

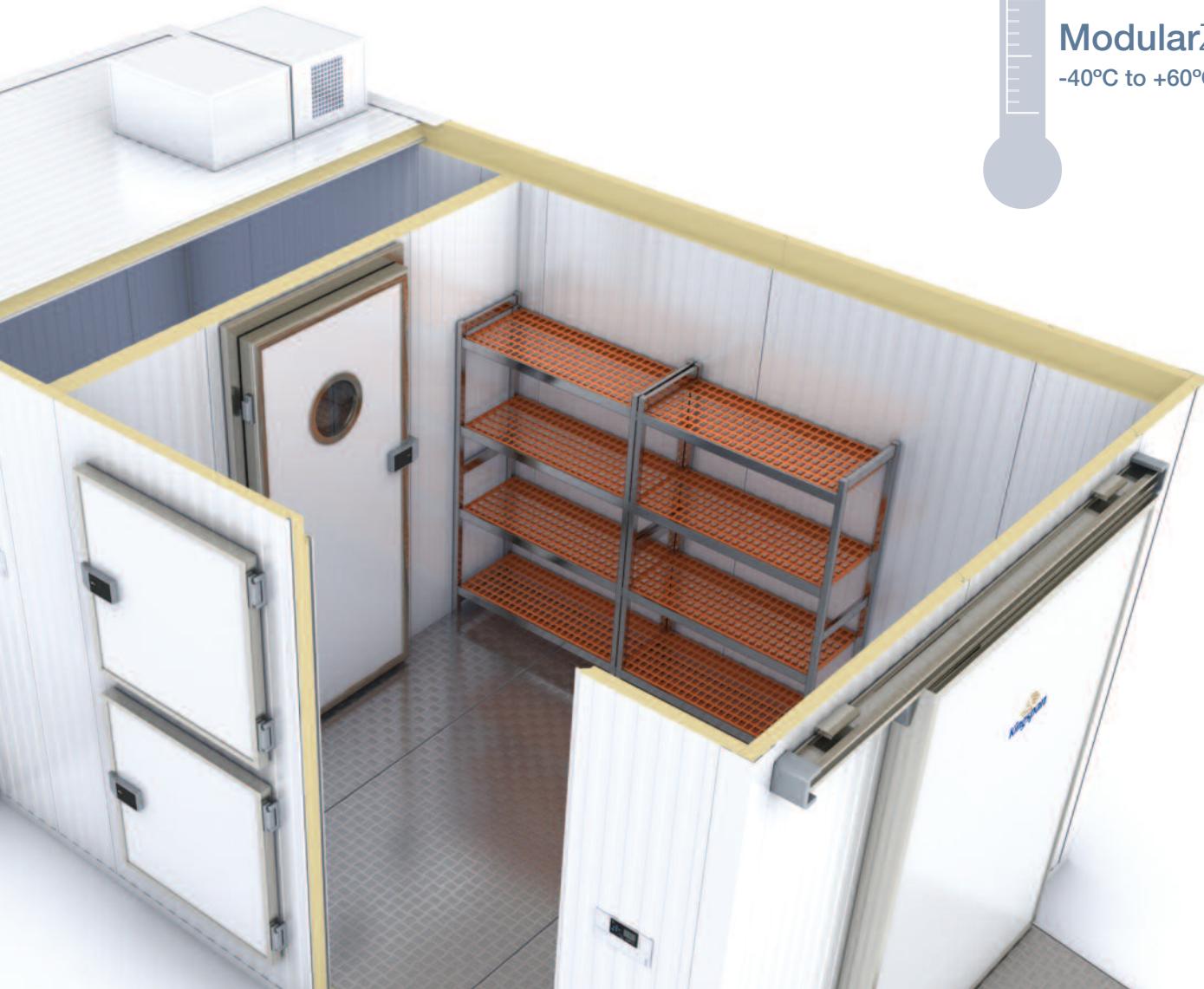
CI/SfB  
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November 2011

# ModularZone

High Performance Modular Cold Rooms  
and Freezer Rooms

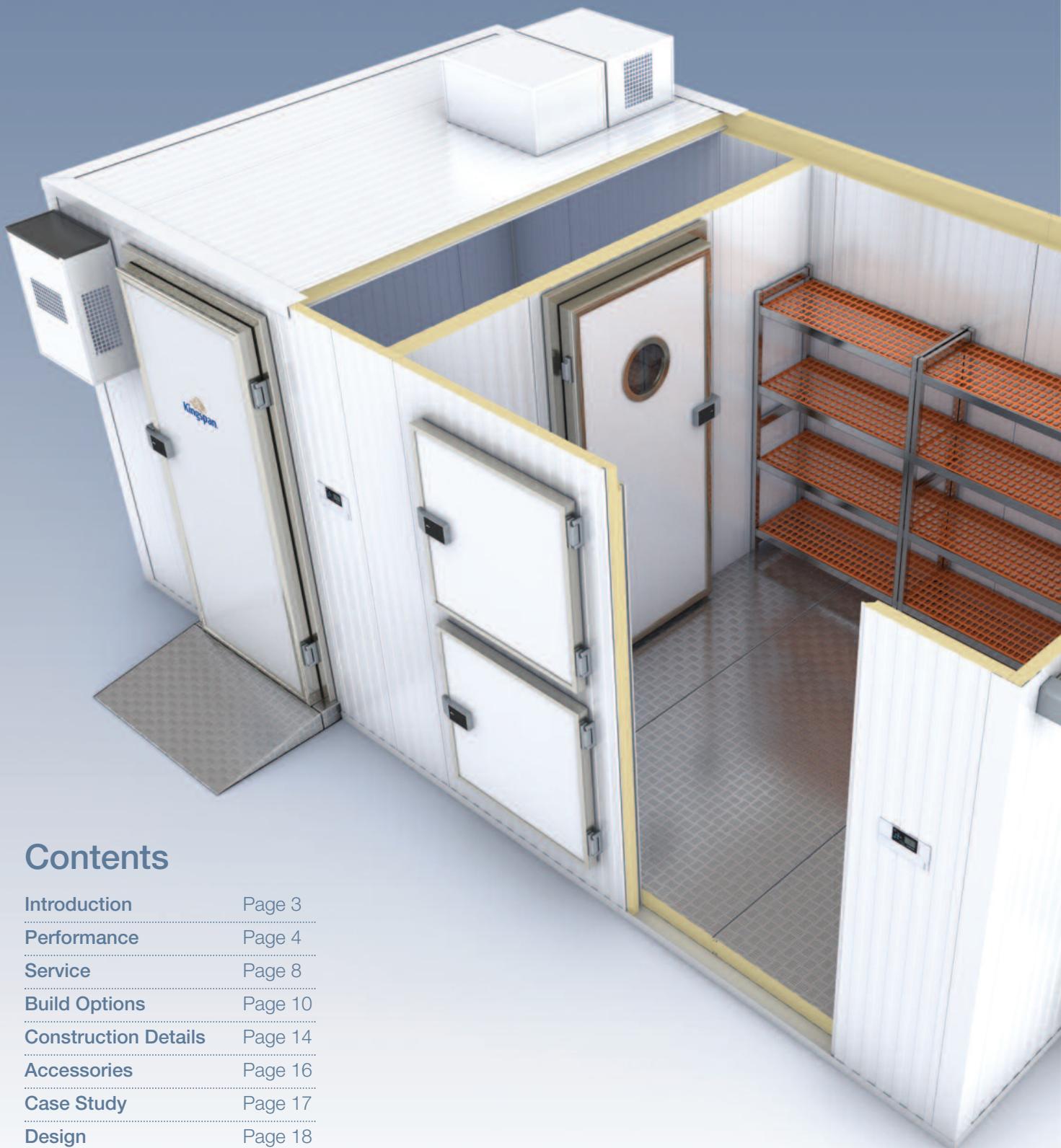


**ModularZone**  
-40°C to +60°C



# ModularZone

Coldrooms from Kingspan



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# Introduction

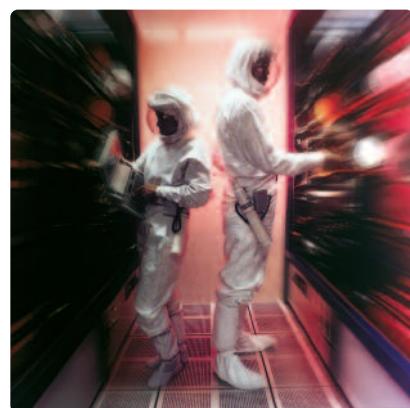
Kingspan Insulated Panels are the largest division of the Kingspan Group, and within our core area of business, we have established an enviable position as a global leader in the design and manufacture of high quality insulated roof, wall and façade systems for the construction industry. Through-wall solutions, structural products, controlled environments and fall protection systems are also part of our extensive product portfolio.



- Kingspan Modular Coldrooms are designed to provide flexible coldroom solutions for use in many applications including, foodservice, bakeries, IT, medical and research facilities.

These modular units can be custom-built to your requirements or bought “off the shelf” in a range of standard sizes. Delivered as flat pack walk in cold rooms, these units combine very high levels of guaranteed performance with ease of assembly and a fully supported fast track service.

Kingspan modular coldrooms are manufactured using a PIR core insulated panel which provides optimum thermal efficiency and high levels of fire performance.



# Performance

Kingspan Modular Coldrooms are manufactured with a PIR insulation core which offers unrivalled insulation performance for a number of reasons.



## Fire Performance

Underwriters and landlords are demanding fire rated coldrooms to minimise risk and insurance premiums. Kingspan Modular coldrooms are constructed using insulated panels with FIREsafe LPCB approved cores. PIR is amongst the most efficient insulating materials available. Its low-density rigid core exhibits superior thermal stability and lower combustibility when compared to other insulating materials. There are a number of tests which identify the performance of products when tested in relation to fire.

Kingspan modular coldroom insulated panels provide Fire Resistance of up to 1 hour. When exposed to flame PIR forms a strong carbonaceous char that protects the core foam from ignition. PIR is recognised industry wide as the fire safe alternative to foam cores including polyurethane and polystyrene.



PIR insulation  
after 30 minutes  
at over 1000°C

## LPS 1208 ✓

LPS 1208 defines the fire resistance performance for elements of construction used to provide compartmentation, which for insurance purposes includes the protected zone, 1000mm either side of the compartment wall or roof. This fire resistance requirement is vital for preventing fire spread via combustible products contained within the roof construction across compartment wall divisions.

## FM Approval – FM 4880 Class 1 ✓

FM 4880 defines Class 1 Fire Rating of Insulated Wall or Wall and Roof / Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems. Panels tested to this standard must pass a large scale fire testing in which numerous panels are installed to mimic field applications and then subjected to a corner fire to quantify the extent of fire propagation. These large scale tests reach extremely high temperatures, more closely related to everyday installation and function.



## BS476-7 ✓

This test refers to fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products.

This test measures the rate of spread of a flame front across a material surface, but does not consider emission of toxic smoke and gas. Class 1 is the highest classification, with the slowest rate of spread, Class 4 is the highest.

The table below gives an overview of the fire performance of different polymeric coldstore materials available.

	LPC 1208	FM Approval	BS 476-7
PIR	✓	✓	✓ Class 1
PUR	X	X	✓
Expanded Polystyrene	X	X	✓

### Project

Malmaison Hotel, Manchester

Application  
Meat Curing Room

Client  
Vision Commercial Kitchens

Contractor  
Synecore

Paul from Synecore explained:

*"We were asked by client Vision Commercial Kitchens to deliver a visually stunning meat curing room for their very important client Malmaison Hotel in Manchester. Following long discussions and meeting with their interior designer and their kitchen team, we agreed on the zinc clad external and tiled internally finish. We use Kingspan PIR panels on all of our projects, however they were very useful here as the shape of the room needed to be formed on site and naturally the glazing had to fitted in the build process. The room runs at 4°C and is curing the meat perfectly for the chef who is thoroughly delighted with the end product. The customers who attend the restaurant are delighted to see the meat prior to the cooking process"*



# Performance

## Operating Temperatures

The table below shows the operating temperature of insulating materials available in the market for controlled environments.

Temperature range	
PIR	-40°C to +60°C
PUR	-50°C to 50°C
Mineral Fibre	+0°C to 230°C
Expanded Polystyrene	-25°C to 75°C



To determine the minimum panel thickness required for a given temperature condition, the following formula is used:  
 $D = \frac{Q}{\lambda \times \Delta t}$

- D = thickness of insulation
- $\lambda$  = thermal conductivity of insulation (m)
- $\Delta t$  = temperature difference between internal and external face (°C)
- Q = heat flow, set at 10 (W/m<sup>2</sup>)

### For example:

A freezer unit within a building with an internal operating temperature of -30°C and external ambient temperature of 20°C, would require the insulated panel thicknesses below:

Thickness Required	
PIR	100mm
PUR	100mm
Expanded Polystyrene	185mm
Mineral Fibre	200mm

## Heat Transmission

Thermal Conductivity ( $\lambda$ ) 0.0195 W/mK

Panel Thickness (mm)	50	60	80	100	125	150	175	200	220
Temp. Difference (°C)	0.39	0.31	0.25	0.20	0.16	0.13	0.11	0.10	0.095
10	3.90	3.25	2.44	1.95	1.56	1.30	1.11	0.09	0.89
15	5.85	4.88	3.66	2.93	2.34	1.95	1.67	1.46	1.33
20	7.80	6.50	4.88	3.90	3.12	2.60	2.23	1.95	1.77
25	9.75	8.13	6.09	4.88	3.90	3.25	2.79	2.44	2.22
30	11.70	9.75	7.31	5.85	4.68	3.90	3.34	2.93	2.66
35	13.65	11.38	8.53	6.83	5.46	4.55	3.90	3.41	3.10
40	15.60	13.00	9.75	7.80	6.24	5.0	4.46	3.90	3.55
45	17.55	14.63	10.97	8.78	7.02	5.85	5.01	4.39	3.99
50	19.50	16.25	12.19	9.75	7.80	6.50	5.57	4.88	4.43
55	21.45	17.88	13.41	10.73	8.58	7.15	6.13	5.36	4.88
60	23.40	19.50	14.63	11.70	9.36	7.80	6.69	5.85	5.32
65	25.35	21.13	15.84	12.68	10.14	8.45	7.24	6.34	5.76
70	27.30	22.75	17.06	13.65	10.92	9.10	7.80	6.83	6.20
75	29.25	24.38	18.28	14.63	11.70	9.75	8.36	7.31	6.65
80	31.20	26.00	19.50	15.60	12.48	10.40	8.91	7.80	7.09

The heat gain by conduction should be limited to 10W/m<sup>2</sup>. (See Code of Practice for the Design of Coldstore Envelopes).  
 For enhanced energy performance, the heat gain by conduction should be limited to 8 W/m<sup>2</sup>.

## Sustainability



### Sustainability



#### Low GWP

**ECOSAFE** environmentally sustainable  
PIR insulation core with zero ozone  
depletion potential



#### Cradle to Grave

Anticipated to achieve an A+/A  
rating according to the BRE Green Guide  
to Specification



#### End of Life

Suitable for processing through  
conventional shredder plants once end  
of useful life is reached

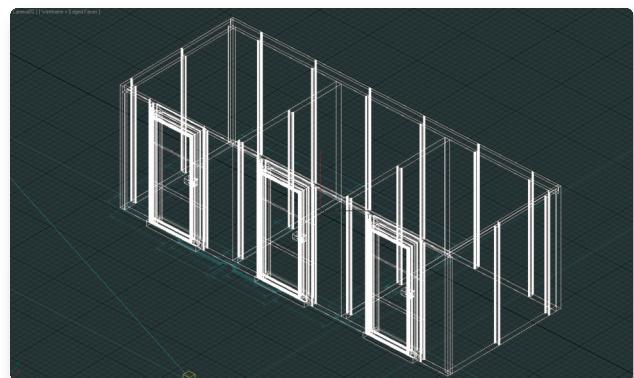


# Service

Kingspan offers a one stop shop for all your modular box requirements. We can supply modular coldrooms for many applications, complete with a range of accessories and equipment including temperature controls and chiller units.

## Design and Planning

At Kingspan we understand that every project is different and to suit your individual requirements we offer a full design service using state of the art software. We also supply a range of "off the shelf" freezer, chiller and dual compartment coldrooms, supplied with complete installation instructions. See pages 16-17 for standard sizes available.



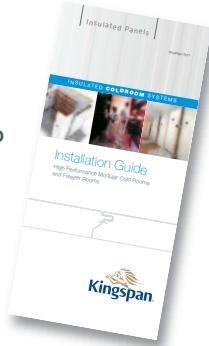
## Quality

Kingspan Modular Coldrooms are manufactured from the highest quality materials, using state of the art production equipment to rigorous quality control standards, approved to BS EN ISO 9001: 2008 (Quality management systems).

Requirements) and Kingspan's manufacturing sites are BS EN 14001 (Environmentally) BS OHSAS 18001 (Health and Safety) accredited.

## Installation Guidance

Kingspan's Modular Coldrooms are designed with simplicity in mind. The panels are cut using innovative technology which allows the panels to slot together quickly and easily. Each unit is despatched from our warehouse, flat packed and with an installation guide on how to erect.



State of the art technology ensures **precision** manufacturing of panel sizes and joints ensuring maximum air tightness.

## Guarantee

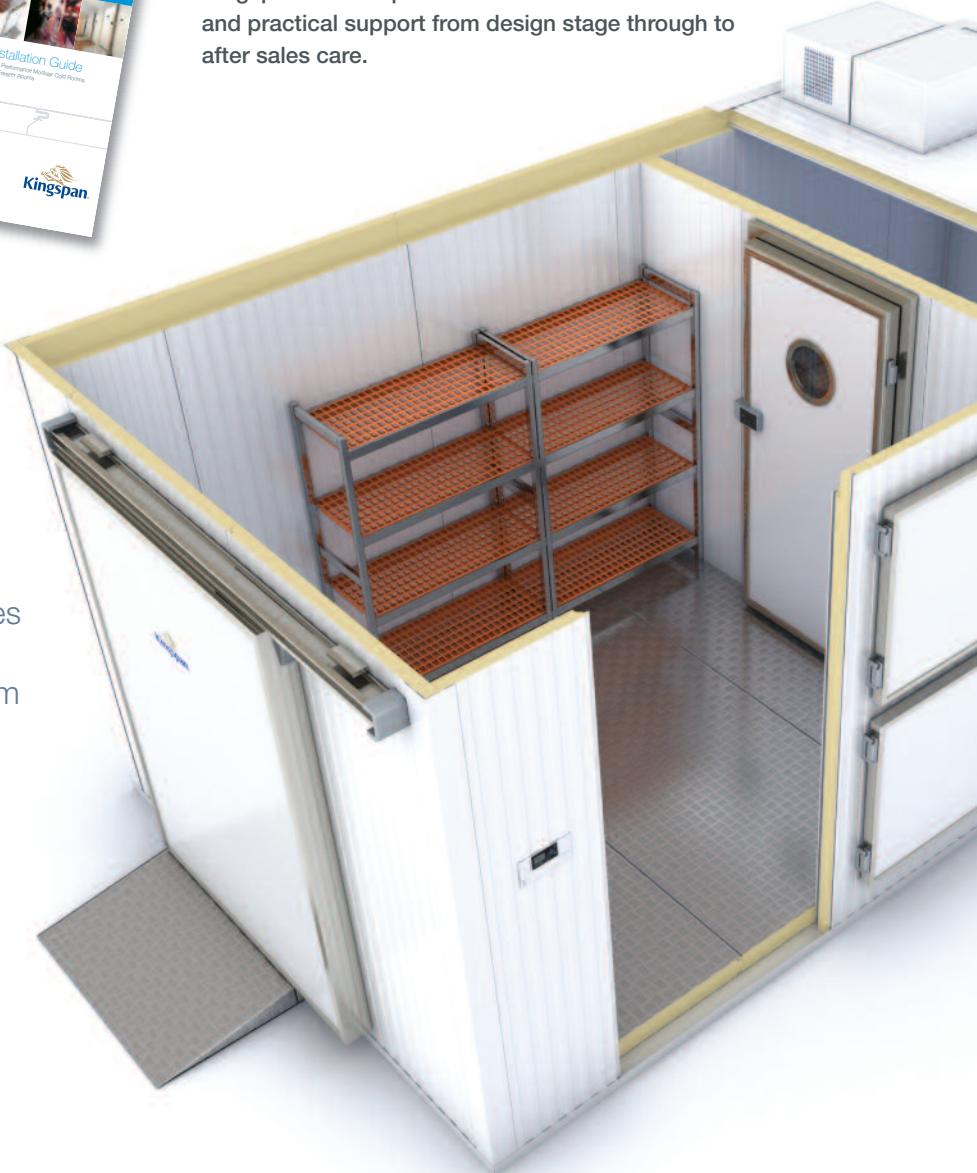
The panels used to form Kingspan's Modular Coldrooms are available with a 25 year thermal and structural performance guarantee.



A Kingspan Modular Coldroom Complete System guarantee is also available, please contact Kingspan **envirocare®** Technical services for details.

## Customer Service

Kingspan offers a personalised service with advice and practical support from design stage through to after sales care.



# Build Options

Optimum performance is a basic yet fundamental priority in controlled environments, since cold energy can be up to ten times more expensive than heat energy. To reduce energy costs, it is necessary to use the most energy efficient insulation possible. PIR (Polyisocyanurate) insulation offers the best thermal performance of coldstore insulating materials on the market.

The insulated panels used in Kingspan's Modular Coldrooms have an **ECOsafe** environmentally sustainable PIR insulation core which has a low Global Warming Potential (GWP), is non-deleterious and highly resistant to moisture ingress, chemicals, solvents, mould and bacterial growth.

## Systems Available

Kingspan Modular Coldrooms are available in two formats; **continuous** and **camlock**.

### Continuous

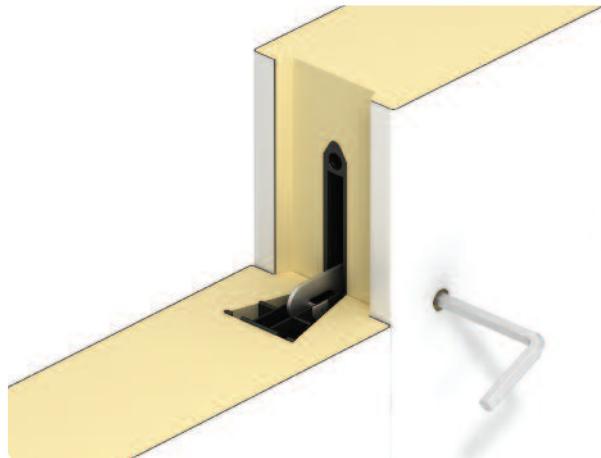
The insulated panels are supplied with rebated corners which allow them to slot together smoothly. There are no visible camlock holes or visible rivets once the unit is put together.



The continuous system panels are available in a range of thicknesses from 80mm up to and including 200mm and in widths from 250mm up to and including 1200mm.

### Camlock

The insulated panels for the floors, ceiling and walls are connected using camlocks with plastic housing and corrosion protected clamping hooks, formed into the panels when they are manufactured. The camlocks are easy to operate from the inside so the unit doesn't have to be accessible from the outside to erect. This system does not require cutting or drilling; it is easy to assemble and disassemble.

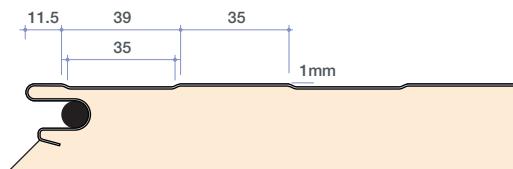


Insulated panels for the camlock system are available in 80 and 100mm thicknesses and in widths from 140mm up to and including 1200mm.

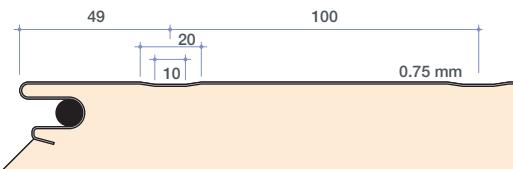
## Profile Options

Kingspan modular units are available in a range of internal and external profiles:

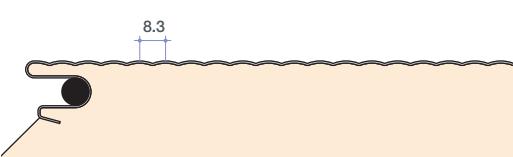
KS1100 CS Equi-Bead



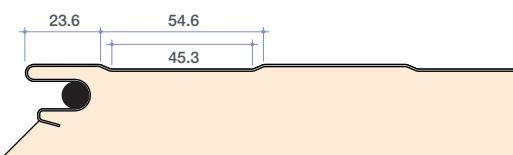
KS1100 CS Mini-Bead



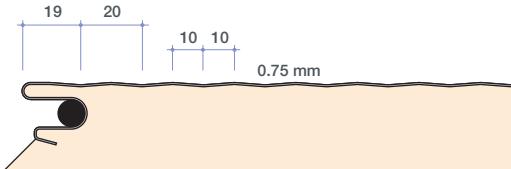
KS1100 CS Mini Micro-Rib



KS1100 CS Euro-Box



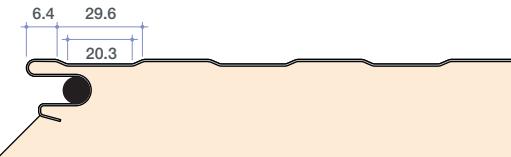
KS1100 CS Micro-Rib



KS1100 CS Flat (plain surface)



KS1100 CS Mini-Box

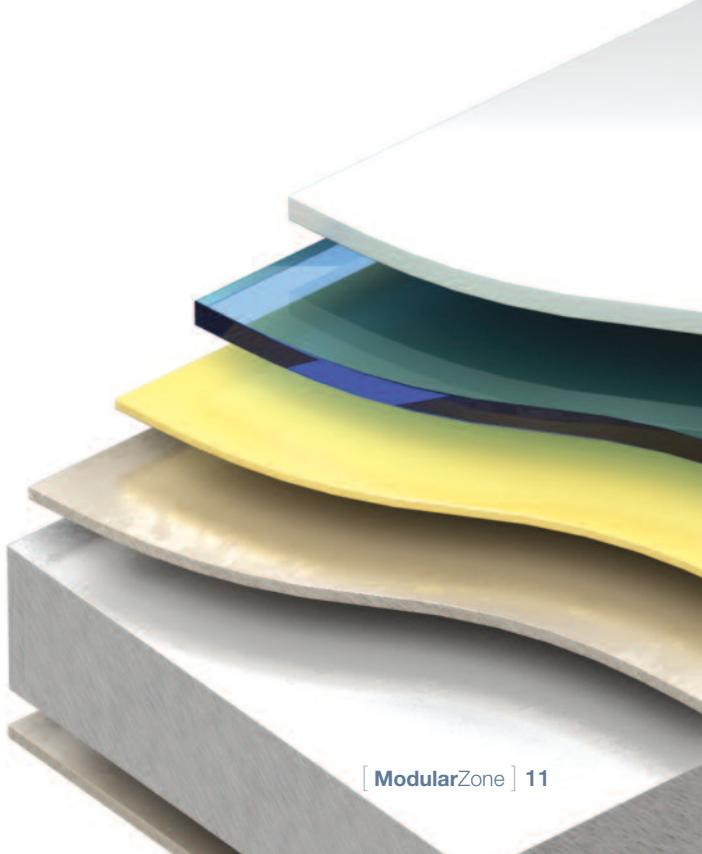
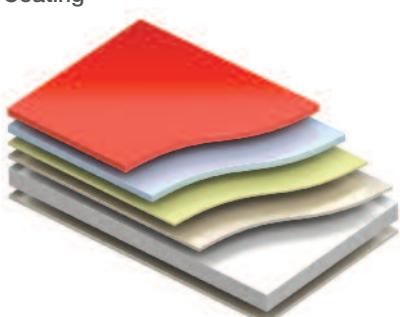


## Coatings

The external sheet of the insulated panels consists of hot galvanised zinc / aluminium coated metal, with a high performance Kingspan coating of either Kingspan XL Forte™ or Spectrum®. This guarantees smooth and resistant surfaces with sealed edges.

A stainless steel finish is also available; please contact Kingspan envirocare® Technical services for information.

A range of internal Kingspan Cleansafe coatings are available for specific controlled environment conditions. For further information please see the Kingspan Coating Selector for controlled environments, available from the Kingspan Marketing Department on 01352 717251.



# Build Options

## Doors

A range of hinged and sliding doors, with or without vision panels are available.

Note: All standard hinged doors to be fitted into Kingspan 1100mm wide cold store panel.



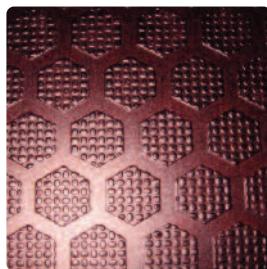
Description	Model	Size (mm)	Blade Details	Frame	Accessories	Track
Kingspan Chill Door	Slam Faced	700, 800, 900 Wide x 1900mm High	60mm Leaf White foodsafe Laminate to both faces Fermod 921 Handle	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 80mm panel thickness	N/A	N/A
Kingspan Chill Door (Floor)	Slam Faced	700, 800, 900 Wide x 1900mm High	60mm Leaf White foodsafe Laminate to both faces Fermod 921 Handle	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 80mm panel thickness	Frame to be fitted to fabricated step to suit floor thickness	N/A
Kingspan Freezer Door	Semi – Rebated	700, 800, 900 Wide x 1900mm High	120mm Leaf White foodsafe Laminate to both faces Fermod 921 Handle	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 100mm panel thickness	Complete with low voltage frame & threshold heater	N/A
Kingspan Freezer Door (Floor)	Semi – Rebated	700, 800, 900 Wide x 1900mm High	120mm Leaf White foodsafe Laminate to both faces Fermod 921 Handle	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 100mm panel thickness	Complete with low voltage frame & threshold heater frame to be fitted to fabricated step to suit floor thickness	N/A
Kingspan Sliding Chill Door	Sliding	800 Wide x 2000mm High	80mm Leaf White foodsafe Laminate to both faces	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 80mm panel thickness	N/A	Fermod 2120/2150 Series with 2000 Series Handle
Kingspan Sliding Freezer Door	Sliding	800 Wide x 2000mm High	100mm Leaf White foodsafe Laminate to both faces	Anodised Aluminium, all fixings hidden Integral nylon thermal break To suit 100mm panel thickness	Complete with low voltage frame & threshold heater frame to be fitted to fabricated step to suit floor thickness vision panels	Fermod 2120/2150 Series with 2000 Series Handle
Kingspan Personnel Doors	Personnel	810 x 2040mm 810 x 2040mm	N/A	N/A	Vision panels	N/A
Kingspan Double Doors	Double Doors	1640 x 2040mm 1780x 2040mm 2000 x 2040mm	N/A	N/A	Vision panels	N/A

## Floors

A range of floor coverings are available with Kingspan Modular Coldrooms.

### Hexa-Floor (9mm)

A strong birch plywood overlaid with a non-slip finish, which has a pattern imprinted into the surface. It is available in grey, dark brown, black or green and is ideal for coldstore flooring as it is extremely robust and hardwearing.



### Rigidised Galvanised Overlay (2mm, Supermarket Spec 6WL)

Galvanised steel which is overlaid for heavy duty trolley application.

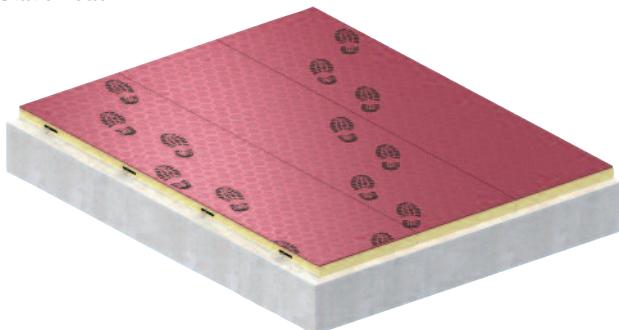
### Aluminium Five Bar Overlay (2mm)

Galvanised steel with a five bar pattern, for heavy duty trolley application.

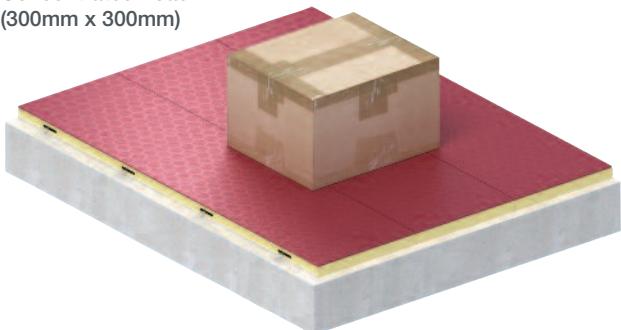
## Floors Load Tables

Floor Types	Static Load (Distributed)	Concentrated Load (300mm x 300mm)	Concentrated Load (25mm x 25mm)	Rolling Load	Recommended Application
9mm Hexa-Floor	1500 kg/m <sup>2</sup>	900 kg/m <sup>2</sup>	400 kg/m <sup>2</sup>	250 kg/m <sup>2</sup>	Pedestrian Light duty trolley Shelving Support
18mm Marine Ply	1500 kg/m <sup>2</sup>	900 kg/m <sup>2</sup>	400 kg/m <sup>2</sup>	400 kg/m <sup>2</sup>	Heavy duty trolley
Floor Overlay Sheets (6WL & Five Bar)	1500 kg/m <sup>2</sup>	900 kg/m <sup>2</sup>	400 kg/m <sup>2</sup>	400 kg/m <sup>2</sup>	Heavy duty trolley

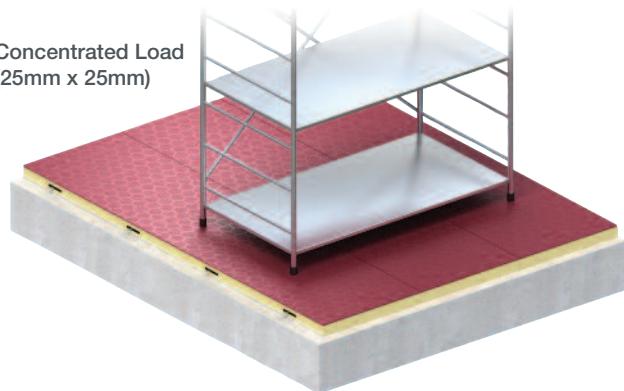
Static Load



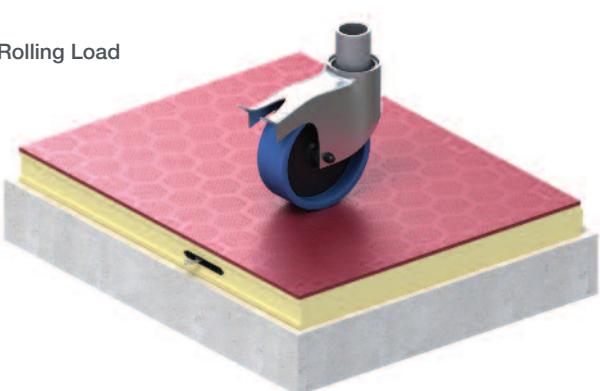
Concentrated Load  
(300mm x 300mm)



Concentrated Load  
(25mm x 25mm)



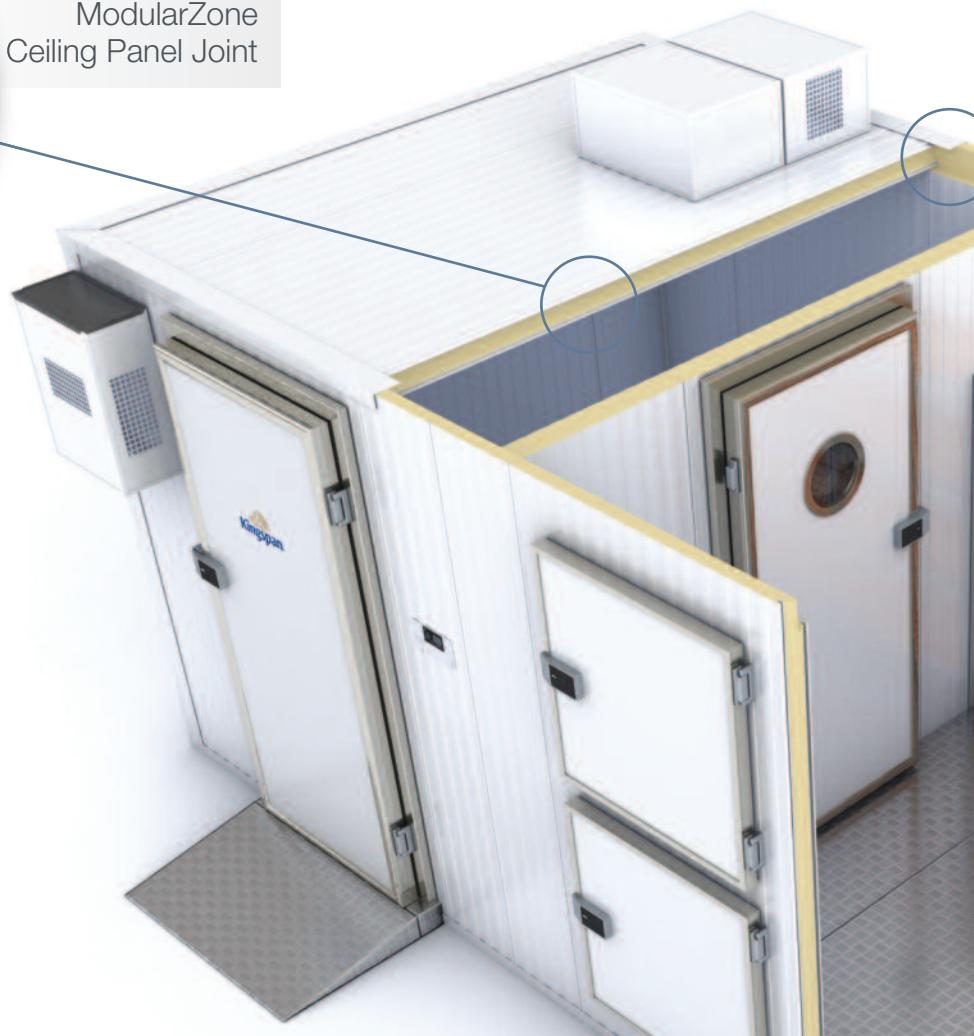
Rolling Load



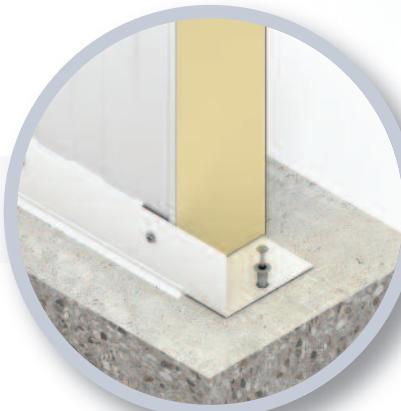
# Construction Details

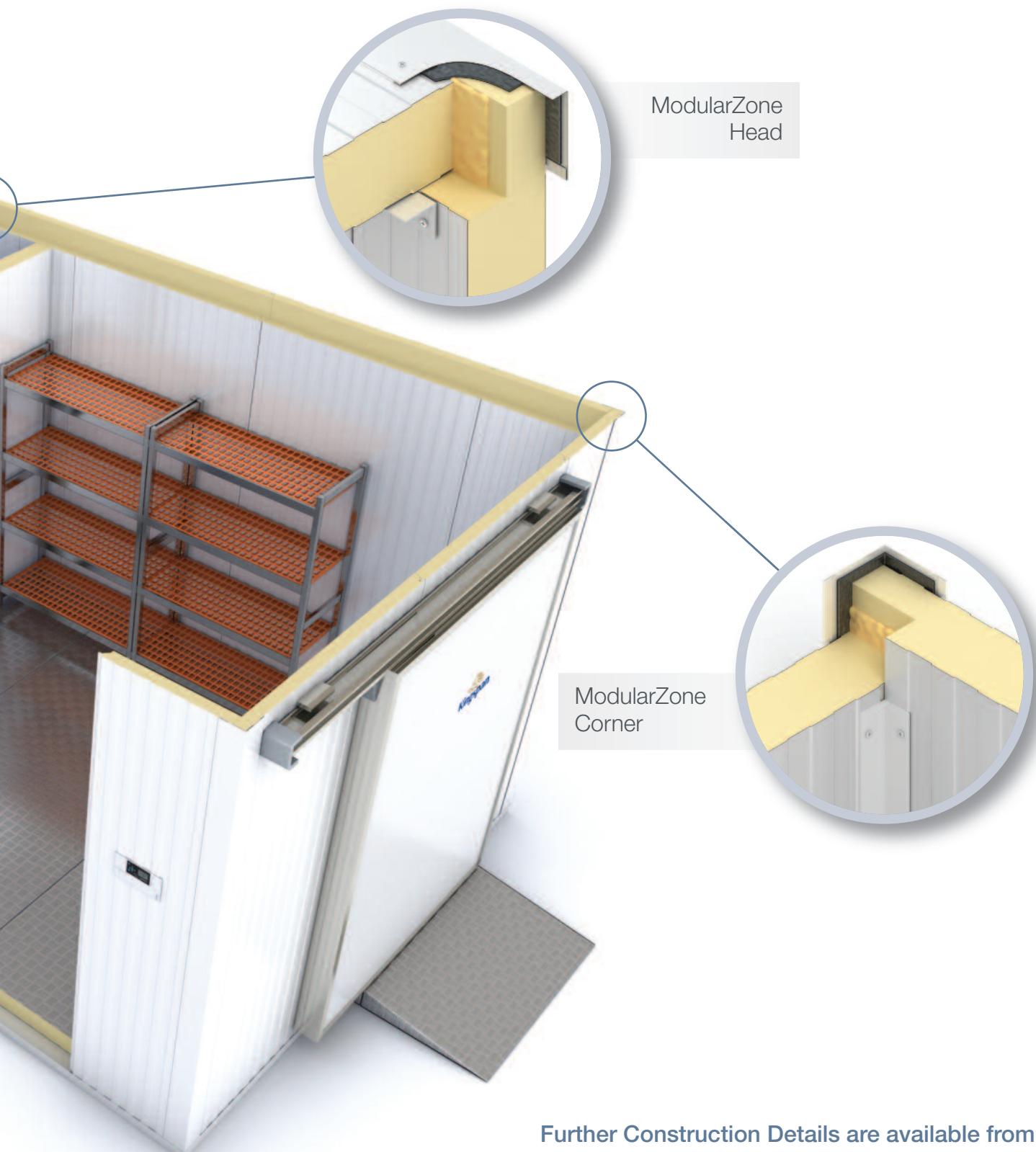


ModularZone  
Ceiling Panel Joint



ModularZone  
Base





Further Construction Details are available from  
Kingspan envirocare® Technical Services.

# Accessories

## Internal Covings

Kingspan Modular Coldrooms can be supplied with flexi-edge covings for all vertical and horizontal joints.

These consist of screw in aluminium retainers, clip-on coving corner retainers, corner cover pieces and coving end pieces.



## Shelving Systems

Kingspan can provide easy to assemble, no-screw shelving suitable for all applications. The shelving systems are easy to clean as the shelves can be removed.



## LED Lighting

High quality lighting will improve quality control, safety and production levels. The lighting fixtures available with Kingspan Modular Coldrooms are ideal for commercial cold rooms, food processing centers, hotels, motels, restaurants, high moisture areas and anywhere that require a healthy environment. The totally sealed housing of the cold room lighting fixture maintains ceiling integrity and protects against infiltration of particles and airborne bacteria.

## Temperature Control & Datalogging

The task of controlling and monitoring temperature is a duty made simple with Kingspan's control and datalogging systems.

Engineered by renowned refrigeration control experts Thermomax, these state-of-the-art systems use the latest technology to control, monitor, store and transmit the precise activity within the temperature zones of your facility.



- Remote access via the internet to change and monitor cold room parameters
- Remote alarm functionality via email
- Integrated data logging functionality giving 3 channels of monitoring
- Backward compatible with existing thermomax sensors
- USB back up and LAN data down load
- CE certified and EN12830 compliant
- Fully compatible panel mount and surface mount enclosure
- Firmware upgradability for future revisions

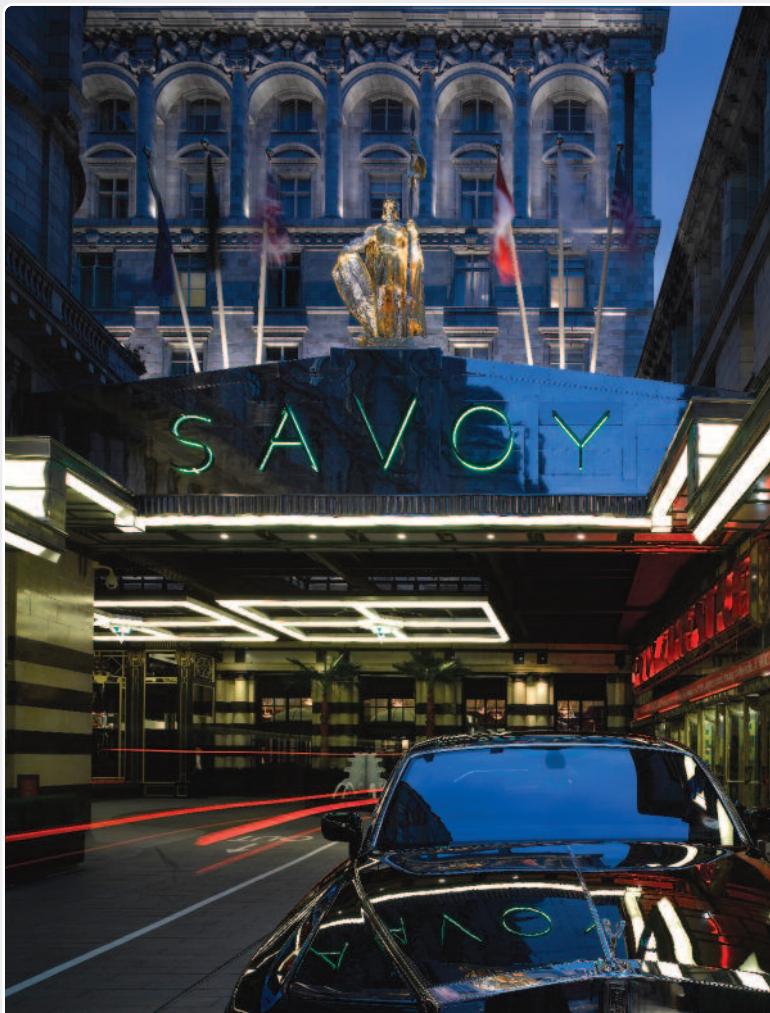
For full details visit  
[www.thermomaxrf.com](http://www.thermomaxrf.com)

For the full range of accessories, please see the Kingspan Ancillary Selector for temperature controlled environments.

# Case Study

## Project

Savoy Hotel, London



## Location

London

## Application

Food Storage and Preparation

## Client

The Savoy

## Contractor

Catering Cooling Ltd

## Volume

19 Modular Units (approx. 80m<sup>2</sup> each)

Nineteen flat-pack, site-assembled, walk-in cold stores were installed at The Savoy Hotel in London. The Modular Boxes comprise high performance panels, which have a PIR Firesafe core and provide optimum levels of thermal efficiency with the crucially important fire protection required.

David Blinkhorn, Managing Director of installer Catering Cooling explained:

*"I inform my clients about the importance of having PIR as opposed to PUR insulation because of PIR's superior fire properties. We specified The Modular Box cold rooms on the strength of their fire performance rating, as we felt this was important for the client. We now specify PIR to all our clients and not just in the UK. There is also increasing pressure from our clients to supply a superior product and I would like to think we have done so in using Kingspan."*

The fire rating is important because cool storage units create huge amounts of heat and most are located in commercial Kitchens where the risk of fire is huge. But the heat produced need not go to waste. At The Savoy, a heat reclaim system was installed with the Modular Boxes, so that their cooling systems also provide recycled heat to the hotel's hot water supply to the bedrooms.

# Design

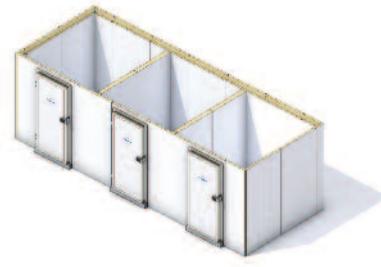


## Kingspan Precision Modular Coldrooms

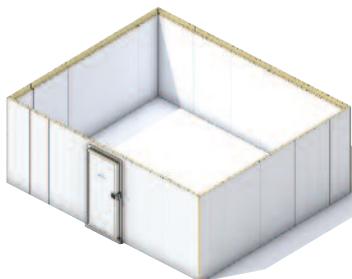
Kingspan Precision Modular Coldrooms are “off the shelf” freezer, chiller and dual compartment coldrooms, ranging in sizes from 1.70m x 1.10m up to 5.0m x 5.0m.

These simple yet high quality units are delivered flat packed with assembly instructions along with a range of tools and accessories. To view the items included please visit

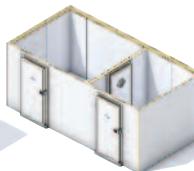
[www.kingspanc.com](http://www.kingspanc.com)



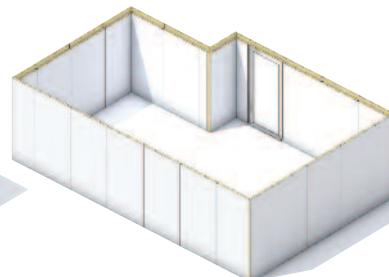
Multi-chamber



Single Chamber



Dual Compartment



L Shape



Angled

## Coldroom Selector

Kingspan Precision Modular Boxes for chiller rooms and freezer rooms, temperature range -21°C to 1°C

	Width (m)	Length (m)	Height (m)	Room Vol. (m³)
Room 1	1.70	1.10	2.30	4.3
Room 2	1.70	1.45	2.30	5.7
Room 3	1.70	1.80	2.30	7.0
Room 4	2.00	1.10	2.30	5.1
Room 5	2.00	1.45	2.30	6.7
Room 6	2.00	1.80	2.30	8.3
Room 7	2.00	2.00	2.30	9.2
Room 8	2.20	1.10	2.30	5.6
Room 9	2.20	1.45	2.30	7.3
Room 10	2.20	1.80	2.30	9.1
Room 11	2.20	2.20	2.30	11.1
Room 12	2.60	1.10	2.30	6.6
Room 13	2.60	1.45	2.30	8.7
Room 14	2.60	1.80	2.30	10.8
Room 15	2.90	1.10	2.30	7.3
Room 16	2.90	1.45	2.30	9.7
Room 17	2.90	1.80	2.30	12.0
Room 18	3.30	1.10	2.30	8.3
Room 19	3.30	1.45	2.30	11.0
Room 20	3.30	1.80	2.30	13.7

## Kingspan Precision Multi Compartment Coldrooms

Total Rooms	Total Room Sizes			
	Width (m)	Length (m)	Height (m)	Room Vol. (m³)
Room 21	2.00	2.00	2.30	4.6
Room 22	2.50	2.50	2.30	7.2
Room 23	3.00	3.00	2.30	10.4
Room 24	4.00	4.00	2.30	18.4
Room 25	5.00	5.00	2.30	28.8

Prices and quotes can be obtained from the Kingspan Quotations Department on 01352 716400.

The following items are available with all of the Precision Modular Boxes:



Temperature Control

Evaporators and Condenser Units



Wall Mounted Refrigeration Units

[www.kingspan.com](http://www.kingspan.com)



UK: Telephone: +44 (0) 1352 716100 Fax: +44 (0) 1352 710161 Email: [info@kingspanpanels.com](mailto:info@kingspanpanels.com)  
Ireland: Telephone: +353 (0) 42 96 98500 Fax: +353 (0) 42 96 98572 Email: [sales.ire@kingspanpanels.com](mailto:sales.ire@kingspanpanels.com)

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