KS1000 RW Roof System

Trapezoidal

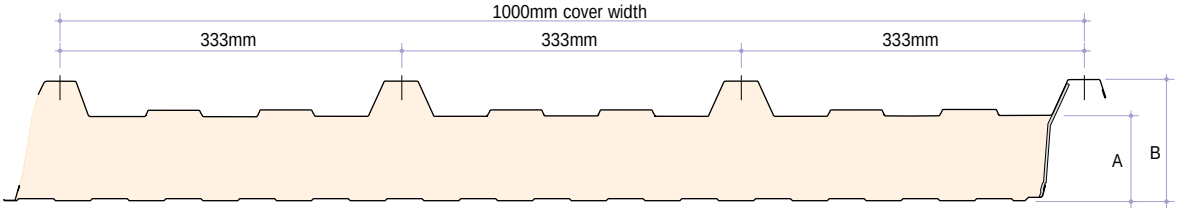
Application

The KS1000 RW Roof system is suitable for building applications with roof slopes of 4° and above.

Product Reference	Application Description
KS1000 RW	Standard trapezoidal roof panel.
KS1000 RW-FM	Trapezoidal roof panel with Factory Mutual (FM) approval for roof applications.
KS1000 RW-LPCB Ref. No. 260a/06 to LPS 1181	Trapezoidal roof panel with Loss Prevention Certification Board (LPCB) approval for roof applications.

Insurer Approved FIRESafe™ System

Dimensions & Weight



A - Core Thickness (mm)	40	50	60	70	80*	100*
B - Overall Dimension (mm)	75	85	95	105	115	135
Weight kg/m² 0.5/0.4 steel	9.9	10.3	10.7	11.0	11.5	12.3
Weight kg/m² 0.63/0.4 steel	11.8	12.2	12.6	12.9	13.4	14.2
Weight kg/m² 0.7/0.5 alum.†	5.6	6.0	6.4	6.7	7.2	8.0

*These panel thicknesses comply with Part L2 (England & Wales) and Part J (Scotland)

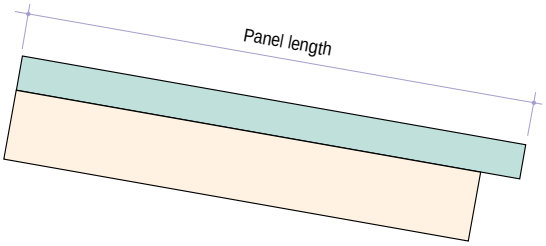
† Aluminium faced panels are not LPCB and FM certified.

Product Tolerance

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

Available Lengths

Standard lengths 1.8 to 12 metres. 12 to 22 metres can be supplied but may be subject to a transport surcharge. Panels less than 1.8m long which require a cut back can be provided, but will be charged at full 1.8m price, plus cutting cost.



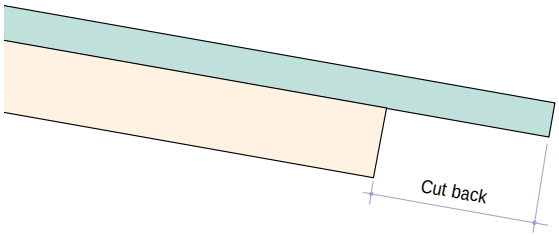
Panel End Cut Back

All panels are normally produced with a minimum cut back of 10mm. Cut backs up to 175mm can also be manufactured.

If flush ended panels (no cut back) are required they can be manufactured with one end flush and a 10mm cut back on the opposite end, based on panels exceeding 1.8m in length.

The recommended cut back for panel end lapping is 150mm.

Panels less than 1.8m long which require a cut back can be provided, but will be charged at full 1.8m price, plus cutting cost.



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Materials - Steel

Substrate

- HPS200/Celestia: ZA255 Galvalloy hot-dip zinc-aluminium alloy coated steel (= 95% Zn/=5% Al) to BS EN 10214: 1995, Grade Fe E220G with a Z275 zinc coating.
- PVDF: Galvatite, hot-dipped zinc coated steel to BS EN 10147: 1992. Grade Fe E220G with a Z275 zinc coating.
- Standard external sheet thickness 0.5mm, standard internal sheet thickness 0.4mm. Other thicknesses can be supplied to special order.

Coatings - External Weather Sheet

- HPS200 Plastisol: 200 micron thick high performance coating applied to the weatherside of the panel. Designed to achieve high levels of durability and colour stability, is highly resistant to damage in transit and on-site.
- PVDF: 27 micron thick stoved fluorocarbon coating which has excellent colour stability even at temperatures as high as 120°C.
- Celestia: 120 micron thick Plastisol coating. 16 metallic colours.
- Silicone Polyester: An economical coating with medium term life for worldwide use.
- Reverse side of sheet coated with a light grey polyester coating.
- The sheet is available in either plain or stucco embossed finish.

Coatings - Internal Liner Sheet

- Lining Enamel: 15 micron thick coating developed for use for the internal lining of insulated panels. Standard colour is “bright white” with an easily cleaned surface.
- HPS200 Plastisol: 200 micron thick coating used in areas where there is high internal humidity, or a corrosive environment.
- Stelvetite Food & Hygiene Safe: This is a 120 micron thick chemically inert polymer film bonded to steel suitable for cladding the interior of cold stores, food processing buildings and other hygiene applications.
- Reverse side of sheet coated with a light grey polyester coating.
- The sheet is available in either plain or stucco embossed finish.

Materials - Aluminium

Substrate

- Aluminium substrate, Grades 3003/4/5 series.
- Standard external sheet thickness 0.7mm, standard internal sheet thickness 0.5mm.

Coatings - External Weather Sheet

- PVDF: 25 micron thick stoved fluorocarbon 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.
- Silicone Polyester: An economical coating with medium term life for worldwide use.
- Alternatively the weather sheet can be supplied in mill finish, stucco embossed.

Coatings - Internal Liner Sheet

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

Insulation Core

- Polyisocyanurate (PIR): with zero ozone depletion (Zero ODP). Available in LPCB and FM insurer approved FIRESafe™ certified product range, please contact **Kingspan Technical Design Bureau**.

Seals

Factory Applied Side Lap Tape

All side laps have a factory applied anti condensation tape. Additionally a specially developed side lap tape is factory applied to panels for low-temperature chill stores at extra cost.

Factory Applied Side & End Lap Protection

If specifiers require additional under lap corrosion protection, this can be factory applied at extra cost.

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Performance

Thermal Insulation

Panel Thickness (mm)	U value W/m²k
40	0.43
50	0.35
60	0.30
70	0.26
80	0.25*
100	0.21*

U - Thermal transmittance W/m²K

* U-Value calculated in accordance with the method required by the Building Regulations Part L2 (England & Wales) and Building Standards Part J (Scotland)

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 BS 476: Part 7: 1987, and are Class 0, as defined by Building Regulations. The panel surfaces are rated FAA/SAA to BS 476: Part 3: 1975. KS1000 RW insurer approved FIRESAFE™ panels are available with FM and LPCB certification, with steel facings.

Acoustics

KS1000 RW panels comply with Building Regulations Part E for non-domestic buildings. **For residential, domestic, education and healthcare building applications, BB93 and HTM 2045 solutions, consult Kingspan Technical Design Bureau.**

All KS1000 RW panels have a single figure weighted sound reduction Rw = 25dB.

Sound Reduction Index (SRI) Tested						
Frequency Hz	125	250	500	1k	2k	4k
SRI dB	17.2	20.0	23.2	23.4	23.2	40.5

Building Regulations & Standards

Kingspan insulated roof and wall systems conform to the following Building Regulations and Standards (Non-domestic buildings):

i) Approved Document A: Structure (England & Wales)

ii) Approved Document B: Fire (England & Wales)

iii) Approved Document E: Resistance to the Passage of Sound (England & Wales)

iv) Approved Document Part L2: Conservation of Fuel & Power (England & Wales)

v) Building Standard Part D: Structural Fire Precautions (Scotland)

vi Building Standard Part H: Resistance to the Transmission of Sound (Scotland)

vii) Building Standard Part J: Conservation of Fuel & Power (Scotland)

viii) Building Standard Part L: Conservation of Fuel & Energy (Ireland)

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 ISO 9001: 2000 standard, 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

KS1000 RW panels are stacked weather sheet to weather sheet (to minimise pack height). The top, bottom, sides and ends are protected with foam and timber packing and the entire pack is wrapped in plastic.

The number of panels in each pack depends on panel thickness and length. The table below is shown as a guide. Quantities are reduced for exceptionally long panels. Typical pack height is 1100mm. Maximum pack weight is 1500kg.

Panel Core Thickness	40	50	60	70	80	100
No. panel/pack (max.)	17	15	13	11	11	7

Sea Freight

Fully timber crated packs are available on projects requiring delivery by sea freight shipping, at additional cost. Alternatively, steel containers can be used. Special loading charges apply.

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 the **Kingspan Technical Design Bureau**.

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Structural

Unfactored Load/Span Table (use calculated design windload values unfactored)

SPAN CONDITION	Core Thickness (mm)	Load Type	Uniformly Distributed Loads (kN/m²) Span L in Metres 1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
SINGLE SPAN	40	Downwards	3.55	3.01	2.58	2.23	1.89	1.50	1.19	0.94
		Suction	4.21	3.63	3.16	2.78	2.42	2.04	1.75	1.52
Outer Sheet	50	Downwards	4.04	3.47	3.01	2.63	2.31	1.95	1.58	1.28
0.5mm steel		Suction	5.01	4.37	3.84	3.22	2.67	2.26	1.93	1.68
Inner Sheet	60	Downwards	4.49	3.90	3.42	3.01	2.66	2.37	2.00	1.64
0.4mm steel		Suction	5.82	5.13	4.29	3.49	2.90	2.45	2.10	1.83
	70	Downwards	4.90	4.30	3.79	3.36	2.99	2.67	2.40	2.04
		Suction	6.64	5.78	4.58	3.73	3.10	2.63	2.26	1.96
L	80	Downwards	5.34	4.72	4.19	3.73	3.34	2.99	2.69	2.43
		Suction	7.48	6.08	4.83	3.94	3.28	2.78	2.39	2.08
	100	Downwards	6.02	5.37	4.81	4.32	3.89	3.51	3.17	2.88
		Suction	8.44	6.52	5.20	4.25	3.55	3.01	2.59	2.26
DOUBLE SPAN	40	Downwards	3.55	3.01	2.58	2.23	1.94	1.70	1.50	1.33
		Suction	3.13	2.63	2.26	1.97	1.75	1.56	1.41	1.28
Outer Sheet	50	Downwards	4.04	3.47	3.01	2.63	2.31	2.04	1.81	1.62
0.5mm steel		Suction	3.23	2.73	2.36	2.07	1.84	1.65	1.50	1.37
Inner Sheet	60	Downwards	4.49	3.90	3.42	3.01	2.66	2.37	2.11	1.89
0.4mm steel		Suction	3.30	2.81	2.44	2.15	1.92	1.73	1.57	1.44
	70	Downwards	4.90	4.30	3.79	3.36	2.99	2.67	2.40	2.15
		Suction	3.37	2.88	2.51	2.22	1.99	1.79	1.64	1.50
L L	80	Downwards	5.34	4.72	4.19	3.73	3.33	2.94	2.62	2.34
		Suction	3.44	2.96	2.58	2.29	2.05	1.86	1.70	1.56
	100	Downwards	6.02	5.37	4.81	4.22	3.70	3.28	2.92	2.63
		Suction	3.52	3.04	2.67	2.38	2.14	1.95	1.78	1.65

Notes:

1. Values have been calculated using the limit state method described in the "European Recommendations for the Design of Sandwich Panels" (ECCS document No.115 2001), taking imposed loads, temperature and creep into account.
2. For each value individual and combined load cases with appropriate load factors and temperatures have been considered. These are detailed under "Structural Performance" in the Building Design Section.
3. The table is for medium and light coloured panels, as recommended by Kingspan for roofs.
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 standard fastener pattern is shown in the construction details. When the panels are valley fixed to 1.6mm thick cold rolled steel purlins at 2m centres the allowable suction load is 1.8kN/m². For other fastener and purlin arrangements the allowable suction load can be calculated using the procedure shown in the design example under "Structural Performance" in the Building Design Section.
7. The allowable steelwork tolerance between bearing planes of adjacent purlins is $L/600$, where L is the purlin spacing.
8. Load span tables for panel specifications not shown are available from the **Kingspan Technical Design Bureau**.
9. FM approved panels spans must be limited to a maximum of 2 metres in single or double span conditions.