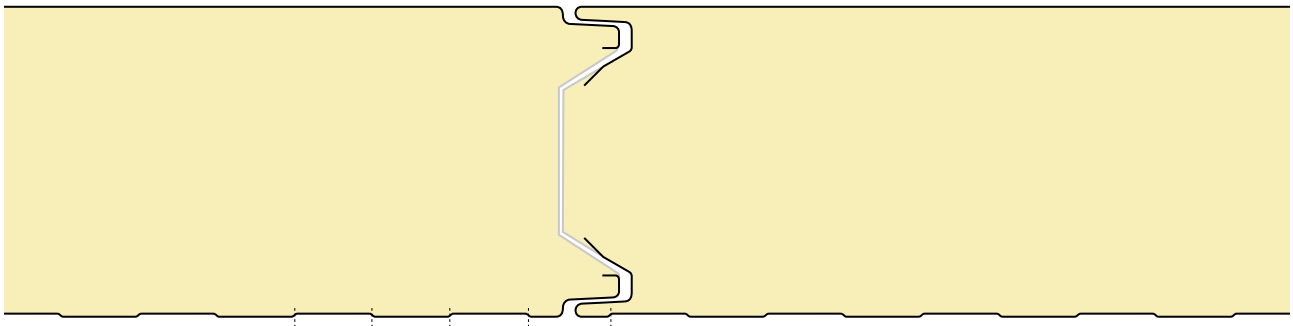
technical
product profile



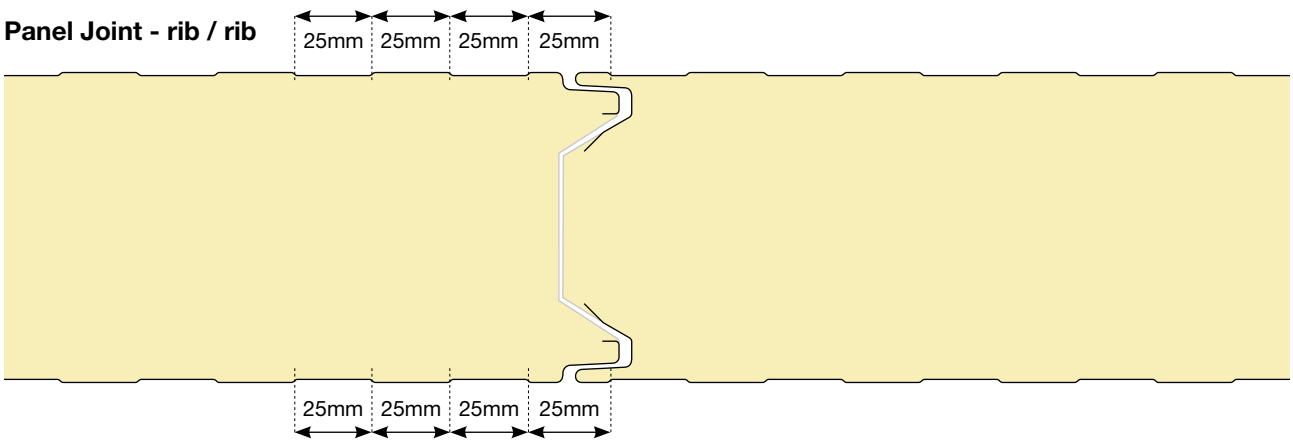
Panel Joint - flat / flat



Panel Joint - flat / rib



Panel Joint - rib / rib

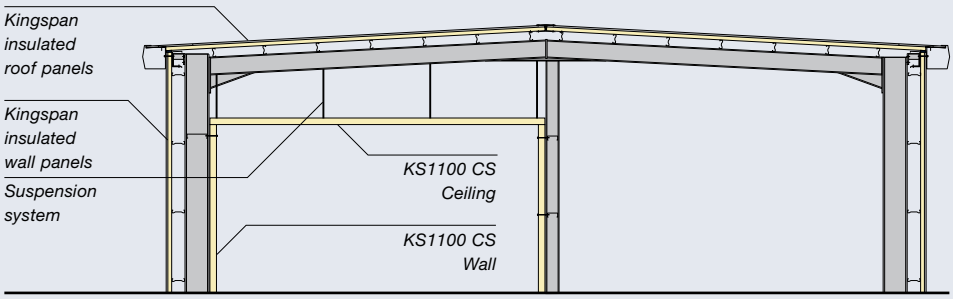


technical construction details

Typical construction types

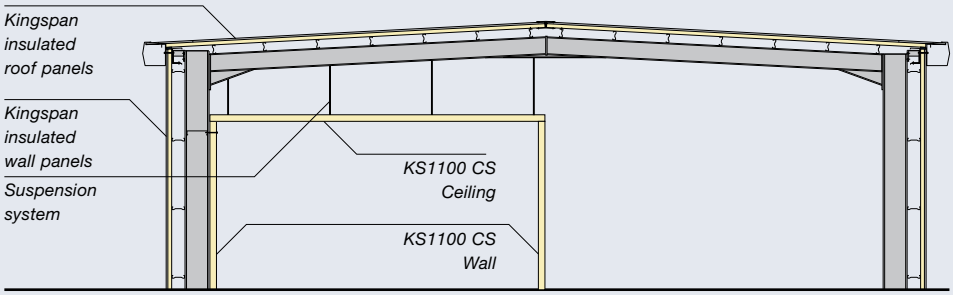
Internal Insulated System with Purpose Built Support Framing

Main Structure: Portal or Truss Construction



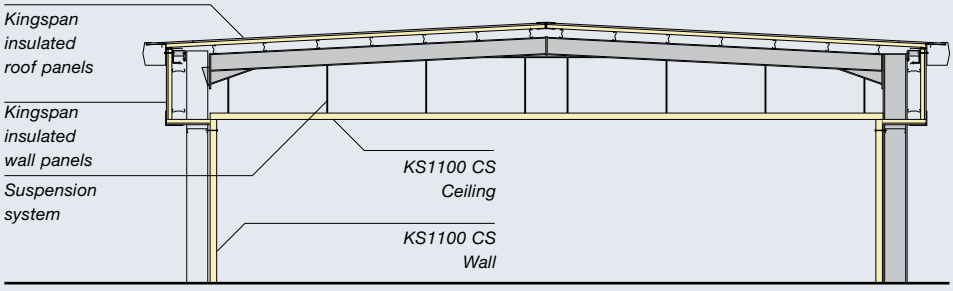
Internal Insulated System Self-Supporting

Main Structure: Portal or Truss Construction



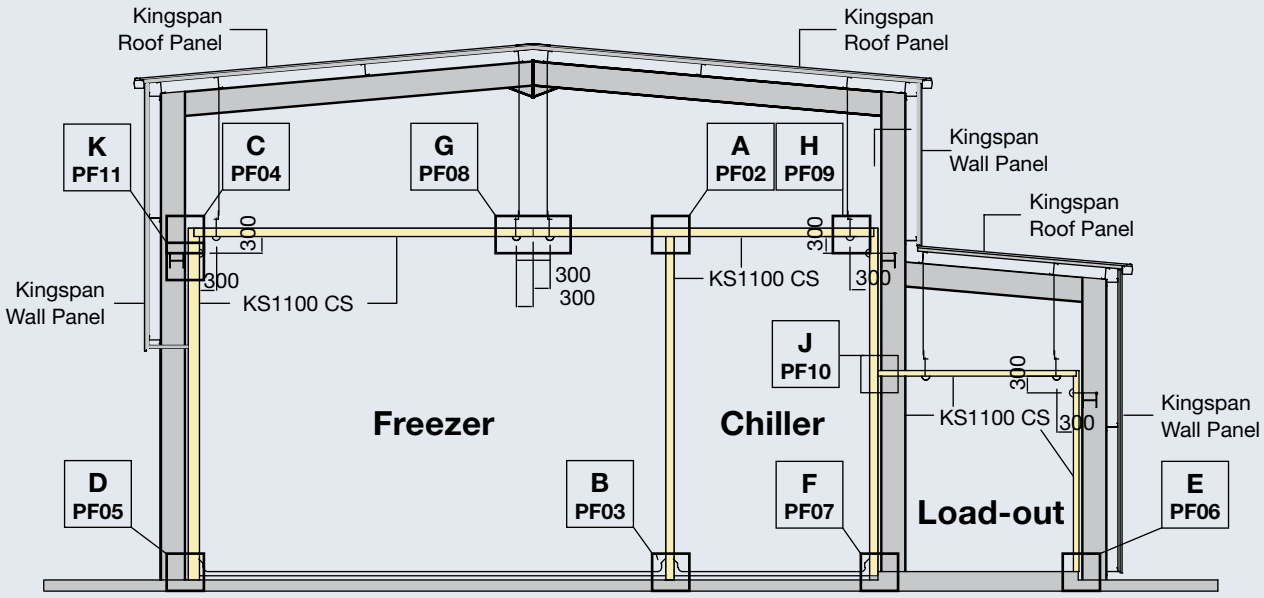
Internal Insulated System with Partial External Wall Cladding

Main Structure: Portal or Truss Construction

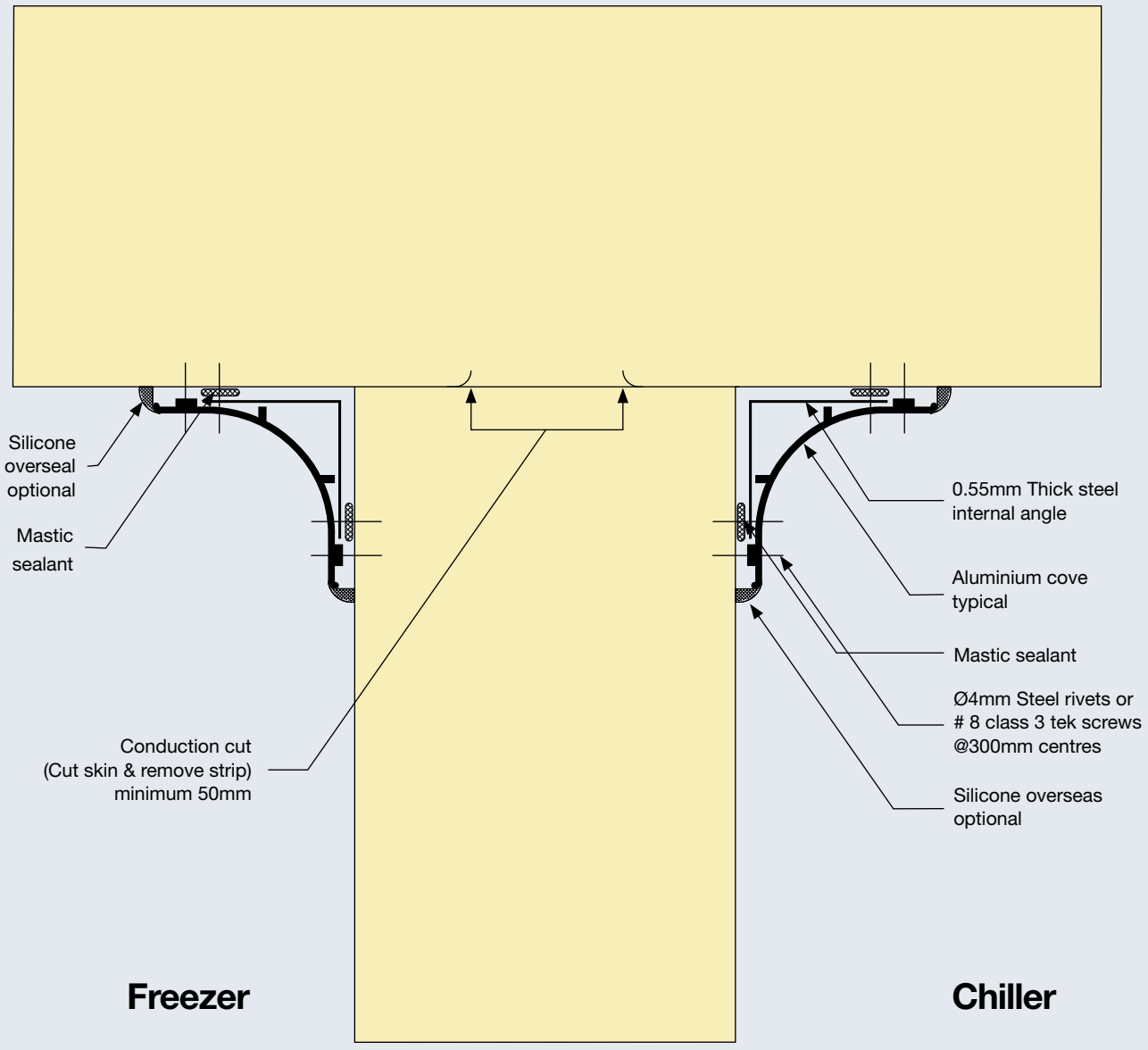


typical section through a cold store building

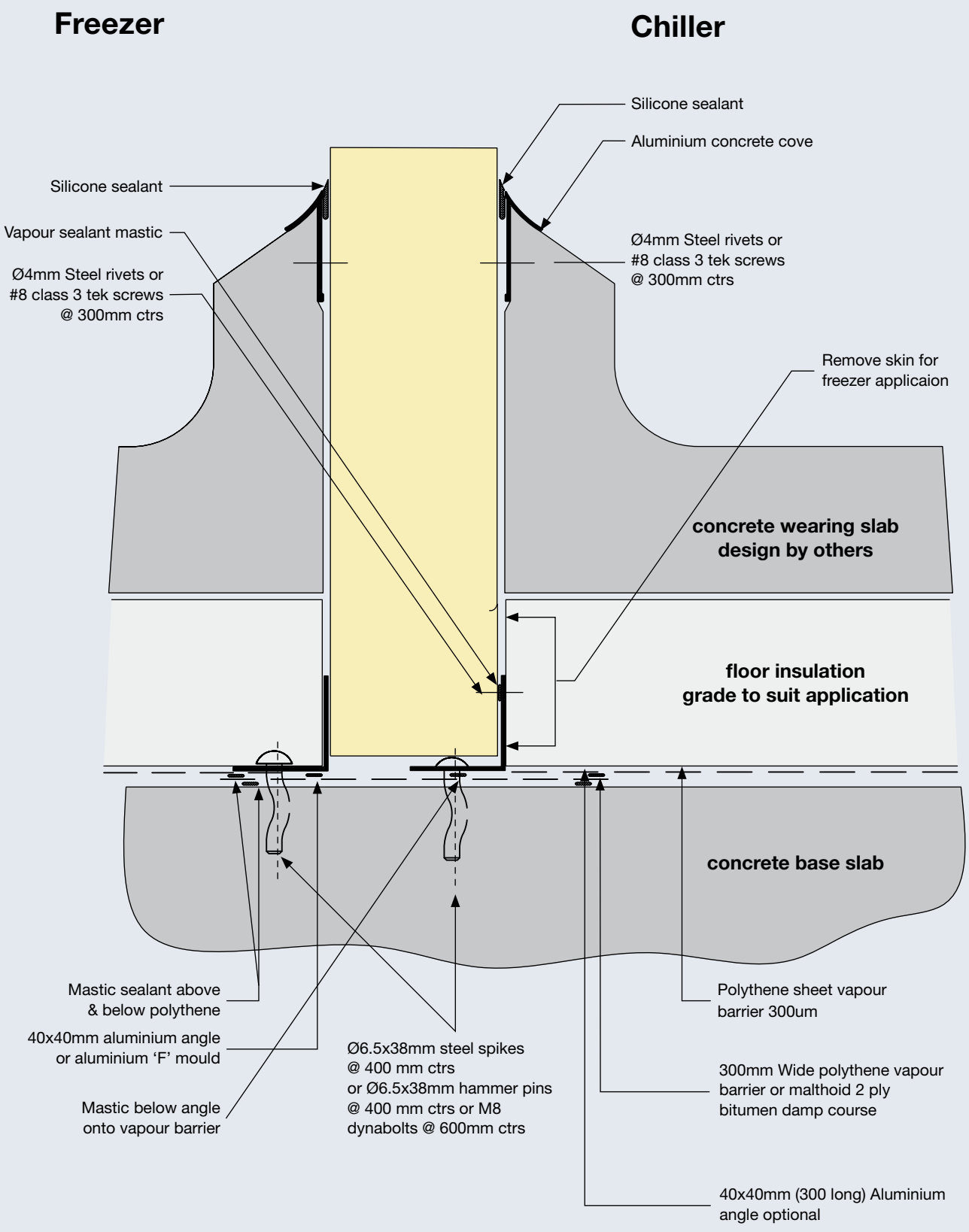
The following details relate to KS1100 CS in Coldstore and Freezer applications. For construction details relating to ambient and clean room installations please contact Kingspan Technical Services.



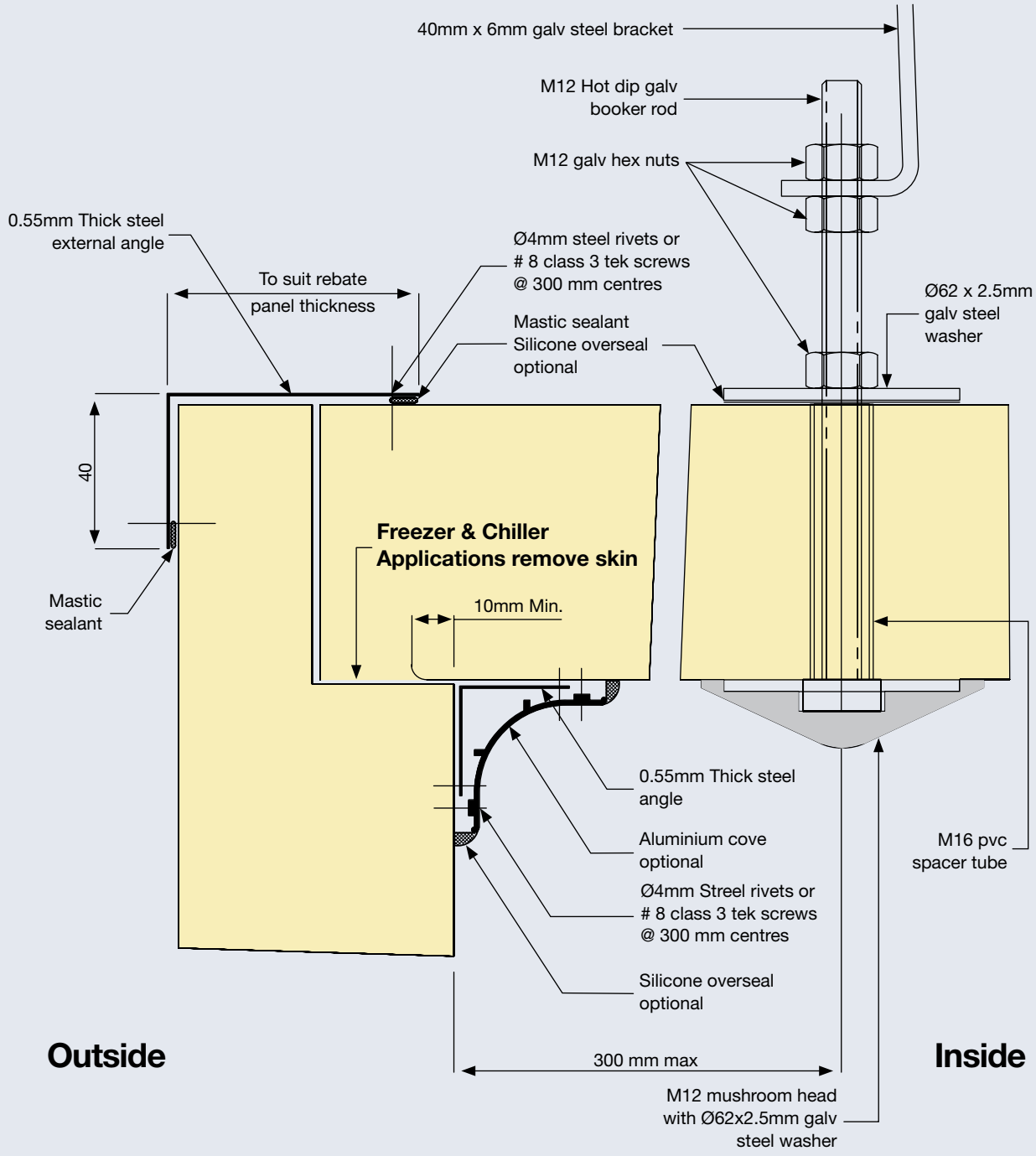
partition to ceiling / wall joint detail A PF02



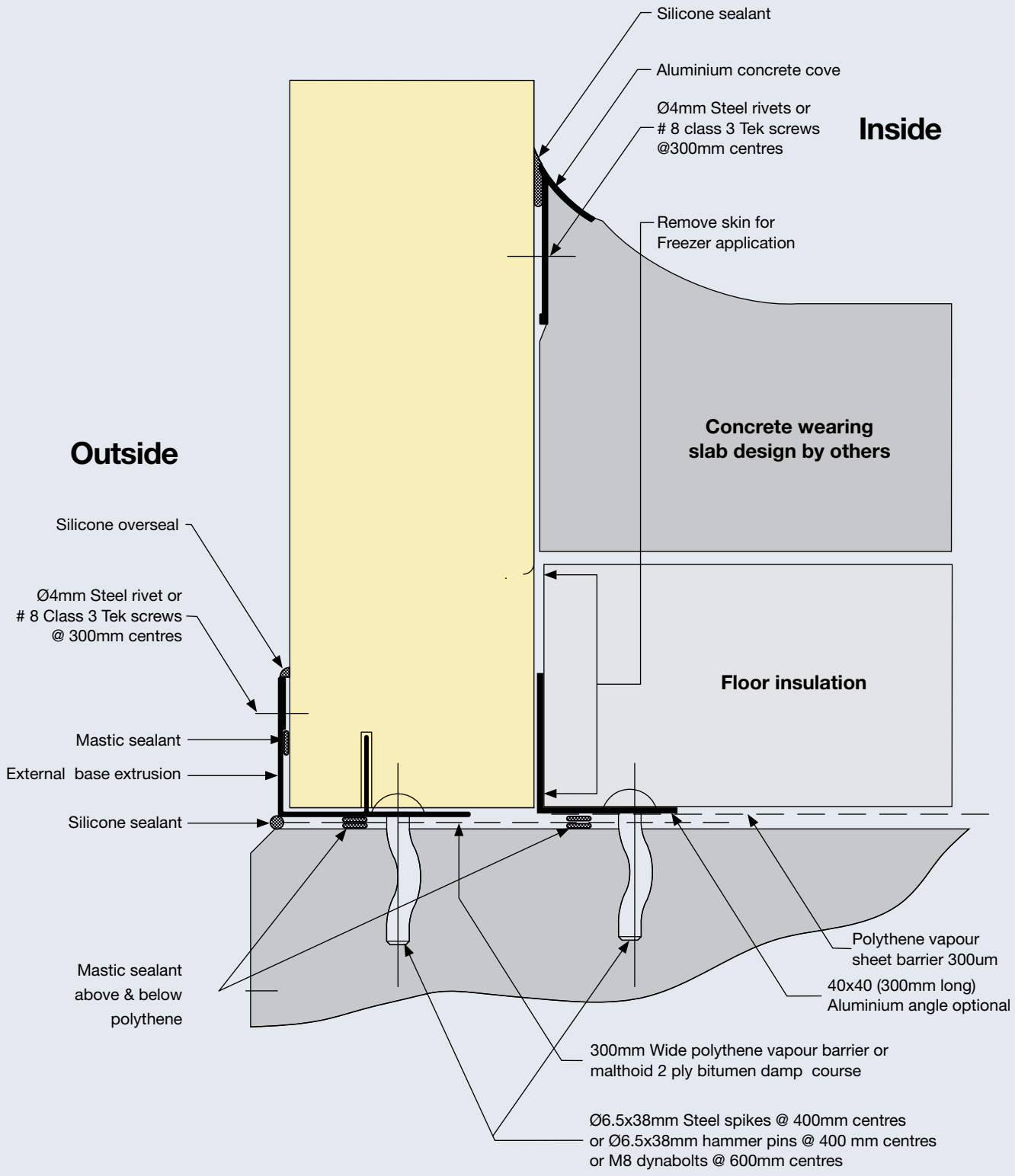
partition wall to floor joint insulated floor detail B PF03



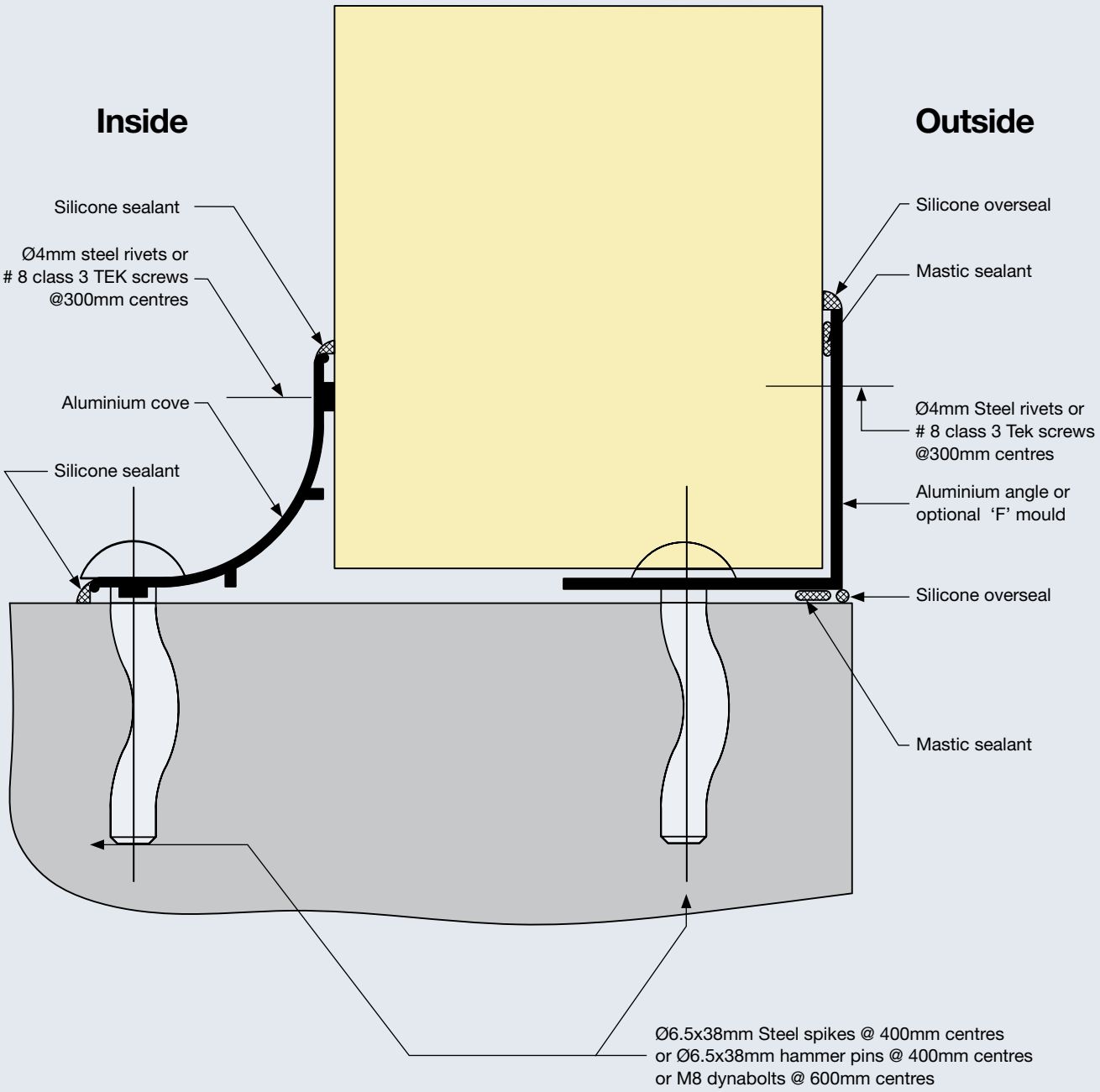
wall to ceiling joint
detail C PF04



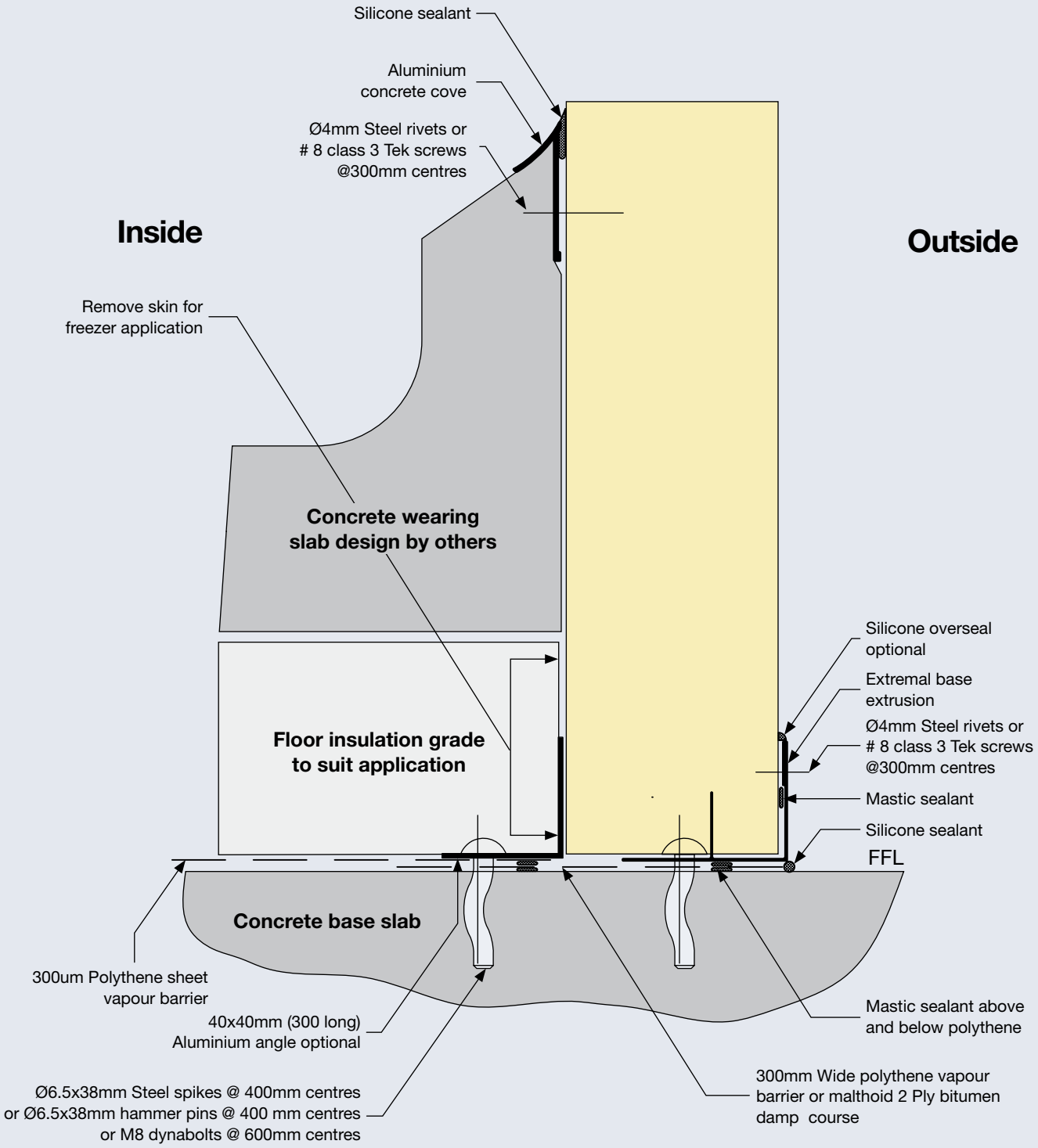
wall to insulated floor joint detail D PF05



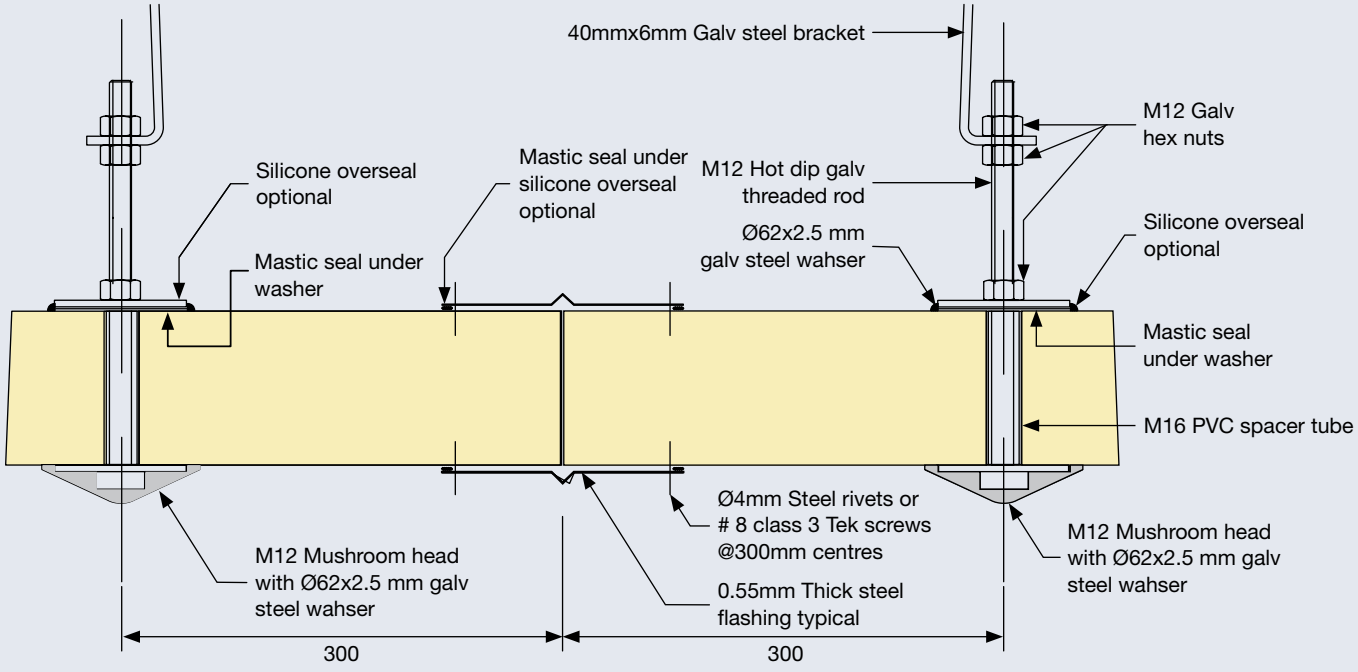
wall to non insulated floor joint detail E PF06



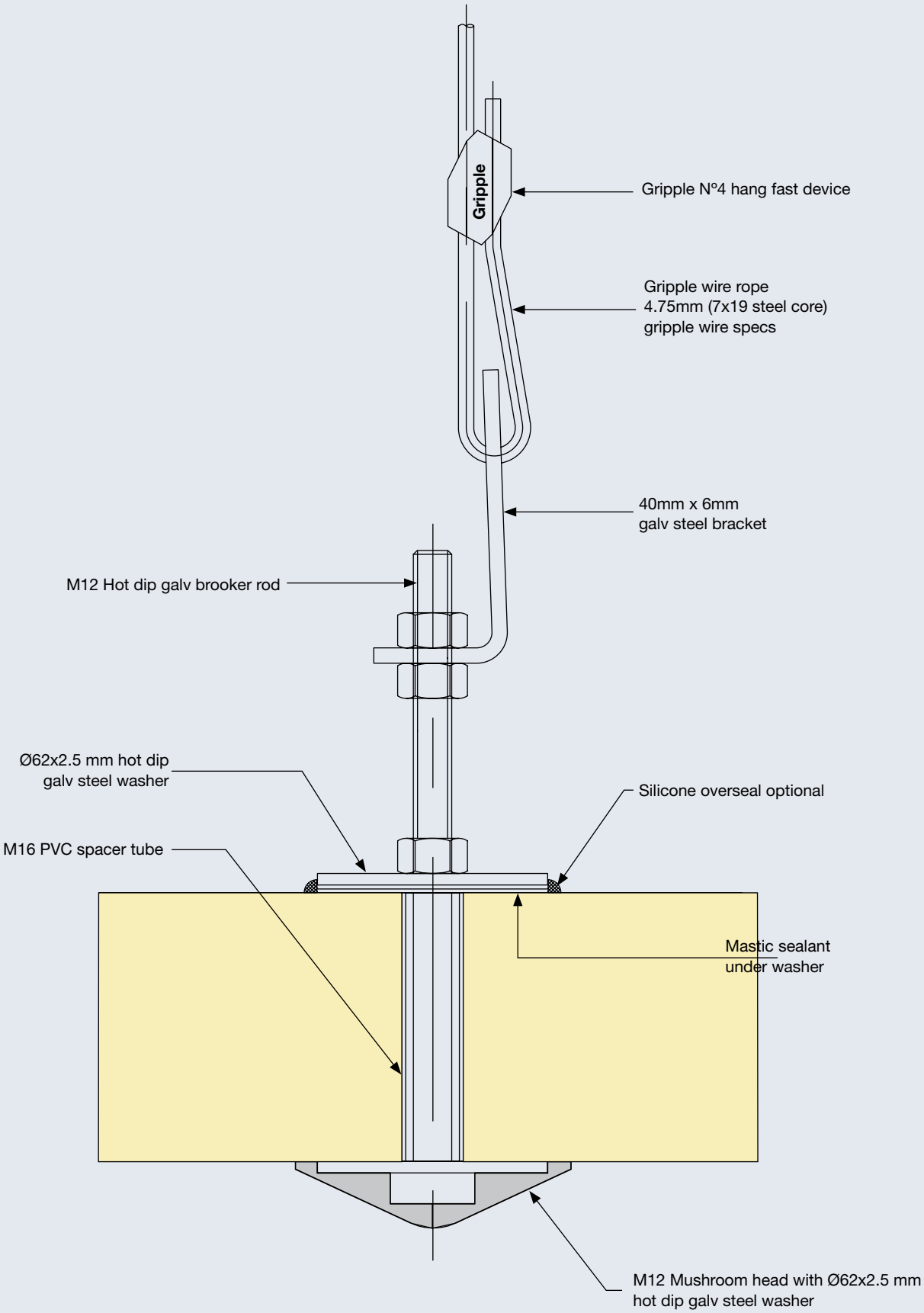
wall to insulated floor joint detail F PF07



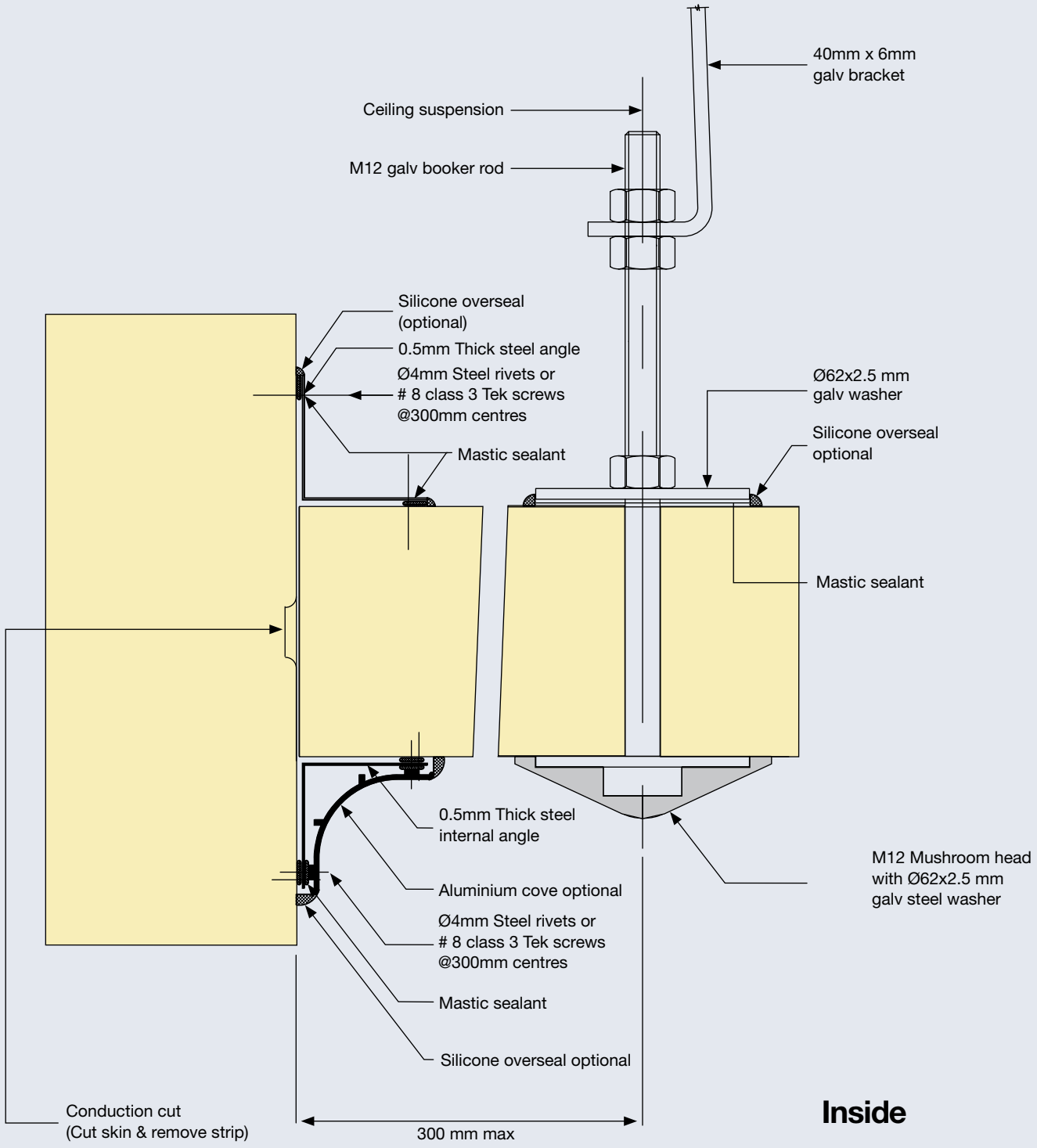
main ceiling suspension
detail G PF08



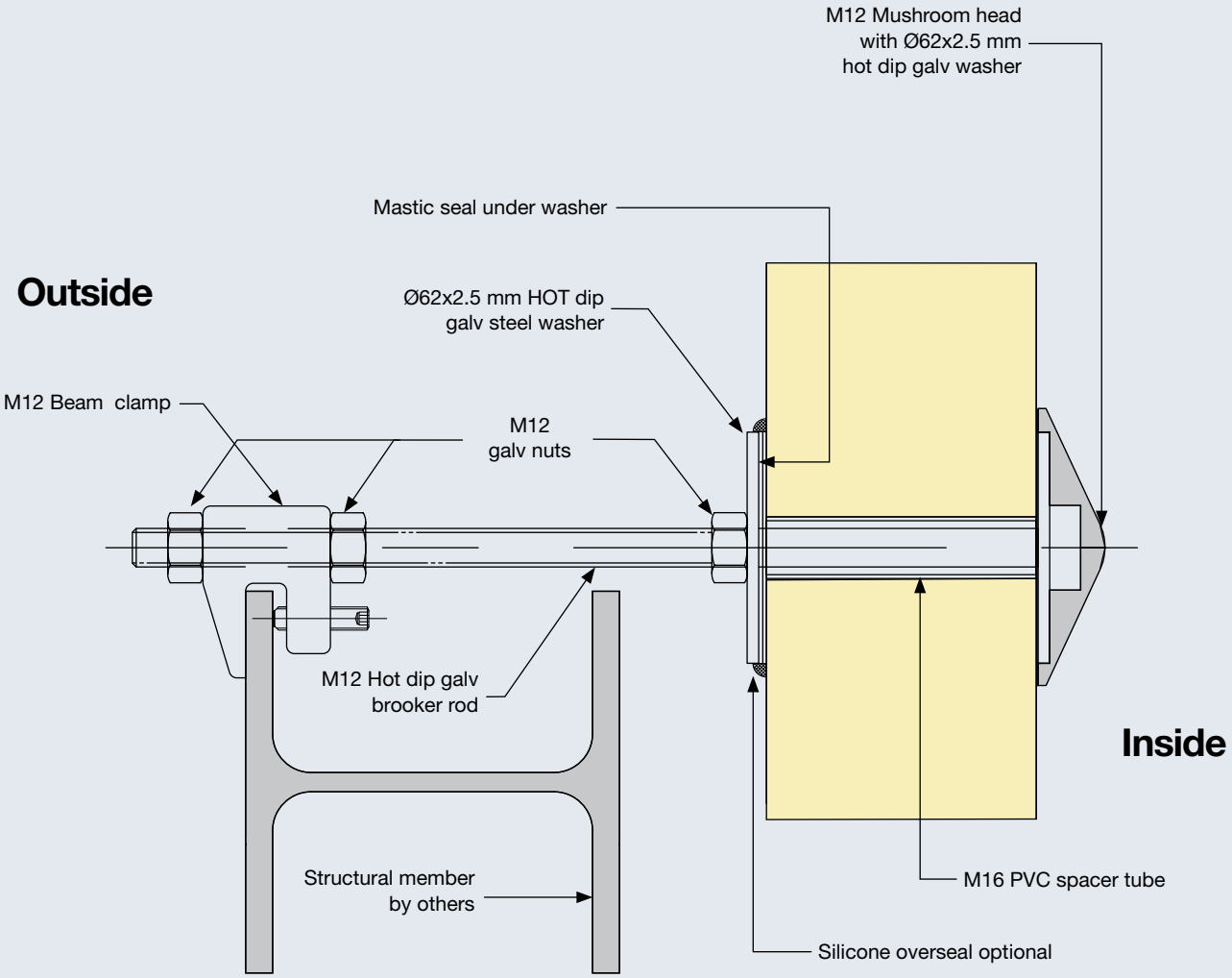
intermediate ceiling suspension detail H PF09



ceiling suspension detail J PF10



intermediate wall panel support fixing detail, ext. walls detail K PF11

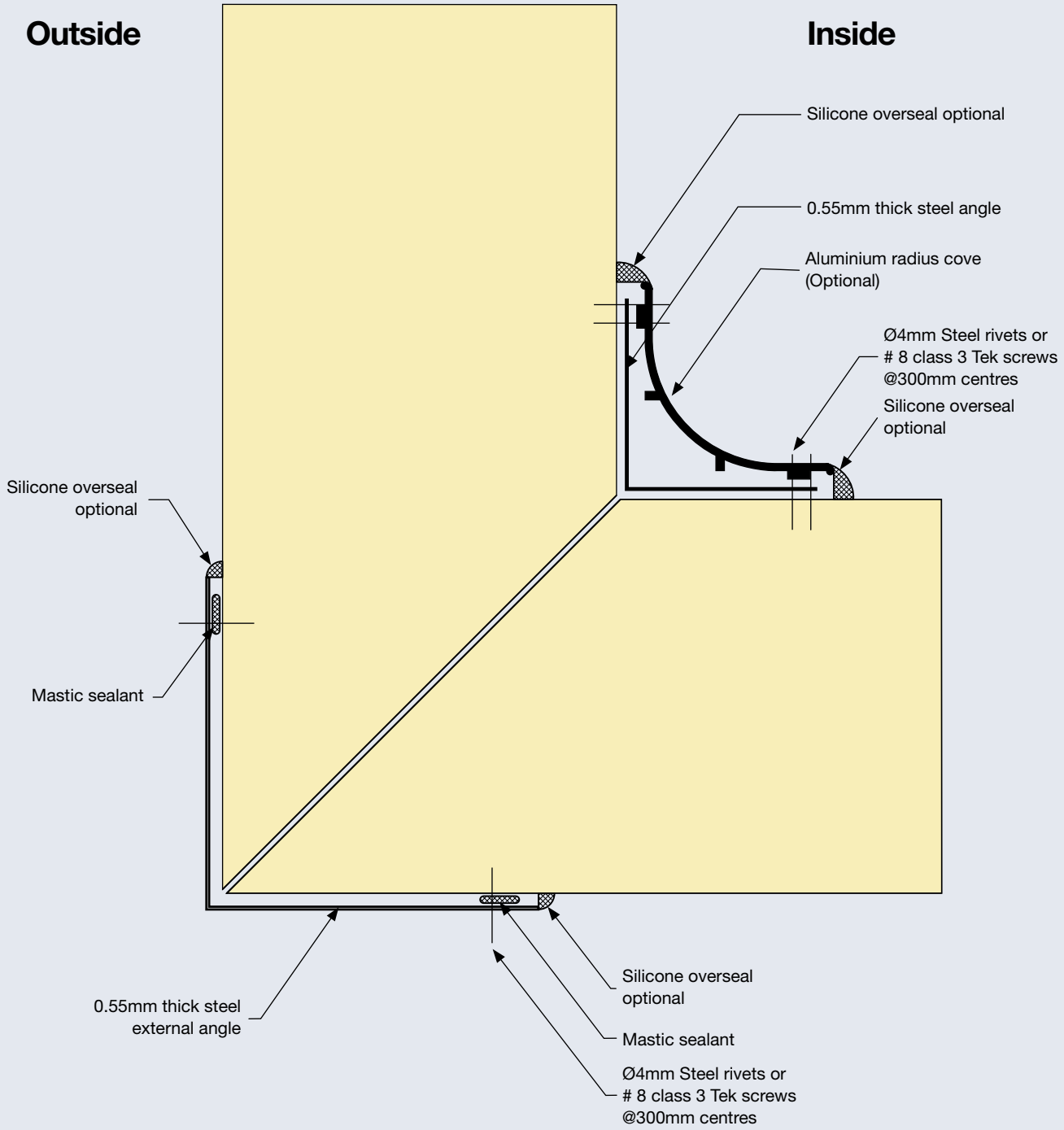


NOTES

1. Fixing may need to be varied to allow for thermal bow of wall panel in some cases.

2. Number of girt fixings per panel can vary with wind loads.

wall to wall joint detail L PF12



Performance
The core issues

The construction of a controlled environment has to take into consideration a range of different factors and demands, which are becoming more complex as techniques, attitudes and legislation evolves in design and construction.

Fire performance, energy efficiency, life-time cost, and sustainability are all critical areas that can be greatly impacted by the materials and systems used in the construction.

There are a variety of insulation core options available in the market including expanded polystyrene (EPS), modified EPS, Polyurethane (PUR) and Polyisocyanurate (PIR). High quality PIR panels perform the best overall in terms of sustainability, fire performance and thermal performance aligned to weight / thickness / efficiency of build. The closed cell structure of PIR means that it is resistant to moisture and therefore eliminates water ingress that can cause other core panels to deteriorate. The absence of any water or moisture also means that no toxic mould or bacteria can grow. All this contributes to a long life expectancy.

Kingspan have worldwide expertise in the manufacture and use of controlled environment panels.

energy performance

Controlled environments

Controlled environments (particularly Cold/Chill Stores) tend to consume significant amounts of energy and the greater the thermal efficiency of a modular box or controlled environment both in terms of insulation and air tightness, the larger the savings.

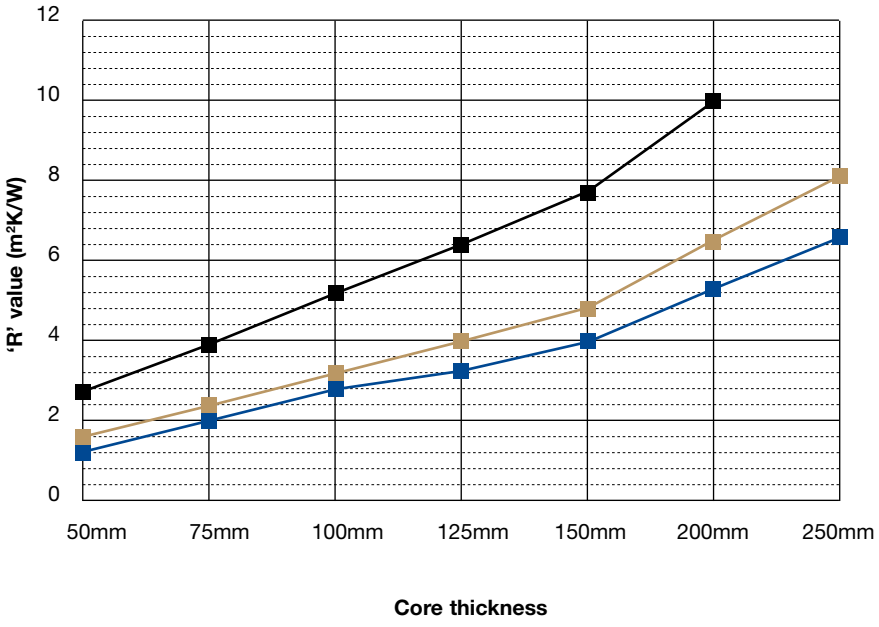
A high performing building can assist in dramatically reducing the consumption of energy allowing for minimal air leakage and more effective design and use of HVAC plant. This reduces operational energy costs (which are on the rise) and in turn reduces carbon emissions and global warming.

Kingspan panels are guaranteed to retain their thermal performance for the life of the product thereby helping to ensure that the building energy performance rating is maintained throughout the life of the building.

Comparison graph comparing insulation types*

- Kingspan PIR (Polyisocyanurate)
- EPS (expanded polystyrene)
- Modified EPS

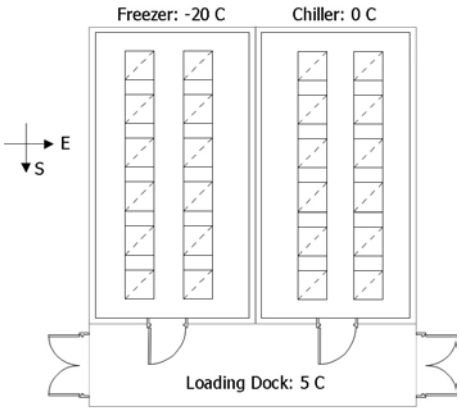
** based on advertised data*



Energy Performance

Case Study:

Thermal Performance analysis of Kingspan KS1100 CS wall and ceiling panels compared to Expanded Polystyrene (EPS) in a Cold Room and Chiller. Based on a typical cold store facility the test modelled includes a Freezer, Chiller Room and loading Dock.



Test parameters	Freezer	Chiller
Room Dim. (mtrs)	25 x 100 x 10m	25 X 100 X 10m
Panel Thickness (mm)	200mm	100mm
Core Materials Tested	Kingspan PIR v EPS	Kingspan PIR v EPS
Location	Brisbane & Melbourne	Brisbane & Melbourne

Test Outcomes

Results show that Kingspan KS1100 CS Panel significantly reduce:

- Room Transmission Loads[1] of approx 40-45%
- Total Refrigeration Load[2] by 20% in summer and 12% in winter

These reductions translate to energy savings and lower CO_2 emissions

Energy Savings

Energy costs are forecast to increase - and not just by only a little. Over the next five years the large scale electricity price are forecast to look like this*:

- New South Wales: 55% increase
- Queensland: 64 - 87% increase
- South Australia: 35% increase
- Victoria: 57% increase

When you consider what the cost of energy could rise to, the savings delivered are impossible to ignore.

Energy Savings per year		
Examples	**2010**	**2015**
Melbourne	$24,500	$39,300
Brisbane	$17,500	$32,500

Energy consumption savings are based on average refrigeration COP of 2-2.5 for the freezer load and 3-3.4 for the chiller load. Deterioration of EPS thermal performance has not been factored into the above results

Reducing greenhouse emissions isn't just an industry issue but an environmental responsibility.

Kingspan PIR panels provide solutions for the construction of sustainable buildings, which achieve significant energy savings and reduce CO_2 emissions.

CO_2 Emission**	12months	15 years
Melbourne	109,273 $kgCO_2$	1,639,095 $kgCO_2$
Brisbane	77,814 $kgCO_2$	1,167,210 $kgCO_2$

* *Source; Australian Energy Regulator, Ezine (March 2010)*

** *Based on 0.89$kgCO_2$/kWhr, Study undertaken by Minus40.*

Definitions

[1]Transmission load is the heat transferred into the room(s) through walls, floor and ceiling. It depends on type of insulation (conductivity), thickness of insulation, outside wall area and temperature difference inside and outside.

Transmission load is considered positive if heat goes into the room (inside temperature < outside temperature).

[2]Total Refrigeration Load is the key design parameter for refrigeration system selection. It includes the following:

- *Transmission load;*
- *Product Heat load – heat which has to be rejected from the product stored in the cool room;*
- *Internal load – includes heat produced by internal equipment (lighting, fan motors, people working in the room,);*
- *Infiltration load – heat gained associated with air entering into the room from outside (through the doors, receiving/dispatch docks etc.);*
- *Equipment related load – heat which dissipates from the equipment working in the room(s) (forklifts, trucks etc).*

Electrical power consumption to operate a refrigeration system which provides Refrigeration Load can be estimated as Refrigeration Load/Coefficient of performance. COP of refrigeration system depends on the system type, temperature in the cool room and varies with ambient temperature (can be 1.5-5).

environmental performance

Kingspan Insulated Panels is the world's largest producer of insulated panels. Each year it reports on the social, economic and environmental sustainability measures taken within an increased number of manufacturing sites around the world. The Kingspan Insulated Panels manufacturing site in Sydney Australia is included in this.

Global Reporting on Sustainable Performance

The Global Reporting Initiative (GRI) has pioneered the development of the world's most widely used sustainability reporting framework from its conception in 1997. This framework sets out the principles and indicators that organisations can use to measure and report on their economic, environmental and social performance.

A commitment to this reporting framework leads to improved sustainable outcomes for Kingspan Insulated Panels as it permits Kingspan to declare, measure, track and improve its performance on specific sustainability issues.

Life Cycle Assessment and Carbon Footprint

In 2010/2011 Kingspan in Australia completed life cycle impact assessments for its roofing, walling and controlled environment panel systems manufactured in Australia. Life Cycle Assessment (LCA) assesses the environmental impact of Kingspan's products at all stages of their life from 'cradle to grave', by examining all relevant energy and raw material inputs, and items which impact on the environment. This is summarised in a standardised form as an Environmental Product Declaration (EPD). Kingspan has completed an EPD for its Australian manufactured KS1100 CS controlled environment panels, which applies to Australian and New Zealand markets.

EPDs offers building owners and architects a method for the selection of building products for building design and construction, based on the known environmental impact of the building's material constituents and the performance of each product over the life of the building. For Kingspan customers this means that they are using products from a panel manufacturer with

- Regular global reporting on sustainability performance (Global Reporting Initiative)
- Low environmental impact for all products
- EPDs for all products – independently assessed and compliant to ISO 14040 and ISO 14044.

Today buildings are being designed from the ground up using such processes as Building Information Modelling (BIM) technology and similar, in order to determine the entire life cycle impact of the building at the building design stage. Fundamental to this concept is individual product selection and knowing all aspects of the individual products and materials to be used in the building, from constituent components used in each product, their longevity, environmental impact and lifetime performance.

The construction of sustainable buildings and building energy modelling emphasise the importance of the Kingspan 'envelope first' approach to building design. Over the life cycle of a building, the most significant impact on energy efficiency begins at an early stage in the life of the building – the selection of the building fabric.

Kingspan have found that the biggest savings for customers in using KS1100 CS controlled environments products, is that they offer substantially higher thermal performance than competitive products due to the unique PIR construction methodology.

Thus customers have the choice of future proofing their building with sustainable building products with almost double the R value in the same thickness package as some competitive products.

Green Building Council Green Star Ratings

green building council australia
MEMBER 2011-2012

MEMBER 2011–2012 NZGBC

Kingspan products are frequently selected for inclusion in Green Star rated buildings, and have attributes that are aligned with the Green Star philosophy for the environmental rating of buildings.

Kingspan Insulated Panels can contribute to the overall Green Star rating for a building in a number of areas:

Category : Energy
Thermal simulation of the building with high performance Kingspan PIR panels will show energy and greenhouse gas savings in comparison to traditional building materials.

Category : Material
Kingspan panel systems are designed for disassembly.
Composite insulated panels have low mass, and together with their efficient, low-waste, factory prefabrication and cut-to-length provisions will reduce waste on-site.

Category : Emissions
Kingspan insulated panels contain no chlorofluorocarbons or hydrochlorofluorocarbon compounds which contribute to GHG emissions.

Category : Waste Management
Kingspan low mass products require lighter frame structures which can contribute to less excavation and soil disposal, and hence waste reduction, on site.

approved environmental profile

controlled environment

COMPLIANT WITH ISO 14040 / ISO 14044 AND BP LCI METHODOLOGY

Characterised, Normalised and Weighted Data for:
1 square metre of Installed Controlled Environment: Kingspan Insulated Panels KS1100 CS Panel with 100mm polyisocyanurate insulation core. External facing zinc / aluminium pre-painted coated steel. Internal facing zinc / aluminium pre-painted coated steel.

Quality of data for certified material :

Source of Data	Kingspan Company Records, 2010
Data Analysis	Edge Environment
3rd Party Critical Review	PE INTERNATIONAL
Geography	Australia
Representativeness	1 Site representing 100% of Kingspan Australian product

LCA Methodology
This is a Kingspan ISO14021 Type II self-declaration summary, independently assessed by Edge Environment, and peer reviewed by PE INTERNATIONAL, in compliance with ISO 14040 / 14044 and making use of the BP LCI methodology. It is compatible with the requirements of an ISO14025 Type III product declaration.

Life cycle impact data
Cradle to grave over a 40 year life, excluding impacts from any heat loss through the panel (full environmental details available from Kingspan on request)

Reference : KS-RWaust1-2010

Impact Category	Characterised Units	Characterised Performance	Normalised Performance (dimensionless)	Weighted Performance (dimensionless)
Global warming	kg CO2 eq	62.1	0.23%	0.048
Eutrophication	kg PO4 eq	0.12	0.65%	0.019
Acidification	kg SO2 eq	0.84	0.75%	0.030
Photochemical smog	kg NMVOC eq	0.25	0.34%	0.010
Ozone depletion	kg CFC-11 eq	3.1E-06	0.17%	0.0068
Ionizing radiation	kg U235 eq	1.7	0.13%	0.0026
Respiratory effects	kg PM2.5 eq	0.13	0.27%	0.0080
Human toxicity				
Non-carcinogenic	DALY	2.2E-06	0.06%	0.00088
Carcinogenic	DALY	2.1E-07	0.05%	0.00074
Eco-toxicity				
Fresh water aquatic	PDF	4.1E-12	0.01%	0.00075
Marine aquatic	PDF	3.2E-09	0.18%	0.022
Terrestrial	PDF	4.5E-12	0.20%	0.012
Abiotic resource depletion				
Non-renewable fuels	kg oil eq	23.3	0.15%	0.0044
Minerals	kg Fe eq	2,466	0.01%	0.00033
Land occupation and transfer	Ha a	9.3E-05	0.00%	0.000061
Water use	kL H2O	1.9	0.21%	0.013
Total		(Au ecopoints -100 Ecopoints is equivalent to the annual impact of one Australian citizen)		**0.178**

This certificate remains the property of Kingspan Insulated Panels, is issued subject to Kingspan terms and conditions, and is maintained and held in force through annual review and verification where applicable, and until such times as the product environment assessment data changes.

Date approved:
19th February 2012

Signed

Kingspan Insulated Panels
M. G. Tatam

Signed on behalf of Kingspan Insulated Panels
Dr M.G. Tatam, Technical Manager

edge environment
N Howard

Signed on behalf of Edge Environment
Nigel Howard, Managing Director

PE INTERNATIONAL
Jane Anderson

Signed on behalf of PE INTERNATIONAL
Jane Anderson, Principal Consultant

illustrated; copy of Kingspan ISO compliant enviornmental profile

fire performance

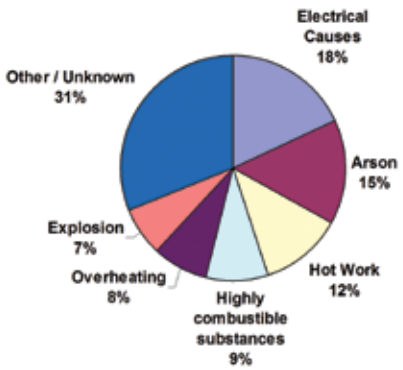
Controlled environments contain potential fire hazards as a result of the processes in operation and/or the materials handled in the facility. The Fire Performance of the building materials along with the design and installation methods used can help to minimise and control potential fire damage.

Prediction of Fire Performance

Determination of the fire performance of insulated panels is not a straightforward issue, due to the composite nature of the panels used. The performance in fire will depend on the properties of the facing (and backing) panel materials, and also those of the panel core material. Commonly used core materials are polystyrene, mineral wool, polyurethane, polyisocyanurate, phenolic and hybrid polystyrene composites. All of these products behave differently in the event of a fire, and there are performance trade-offs in terms of other properties required, in the selection of panels in controlled environment applications.

A fundamental problem in ascertaining fire performance is that the facings (if steel for example), can protect the core from fire exposure and thereby vastly alter the true performance in fire from the situation when the core is either partly or fully exposed. A dependence on the correct installation of many systems can therefore have a significant effect on the way panels perform in fires. A poor installation or one subsequently modified with penetrations or other work, and which exposes the core material, may perform significantly worse in the case of a fire.

The following table (reproduced from German Insurance data) shows some of the potential hazards that may lead to fire events.



Many of these causes are difficult to predict or control, and therefore panel systems with material cores that offer poor fire performance will always present some level of risk in the event of a fire.

Also problematic is that fire behaviour of small fires is different from that of large fires. Given that many of the fire tests that assess the 'performance' of panels for building regulatory codes are small scale tests, then these can be argued as not being physically representative of large real life fire performance. Real life fire performance can only be accurately estimated by the use of full-scale fire tests.

Fire Hazard Properties

Fire hazard is defined in the Building Code of Australia (BCA) as the danger (to life) in terms of potential harm and degree of exposure arising from the start and spread of fire, and the smoke and gases that are thereby generated. In order to meet the 'deemed to satisfy' provisions of the relevant BCA sections, fire testing of products is required. The fire hazard testing standard provisions listed in the BCA relevant to insulated panels are:

AS NZS 1530.3 Methods for fire tests on building materials, components and structures - Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release.
This is a small scale fire test that provides the listed test indices as a measure of the fire hazard performance of materials. This test is being phased out of the BCA in favour of larger scale fire tests.

AS ISO 9705 Fire tests – Full-scale room test for surface products. A small room constructed of non-combustible material is lined internally with the product under test, and a controlled ignition / fire source is placed inside the room. The test measures heat and smoke release rates, in determining the product Group numbers, which are a measure of fire hazard risk.

All materials that are used as a finish, surface, lining or attachment to walls or ceilings are required to be tested to ascertain a Group Number from 1 – 4, which provides an assessment of their fire hazard properties. A Group 1 rating provides the best fire performance and Group 4 the worst. The BCA lists, for the different classes of buildings and the specific areas within a building, the minimum Group numbers which are required to meet the BCA's 'deemed to satisfy' provisions.

Resistance to fire

The fire resistance of a material describes its ability to resist the passage of heat and flames through its structure. The most important criteria in the case of insulated panel systems are the time to insulation and integrity failure. Fire resistance testing is normally done using a gas furnace using frame-mounted samples. The frame is typically 3m^2 which typically allows the mounting of 3 adjacent panels. The furnace temperature follows a standard temperature curve which typically gives temperatures of 678, 781, 842, 885, 918 and 945°C at 10-minute intervals up to 1 hour. The insulation failure is deemed to occur when the temperature of the non-fireside face exceeds the test specification requirements – typically around 200°C for insulated panel systems. Integrity failure is deemed to have occurred when flames are emitted from the non-fireside face. In Australia fire resistance testing is performed to Australian standard "AS1530 Part 4: Fire resistance tests on elements of building construction". In the UK the equivalent test is BS 476 Part 22 and in Europe the equivalent test is BS EN ISO 1364. All these tests have similar methodologies and give similar results. Kingpan panels systems are available that deliver up to 1 hour insulation and integrity performance. Fire resisting panels can play a key role in creating fire separation of different compartments and in helping ensure that external arson attacks do not enter the building.

Kingspan PIR After 30 minutes at over 1000°C

Section cut through the Kingspan PIR panel showing no fire propagation after 30 minutes

Kingspan PIR insulated panels remain unscathed after a major fire at a meat processing plant in 2010. Adjacent panels in EPS polystyrene (from another manufacturer) were incinerated.

fire performance

Kingspan and Fire Product Testing

Product testing to globally recognized standards such as Factory Mutual (FM) Global 4880 / 4881 and ISO 13874 (European standard specifically for insulated panel systems) are capable of more accurately depicting how fire will behave in realistic construction applications.

For this reason Kingspan KS1100 CS panels systems have been tested to, and are available with FM approved Unlimited Height certification.

FM APPROVED

Kingspan Insulated Panels continue to invest in better manufacturing processes and product development innovation in order to offer the highest standards in panel quality to the market. All panels contain a proprietary polyisocyanurate (PIR) insulation core, which offers superior fire performance when compared to most alternative insulation materials. PIR is a thermosetting material, which means that it does not melt, flow or drip when exposed to fire. Rather, it forms a strong char that protects the insulating core. Fire will not spread within the panels. Kingspan Firesafe PIR panels do not propagate fire and have been proven to greatly reduce the risk of total building loss.

Kingspan KS1100 CS panels systems are available with FM approved (unlimited height) specification details which ensure:

- Integrity of the structure is maintained.
- No spread of flame within the core.
- No flaming droplets which will spread fire (as with some insulation types)
- Low smoke emissions
- Product consistency in satisfying claimed fire performance.

Kingspan Fire Credentials

KS1100 CS Panels Fire Test Results

AS1530.4/BS476-22: 1987 Clause 5 (Walls)*

Thickness (mm)	**Integrity** (mins)	**Insulation** (mins)	**Kingspan model specification nr**
100	195	31	KSFW 04
125	195	31	KSFW 04
150	195	31	KSFW 04
200	240	64	KSFW 07

AS1530.4/BS476-22: 1987 Clause 9 (Ceilings)**

Thickness (mm)	**Integrity** (mins)	**Insulation** (mins)	**Kingspan model specification nr**
100	58	32	KSFW 05
125	58	32	KSFW 05
150	58	32	KSFW 05
200	148	67	KSFW 08

Notes: Specifications available on request.

* *Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction Clause 5: Determination of the fire resistance of partitions.*

** *Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction Clause 9: Determination of the fire resistance of ceiling membranes.*

Although not included in the testing above the 50mm and 75mm panels do provide a level of fire resistance and are FM approved.

Kingspan KS1100 CS panels have been tested to:

- AS/NZS 1530.3:1999 – Simultaneous determination of ignitability, flame propagation, heat release and smoke release.
- AS/NZS 1530.4:2005 (BS476:Part22) – Fire-resistance of elements of building construction.
- FM Approved to FMRC 4880 Class 1 – No height restriction (i.e. unlimited height).

(Information on request from Kingspan Technical services)

third party product accreditation (FM Global)

third party product accreditation (FM Global)

FM Global is an international property insurance and loss prevention engineering company. They assess insurance risk and premiums based on engineering calculations, as opposed to more historical actuarial based calculations in the insurance industry. Evaluation of building risk hazards, and working with their customers to advise of ongoing improvements to property or work practices is seen as the best practice industry approach to reducing physical and financial risks associated with building losses.

FM Global and Product Accreditation

Factors such as global climate change and the business need to quantify and reduce business risk exposure are two of the factors which have driven a growing uptake in certification services and insurer certified products in recent years. South East Asia and Australasia are growing markets for the update of FM Global services, in embracing better risk management. In recent times, Australia has seen large losses from natural disasters – floods, fire, storms and cyclones and there have been significant losses in New Zealand and other areas from earthquakes.

The certification branch of FM Global (FM Approvals) offers worldwide certification and testing services of industrial and commercial loss prevention products. Recognized and respected across the globe, FM Approvals certification assures customers that a product or service has been objectively tested and conforms to the highest national and international standards.

FM Global conducts testing in fire and explosion hazards, hazard detection and protection technology, natural disasters (flooding, wind damage etc), electrical hazards, and automatic sprinkler hydraulics. These tests are all property risk based, and can range from witnessing the difference in how products burn to how construction components perform in hurricane conditions.

FM 4880 Fire Performance Accreditation

The FM trademark represents an independent fire testing standard and certification process that encompasses the concerns of the broader stakeholder – insurers, building owners, occupants and the fire services. The test regime is very stringent and in order to achieve certification approval there has to be no flame spread or fire propagation to the extremities of the panel construction.

Most importantly, fires can behave very differently depending on the room size and ceiling height, and as a consequence of this, FM certifies fire performance to different heights. The Kingspan Insulated Panels KS1100 CS range have FM Certification for ‘unlimited height’, for FM global compliance and to protection of property investments in the event of fire.

The key objective of Building Regulation guidance is to ensure that personnel can leave the building safely in the event of a fire rather than a primary objective of preserving the building itself.

Property insurers however have an interest in property conservation, and they recognise the limitations of the small scale reaction to fire tests used to demonstrate simple Building Regulation life safety compliance, and have developed their own large scale tests. Of these tests the most widely recognised in Australia was developed by FM (Factory Mutual – now known as FM Global).

The test standard FMRC 4880 (1994) Approval provides requirements for Class 1 fire classification. There are various levels of performance with the key one being a test 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 fullscale room corner 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 without any height restriction, there has to be no flame spread or fire propagation to the extremities of the panel construction.

Set up of FM full scale fire test prior to commencement (Note the use of a large wooden crib as the fire source).

third party product accreditation (FM Global)

Kingspan PIR insulated panels have performed well in all these tests, 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 1 hour insulation and integrity is achievable with specific systems

FM 4881 certification for Natural hazards for External Walls

Exterior wall panels are exposed to greater risks, including greater fire risk, and also environmental impacts from storm damage, hail, floods and windborne debris. The exposure of internal walls is not often as onerous. In order for FM accreditation to be valid for external walls, testing to FM4881 – 'Approval Standard for Class 1 Exterior Wall Systems', must be completed. The test regime also includes testing of fire performance to FM 4880. Kingspan panels have been tested & certified to both these standards, and ongoing product development is evolving to deal with higher risk areas, including cyclonic regions for external wall applications.

Impact damage can lead to full building cladding failure in severe windstorms.

FM Panel System Approval

Kingspan KS1100 CS panel systems are available with FM Global FMRC 4880 Approved Unlimited Height and FM Global 4881 Approved Class 1 Exterior Wall System Certifications.

accessories

FM Approved Suspension Systems and Components

A number of suspension systems and component kits are available through Polyplas. Outlined in this brochure are examples of the kits available in the market that are specifically intended for the installation of Kingspan controlled environment panel systems to meet FM Approved standards. (Non FM Approved kits are also available).

Kits can be ordered directly from Polyplas

Polyplas Proprietary Limited
Tel +61 (03) 9720 0449
Fax +61 (03) 9720 0469
Email sales@polyplas.com.au
Web www.polyplas.com.au
Web www.grippleaustralia.com.au

POLYPLAS

GRIPPLE

Wall Kit

CODE: WSK A

Wall Suspension Kit , M12 steel plate system, Hot Dip Galvanised Items

Note: Length of allthread rod & panel thickness required when placing an order

Wall Kit

CODE: WSK B

Wall Suspension Kit , M12 mushroom head system, Hot Dip Galvanised Items

Note: Length of allthread rod & panel thickness required when placing an order

accessories

Roof Kit
CODE: RSKI Mi
Roof Suspension Kit , M12 Minor,
Hot Dip Galvanised Items

Note: Panel thickness required when placing order

No 4 Gripple Hang Fast Kit
CODE: HF04-2M
CODE: HF04-4M
CODE: HF04-6M
CODE: HF04-10M
(4.75mm Swagged Wire Rope, gripple & release Key)
Std Lengths 2m, 4m, 6m, 10m or
Made to Measure / P.O.A.

Roof Kit
CODE: RSKI Ma
Roof Suspension Kit , M12 Major,
Hot Dip Galvanised Items

Note: Panel thickness required when placing order

TORQ Tensioning Tool
CODE: Tool-3-6MM-LOCK-1BX
Gear drive delivers up to 300kg wire tension

case study
freezer

manassen
foods

Project	Manassen Foods Australia Pty Limited
Location	Eastern Creek, New South Wales
Product	KS1100 CS
Designer Builder	SBP Australia
Building use	Distribution Facility

case study
food processing

wilpak
meats

Project	Wilpak Meats
Location	Ipswich, Queensland
Product	KS1100 CS
Designer Builder	Multispan
Installer	Retracom
Building use	Distribution Facility

case study
cold / chill store

coles

Project	Coles Distribution Centre
Location	Laverton, Victoria
Product	KS1100 CS
Designer Builder	Qanstruct
Installer	Austral Australia
Building use	Cold storage logistics centre

case study
food processing

charlie's
cookies

Project	Charlie's Cookies
Location	East Bentleigh, Victoria
Product	KS1100 CS
Designer Builder	Brady IPS P/L
Building use	Bakery - Food Production

case study agricultural

regal mushrooms

Project	Regal Mushrooms Growing Shed
Location	Londonderry, New South Wales
Product	KS1100 CS
Designer Builder	Thermal Installations
Building use	Mushroom Farm

kingspan insulated panels product range

Controlled environment panel systems

Rib – KS1100 CS

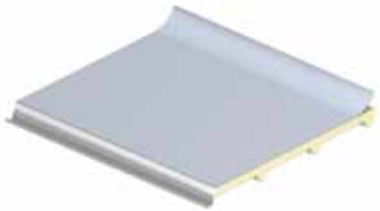
Flat – KS1100 CS

Roof panel systems

Trapezoidal – KS1000 RW
Roof Pitches 4° and above
(for lower pitches contact Kingspan technical)

Lo-pitch – KS1000 LP
Roof pitches 1.5° and above

Foilback – KS1000 FB
with reflective foil liner



Kingspan Topdek – KS1000 TD
Single-Ply TPO Membrane faced

All Kingspan panels are manufactured to order with varying core thicknesses depending on the spanning and thermal requirements of the project.

Kingspan roof and wall panels are available in a range of colours from the Kingspan Collection - barnett, josef, ellsworth and piet.

Colour Samples
Metal swatches for each range can be requested through Kingspan's Marketing Department to assist you in verifying colour and texture of the coating system before specification. The Kingspan Collection is produced from ColorGuard steel. COLORGUARD ® is a registered trademark of Onesteel Pty Ltd.

ColorGUARD Tougher In Any Colour onesteel

Wall panel systems – can be laid horizontally and vertically

Micro-Rib – KS1000 MR
Architectural Wall Panel

Euro-Box – KS1000 EB
Architectural Wall Panel

Mini-Micro – KS1000 MM
Architectural Wall Panel

Wave – KS1000 WV
Architectural Wall Panel

Plank – KS1000 PL
Architectural Wall Panel

Trapezoidal – KS1000 RW

Kingspan Evolution – KS600/900/1000 Evolution

Flat panel supplied as a system with a number of different ancillary options

support

As a manufacturer we go far beyond delivering a wide range of market leading products

The team is on hand to assist clients, specifiers and contractors.

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Fax +64 (03) 358 7539
Email info@kingspanpanels.co.nz
Web www.kingspanpanels.co.nz

for enquiries in South East Asia please contact the Australian office.

Area Sales Manager

Available to assist you in the appropriate selection and specification of our range of Products, the Area Sales Manager can provide you with a local and responsive service.

Customer Services

Offer advice on lead times and minimum order quantities. The team are responsible for issuing quotes, coordinating the manufacture of your panel requirements with the production team, scheduling delivery and keeping you updated with the progress of your order.

Kingspan Technical Services

Offer technical advice and support throughout the design and construction process. From the provision of project specific details through to the creation of project specific specifications, Kingspan Technical Services can help to ensure that your building performs and complies with the building regulations.

Field Service Support

Kingspan's Field Service team offers a free* total support package

- Contractor training on the installation of new and existing products
- On site training & support
- Pre-contract technical support and advice on specification compliance
- Site inspection service for the duration of the project contract period
- Pre-warranty Site inspection
- Advice on mechanical handling solutions

** AUS/NZ only*

Marketing Services

On hand to organise literature, samples and metal colour swatches.

Kingspan Thailand Strategic Partner and Authorized Distributor :

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