

Product Data Sheet - KS1000 DR

Applications

The Kingspan - Panel KS1000 DR is a secret fixed roof panel, which can be used for all building applications where the finished roof pitch is 1.5° or more, minimum self curve 150m radius. Finished roof pitch describes the actual pitch of the roof after allowing for the deflection of the supporting steel and erection tolerances. All KS1000 DR panels are supplied with a **FIREsafe** Polyisocyanurate (PIR) insulation system with zero Ozone Depletion Potential (Zero ODP). This panel forms the basis for a variety of construction specific applications. These are summarised as follows:

Standard Industrial - LPC approved - HCFC Free

Insurer approval by compliance with Loss Prevention Council Accreditation is in most respects the standard requirement for all new constructions.

The standard panel with **FIREsafe** insulation and the standard construction details shown in this section ensures compliance with these requirements.

All KS1000 DR panels comply with current legislation are CFC free, HCFC free and have zero Ozone Depletion Potential.

Internal environment is an important factor in determining the way in which the building envelope is constructed. The details noted in this section using the standard panel are suitable for building with internal humidity class 1 to 4 as described in BS EN ISO 13788:2002.

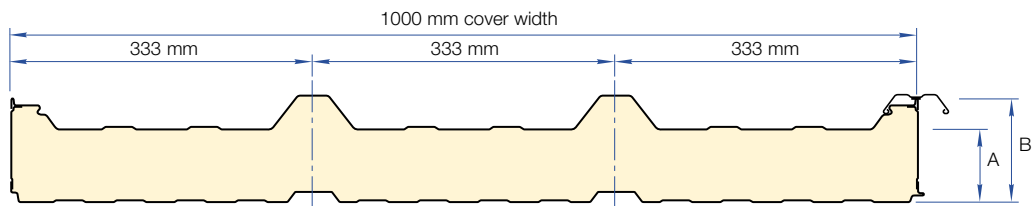
In terms of Part L2A & L2B and Section 6 Scotland requirements of the building regulations the standard construction details shown in this section are designed to be 'Robust' and help the building designer in ensuring compliance with the requirements.

Model and NBS type specifications are available for all construction applications.

High humidity. Low temperature, Food Safe environments

Where internal environments are considered aggressive or extreme in terms of humidity and durability, enhanced panel specifications and construction details may be required. Protective coatings to the internal liner are available that are more suitable for aggressive conditions or longer durability. In addition construction details at the panel joints, ends and junctions will require consideration along with the choice of fastener material. Kingspan envirocare Technical Services Department can provide NBS specifications for specific construction applications.

Dimensions



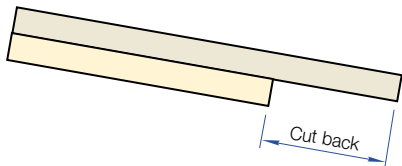
Weights

A - core thickness (mm)	40	50	60	80	100
B - overall dimension (mm)	75	85	95	115	135
Weight kg/m ²	10.02	10.46	10.9	11.8	12.7

80mm & 100mm thicknesses comply with the minimum requirements of Building Regulations Part L England & Wales and Section 6 Scotland.

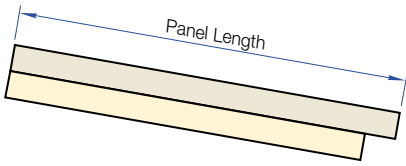
Panel End Cut Back

All panels are normally produced with an eaves cut back of 100mm, cut back of 65mm can also be manufactured. If flush ended panels (no cut back) are required they can be manufactured. Cut back for panel end lapping is 100mm. Lap plates are required to be specified on underlapping panels (see table page 4:9).



Available Lengths

Standard lengths 1.8 to 18 metres. 18 to 29 metres can be supplied but are subject to a special transport arrangements and surcharge. Panels less than 1.8m long can be supplied but are subject to extra charge. Snap caps are included in panel price, extras can be supplied at extra cost.



Product Tolerances

Cut to Length	-0.05%	-0.1%
Liner Sheet Length	-0.1%	-0.1%
Cover Width	0mm	-3mm
Thickness	+2mm	-2mm
End Square	+3mm	-3mm

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Materials - Steel

Substrate

- Kingspan XL Forté and Spectrum uses hot-dip metallic coated steel substrate comprising a 95% zinc / 5% aluminium alloy coating on a S220GD grade steel with a coating weight of ZA255 to BS EN 10326:2004.

- Standard external skin, nominal thickness 0.5mm. Standard internal skin, nominal thickness 0.4mm.

Coatings – External Weather Skin Options

- *Kingspan XL Forté*. The weather side of the steel substrate comprises 200 µm high performance organic coating system with leather grain appearance. Specifiers and building owners have the protection of the Kingspan Total Guarantee which includes cut edge protection for the full guarantee period of up to 30 years. Kingspan XL Forté is the preferred specification for use on both roof and wall applications.
- *Kingspan Spectrum™* polyurethane coated alloy substrate offers a semi-gloss finish with a slight granular effect. Specifiers and building owners have the protection of the Kingspan Total Guarantee which includes cut edge protection for the full guarantee period of up to 30 years.

Coatings – Internal Skin Options

- Bright White Polyester: 15 micron thick coating developed for use for the internal lining of insulated panels. Standard colour is “bright white” with an easily cleaned surface.
- AquaSafe: 200 micron thick coating used in areas where there is high internal humidity, or a corrosive environment.
- Cleansafe: 55 micron thick chemically inert polymer film bonded to steel suitable for cladding the interior of cold stores, food processing buildings and other hygiene applications.

Materials - Aluminium

Substrate

- Aluminium substrate, Grades 3004 series.
- Standard external sheet thickness 0.7mm, standard internal sheet thickness 0.5mm.
- Aluminium faced panels do not carry LPS 1181 fire approval.

Coatings – External Weather Sheet

- PVDF: 25 micron thick stoved fluorochemical coating which has excellent colour stability even at temperatures as high as 120°C.
- ARS/Abrasion Resistant: 28 micron thick polyester or polyurethane resin reinforced with polyamide high durability coating with exceptionally good handling characteristics.
- Alternatively the weather sheet can be supplied in mill finish, stucco embossed.

Coatings – Internal Weather Sheet

- Standard internal facing is white polyester coated, plain or stucco embossed.

Insulation Core

Two types of Polyisocyanurate (PIR) insulation core are available.

FIREsafe, LPCB approved insulation with zero ozone depletion potential (Zero ODP).

ECOsafte, LPCB approved, environmentally sustainable insulation with a low GWP (Global Warming Potential) receiving BREEAM credit (Pollution 4 Insulant GWP) 2006 and zero ozone depletion potential Zero ODP).

NBS type specifications are available from Kingspan envirocare Technical Service Department (Tel: 0800 587 0090).

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Performance

Thermal Insulation

Panel Thickness mm	U value W/m ² K
	HCFC Free $\lambda = 0.020$
40	0.46
50	0.38
60	0.35
80	0.25
100	0.21

U - Thermal transmittance W/m²K

λ - Long-term Thermal conductivity W/mK

Biological

Kingspan panels are normally immune to attack from mould, fungi, mildew and vermin.

No urea formaldehyde is used in the construction, and the panels are not considered deleterious.

Fire

Steel and aluminium outer and inner facings have Class 1 surface spread of flame to BS476: Part 7: 1987, and are Class 0, as defined by Building Regulations. The panels are rated FAA/SAA to BS476: Part 3: 1975.

Kingspan KS1000 DR roof panels up to 80mm thickness with steel facings are LPC approved.

Acoustics

All Kingspan - Low Pitch or Curved KS1000 DR panels have a single figure weighted sound reduction $R_w = 25$ dB.

Sound Reduction Index (SRI)	
Frequency (Hz)	SRI (dB)
125	18
250	20
500	24
1k	20
2k	29
4k	39

Building Regulations

Kingspan Roof - Low Pitch or Curved KS1000 DR panels conform to the following Building Regulation requirements:

- A. Structure.
- B. Fire: Class 0, FAA/SAA.
- L. Conservation of fuel & power.
- F. Ventilation.

Quality & Durability

Kingspan Insulated Panels are manufactured from the highest quality materials, using state of the art production equipment to rigorous quality control standards, complying with BS5750: Part 2, ISO9002 and EN29002 standards, ensuring long term reliability and service life.

Guarantees & Warranties

Kingspan will provide external coating and product warranties and guarantees on an individual project basis.

Packing

Standard Packing

Kingspan - Low Pitch or Curved KS1000 DR panels are stacked top side up. The top, bottom, sides and ends are protected with cardboard and timber packing and the entire pack is wrapped in plastic.

The number of panels in each pack depends on panel thickness, as shown in the table.

Typical pack height is 1100mm.

Panel core thickness	No. panels/pack (max.)
40	16
50	14
60	12
80	10
100	8

Sea Freight

Fully timber crated packs are available on projects requiring delivery by sea freight shipping, at additional cost.

Delivery

All deliveries (unless indicated otherwise) are by road transport to project site. Off loading is the responsibility of the client.

Site Installation Procedure

Site assembly instructions are available from Kingspan envirocare Technical Services Department.

Load Tables - DR1000

Single Span Condition - Unfactored load / Span Table*

Outer Sheet 0.5mm (Steel), Inner Sheet 0.4mm (Steel)

Panel Thickness	Load Type	Uniformly distributed loads kN/m ²							
		Span L in metres							
		1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
40mm	Downwards	3.63	2.52	1.98	1.44	1.15	0.85	-	-
	Uplift	4.04	3.36	2.94	2.36	1.97	1.57	-	-
50mm	Downwards	4.32	3.10	2.48	1.85	1.50	1.14	0.93	-
	Uplift	4.78	4.04	3.57	2.99	2.52	2.05	1.76	-
60mm	Downwards	5.00	3.67	2.97	2.27	1.86	1.45	1.20	0.94
	Uplift	5.53	4.47	4.21	3.65	3.11	2.56	2.21	1.86
80mm	Downwards	6.31	4.78	3.94	3.10	2.59	2.07	1.74	1.40
	Uplift	7.03	6.15	5.53	4.90	4.28	3.66	3.20	2.73
100mm	Downwards	7.57	5.86	4.90	3.93	3.33	2.72	2.32	1.92
	Uplift	8.49	7.53	6.82	6.11	5.25	4.39	3.84	3.28

Notes

1. Values have been calculated as described in the 'European Recommendations for the Design of Sandwich Panels' (ECCS), taking imposed loads, temperature and creep into account.
* The values shown are SLS loads. (Service limit state or "Working" loads)
2. For each value individual and combined load cases with appropriate load factors and temperatures have been considered.
3. The table is for medium and light coloured panels, as recommended for roofing purposes.
4. The following deflection limits have been used:
Downward loading $L/200$
Suction loading $L/150$
5. For intermediate values linear interpolation may be used.
6. The actual wind suction load resisted by the panel is dependant on the number of fasteners used and the material of the purlin. The fastener calculation should be carried out in accordance with the appropriate standard. For further advice please contact Kingspan envirocare Technical Services.
7. The allowable steelwork tolerance between bearing planes of adjacent purlins is +/-5mm.
8. Load span tables for panel specifications not shown are available from Kingspan envirocare Technical Services.

Double Span Condition - Unfactored load / Span Table*

Outer Sheet 0.5mm (Steel), Inner Sheet 0.4mm (Steel)

Panel Thickness	Load Type	Uniformly distributed loads kN/m ²							
		Span L in metres							
		1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
40mm	Downwards	3.29	2.58	2.20	1.82	1.59	1.36	1.21	1.05
	Uplift	3.43	2.74	2.38	2.02	1.80	1.57	1.43	1.28
50mm	Downwards	3.52	2.78	2.38	1.98	1.74	1.49	1.33	1.17
	Uplift	3.67	2.96	2.58	2.20	1.97	1.73	1.58	1.42
60mm	Downwards	3.73	2.97	2.55	2.13	1.88	1.62	1.45	1.27
	Uplift	3.91	3.17	2.77	2.37	2.12	1.87	1.71	1.54
80mm	Downwards	4.12	3.30	2.85	2.39	2.11	1.82	1.63	1.44
	Uplift	4.37	3.58	3.14	2.70	2.43	2.16	1.98	1.79
100mm	Downwards	4.47	3.60	3.12	2.63	2.32	2.01	1.80	1.59
	Uplift	4.77	3.93	3.46	2.99	2.70	2.40	2.20	2.00