



# Slate & Tile Support KS1000/2000 TS/Nulok Data Sheet



# KS1000/2000 TS/Nulok Slate & Tile Support

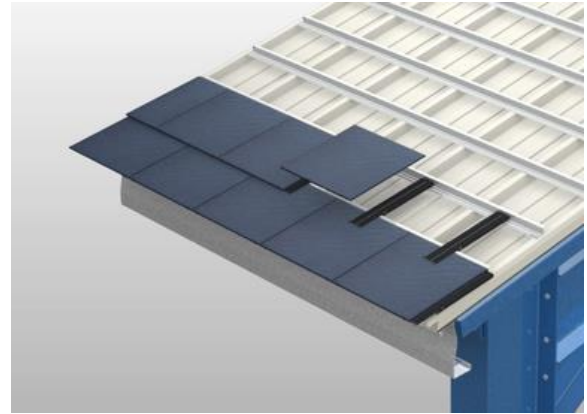
## Applications

The KS1000/2000 TS is an advanced insulated roof panel roof that has been designed to work in conjunction with the Nulok tile roofing system. This system provides all of the advantages of insulated panel technology with the aesthetic appeal of a traditional vernacular roof finish. The minimum pitch of the system is 5°.

## Available Lengths

Standard Lengths	1.8 – 14.5m
Longer Lengths (non-standard)	14.5- 29.3m
Shorter Lengths (non-standard)	Below 1.8m

Note: Additional costs and transport restrictions may apply for non-standard lengths. All lengths may change for export (outside of the UK). \*  
Maximum length is 18.3m for a 2 metre panel.



## Panel dimensions, Weight & Thermal Performance

Core Thickness (mm)	40	53	60	73	80	100	115	120	137	150
U-value (W/m <sup>2</sup> K)	0.46	0.38	0.35	0.28	0.25	0.20	0.18	0.16	0.15	0.14
Weight kg/m <sup>2</sup> 0.5/0.4 steel	9.9	10.4	10.7	11.2	11.5	12.3	12.8	13.1	13.7	14.2

The KS1000/2000 TS insulated roof panels have a Thermal Transmittance (U value), calculated using the method required by the Building Regulations Part L2 (England & Wales) and Building Standards Section 6 (Scotland).

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## Insulation Core

KS1000/2000 TS insulated roof panels are manufactured with an ECOsafe and FIREsafe polyisocyanurate (PIR) core.

## Fire

The external and internal faces of the panel to be Class 0 in accordance with the Building Regulations when tested to BS 476: Part 6: 2009 and Part 7: 1997. The panel is rated SAA when tested to BS 476: Part 3: 2004.

This FIREsafe system has passed all the requirements of LPS1181: 2014: Part 1: issue 1.2, Series of fire growth tests for LPCB approval and is certified to LPS1181 Grade EXT-B\*. Reaction to fire classification according to BS EN 13501-1:2007+A1:2009: B-s1,d0.

\*LPCB is limited to a maximum tile weight of 54 kg/m<sup>2</sup>.



LPS 1181: Issue 1.2  
Cert No: 260a & 186a

## Environmental

Kingspan Insulated Panels produced in the UK are certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Very Good'. Kingspan Insulated Panels directly contribute to BREEAM/LEED credits.

## Air Leakage

An air leakage rate of 3m<sup>3</sup>/hr/m<sup>2</sup> at 50Pa or less can be achieved when using Kingspan insulated roof and wall panels.

## System Acoustics

Sound Reduction Index (SRI)

Hz*	63	125	250	500	1K	2K	4K	5K
SRI (dB)	24	21	27	41	48	50	63	68

The KS1000/2000 TS insulated roof panel with the Nulok system has a predicted single figure weighted sound reduction of  $R_w = 41$  dB

\* Frequency

## 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.

## Materials

### Substrate

- Kingspan XL Forté, Kingspan Spectrum, Kingspan AQUAsafe, Kingspan AQUAsafe55 and Kingspan CLEANsafe: Metallic protected steel to BS EN 10346:2015.thickness 0.5mm.
- CLEANsafe 15: Metallic protected steel to BS EN10346:2015.thickness 0.4mm
- Stainless Steel: Austenitic Grade 316 stainless steel to BS EN 10088: Part 2: 2005, thickness 0.4mm.

### Coatings - External Weather Sheet

- Kingspan XL Forté: Consists of a multi-layer organic coating, embossed with a traditional leather-grain finish.
- Kingspan Spectrum: Consists of a coated semi-gloss finish with slight granular effect.

### Coatings - Internal Liner Sheet

- Kingspan CLEANsafe 15: The coating has been developed for use as the internal lining of insulated panels. Standard colour is "bright white" with an easily cleaned surface.
- Kingspan AQUAsafe: The coating has been developed for use as the internal lining of insulated panels to suit high humidity internal environments.
- Kingspan AQUAsafe 55: The coating has been developed for use as the internal lining of insulated panels to swimming pool internal environments.
- Kingspan CLEANsafe 120: The coating has been developed for use as the internal lining of insulated panels where a high level of cleanliness

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and hygiene is required, and the panels are to be cleaned down on a regular basis.

- **Stainless Steel:** The stainless steel liner has been developed for use as the internal lining of insulated panels in buildings with a very aggressive/corrosive internal environment.

## Panel End Cut Back

Standard Cut Back Eaves	75mm
Standard Cut Back Endlap	150mm
Minimum Cut Back	20mm
Maximum Cut Back	300mm

## Product Tolerance

Cut to Length	-5mm +5mm
Cover Width	-2mm +2mm
Thickness	-2mm +2mm
End Square	-3mm +3mm

## Handing

The KS1000/2000 TS insulated roof panel can be manufactured in both left to right handed (LH) and right to left handed (RH).

## Seals

Factory applied side & end lap weather seals.

## Panel Quality & Durability

KS1000/2000 TS insulated roof panels are manufactured from the highest quality materials, using state of the art production equipment to rigorous quality control standards, complying with BS EN ISO 9001 standard, ensuring long term reliability and service life. The panels are also being manufactured under Environmental Management System Certification BS EN ISO 14001. Compliant to BS OHSAS 18001 Occupational Health and Safety.



## Guarantee

Kingspan Total Panel Guarantee covering the structural and thermal performance for a period of up to 25 years.

## Packing

KS1000 TS insulated roof 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.

Core Thickness (mm)	40	50	60	70-80	100-120	137-150
No. of panels in Pack	17	15	13	11	7	6

Note: Applies to UK pack sizes. Please contact Kingspan Technical Services for export information.

## Sea Freight

Fully timber crated packs are available on projects requiring delivery by sea freight shipping, at additional costs. 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 Kingspan Technical Services.

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## Nulok component specification

### Nu-Lok Vitrified Ceramic Slates

- I.S. EN 1304: 1998 Clay Roofing Tiles for discontinuous laying – Product definitions and specification and Class B1 to I.S. EN 87: 1991 Ceramic floor and wall tiles – Definitions, classification, characteristics and marking
- Dimensions 400 mm long x 400 mm wide x 8.5mm thick
- Water absorption <0.05 % I.S. EN 99: 1992 Ceramic tiles – Determination of water absorption
- Bending strength > 45n/mm<sup>2</sup> I.S. EN 100: 1992 Ceramic tiles – Determination of modulus of rupture
- Weight/slate 3 Kg
- Total Installed Weight – 27.5 Kg/m<sup>2</sup>
- Colour Grey (other colours can be provided on request)

### Tests performed on Nulok Ceramic tiles

- BS EN 538 1994 - Flexural Strength Test
- BS EN 539 1994 - Physical Characteristic Permeability Test
- BS EN 539/2 1998 - Frost Resistance Test
- BS EN 1024 1997 Geometric Test
- BS EN 1304 1998 Product Definition and Specification Test
- Water Absorption
- Resistance to indirect traction by means of bending
- Resistance to indirect traction by means of bending after freezing
- Resistance to alterations caused by weather
- External Fire Exposure
- BS 476: Part 3 1958
- Wind Classification upto and including C2 (cyclonic wind test).

### Nu-Lok Natural Slate Range

For full slate and tile options, including solar panels, please contact Lilyash for full details – 0330 123 4440

### Nu-Lok Fixing System

#### Nu-Lok Metal Batten

- Hot dipped galvanised mild steel; DX51D+ Z275 to I.S. EN 10327:2004: Continuously hot-dip coated strip and sheet of low carbon steels for cold forming.
- Thickness 1.2 mm
- Width 48.1 mm
- Depth 24.3 mm
- Length 5400 mm

#### Nu-Lok Link Channel

- AZ55 Galvalume™ steel to ASTM A792/A792M – 03 Standard Specification for steel sheet, 55% aluminium-zinc alloy – coated by the hot dip process, with 0.01 mm to 0.02 mm thick black automotive e-coating, post applied after cutting and pressing.
  - Length 395 mm
  - Thickness 0.8 mm
- Nu-Lok Stainless Steel Wire Spring Clip

- 1.6 mm diameter, cold drawn, chemically blackened, 316S42 stainless steel to I.S. EN 10270-3:2001 Steel wire for mechanical springs. Part 3 Stainless spring steel wire
- Tensile strength 1460 n/mm<sup>2</sup> to 1700 n/mm<sup>2</sup>

#### Nu-Lok Stainless Steel Universal Spring Clip

- 2.03 mm thick, cold drawn, 316S42 stainless steel to I.S. EN 10270-3:2001
- Steel wire for mechanical springs. Part 3 Stainless spring steel wire

### Test performed on Nulok Fixing System

- AS 2050 1989 Weather Effectiveness of Roofing System Structural
  - Upwards to ultimate
  - Upwards to serviceability
  - Downwards to ultimate

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- Downwards to serviceability
- Florida Building Code Test Protocol TAS100-95 – test procedure for wind and wind driven rain resistance of discontinuous roof systems.

## Structural Tables

Unfactored load/span table (use unfactored calculated design wind load values).

### Tile Weight: Up to 15kg/m<sup>2</sup> (0.15kN/m<sup>2</sup>)

#### Single Span Condition

Panel Thickness (mm)	Load Types	Uniformly distributed loads kN/m <sup>2</sup>							
		Span L in metres							
		1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
40	Downwards	4.54	3.88	3.38	2.89	2.39	1.90	1.66	1.41
	Suction	5.17	4.59	4.26	3.98	3.67	3.36	3.13	2.90
50	Downwards	5.22	4.55	4.00	3.45	2.90	2.35	2.07	1.79
	Suction	5.92	5.32	4.99	4.67	4.34	4.01	3.72	3.42
60	Downwards	5.86	5.16	4.57	3.98	3.39	2.79	2.48	2.17
	Suction	6.63	6.02	5.67	5.33	4.98	4.64	4.29	3.95
70	Downwards	6.43	5.72	5.09	4.46	3.82	3.19	2.85	2.51
	Suction	7.32	6.71	6.35	5.99	5.64	5.28	4.88	4.48
80	Downwards	7.00	6.27	5.60	4.94	4.27	3.60	3.23	2.86
	Suction	7.98	7.36	6.99	6.63	6.26	5.89	5.44	5.00
100	Downwards	8.01	7.24	6.51	5.79	5.06	4.33	3.91	3.50
	Suction	8.96	8.35	7.86	7.38	6.89	6.41	6.02	5.63

#### Double Span Condition

Panel Thickness (mm)	Load Types	Uniformly distributed loads kN/m <sup>2</sup>							
		Span L in metres							
		1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
40	Downwards	4.11	3.38	3.06	2.75	2.42	2.11	1.93	1.76
	Suction	4.69	3.96	3.64	3.32	3.00	2.68	2.51	2.34
50	Downwards	4.34	3.60	3.26	2.94	2.60	2.27	2.09	1.91
	Suction	4.96	4.22	3.88	3.56	3.25	2.89	2.71	2.53
60	Downwards	4.56	3.80	3.45	3.11	2.76	2.42	2.23	2.04
	Suction	5.20	4.44	4.10	3.77	3.42	3.08	2.89	2.70
70	Downwards	4.74	3.96	3.61	3.25	2.90	2.54	2.34	2.15
	Suction	5.44	4.67	4.32	3.97	3.62	3.27	3.07	2.88
80	Downwards	4.92	4.13	3.76	3.40	3.03	2.67	2.46	2.26
	Suction	5.60	4.87	4.51	4.15	3.79	3.43	3.23	3.03
100	Downwards	5.23	4.42	4.04	3.66	3.28	2.89	2.67	2.46
	Suction	5.75	4.96	4.59	4.23	3.86	3.50	3.29	3.09

### Tile Weight: Up to 45kg/m<sup>2</sup> (0.45kN/m<sup>2</sup>)

#### Single Span Condition

Panel Thickness (mm)	Load Types	Uniformly distributed loads kN/m <sup>2</sup>							
		Span L in metres							
		1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
40	Downwards	3.91	3.23	2.65	2.09	1.62	1.16	0.89	0.61
	Suction	5.33	4.79	4.45	4.11	3.81	3.52	3.26	2.99
50	Downwards	4.54	3.81	3.18	2.56	2.04	1.52	1.29	0.89
	Suction	6.08	5.53	5.17	4.82	4.50	4.18	3.92	3.50
60	Downwards	5.13	4.37	3.69	3.02	2.45	1.88	1.53	1.18
	Suction	6.79	6.23	5.85	5.48	5.14	4.81	4.41	4.01
70	Downwards	5.66	4.87	4.15	3.43	2.82	2.21	1.82	1.44
	Suction	7.48	6.92	6.53	6.15	5.80	5.45	4.99	4.54
80	Downwards	6.19	5.38	4.61	3.85	3.20	2.56	2.14	1.73
	Suction	8.14	7.57	7.17	6.78	6.42	6.06	5.56	5.07
100	Downwards	7.14	6.27	5.44	4.60	3.89	3.18	2.71	2.25
	Suction	9.91	8.35	7.71	7.07	6.52	5.98	5.62	5.27

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## Tile Weight: Up to 45kg/m<sup>2</sup> (0.45kN/m<sup>2</sup>) Cont.

Double Span Condition		Uniformly distributed loads kN/m <sup>2</sup>							
Panel Thickness (mm)	Load Types	Span L in metres							
		1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
40	Downwards	3.62	2.97	2.62	2.27	1.97	1.67	1.48	1.29
	Suction	4.86	4.21	3.84	3.48	3.17	2.87	2.67	2.48
50	Downwards	3.84	3.17	2.80	2.44	2.12	1.81	1.61	1.42
	Suction	5.14	4.47	4.09	3.72	3.40	3.09	2.88	2.63
60	Downwards	4.04	3.35	2.97	2.59	2.26	1.94	1.73	1.53
	Suction	5.38	4.70	4.32	3.94	3.61	3.29	3.07	2.86
70	Downwards	4.21	3.51	3.11	2.72	2.38	2.05	1.83	1.62
	Suction	5.62	4.93	4.54	4.15	3.81	3.48	3.26	3.04
80	Downwards	4.38	3.66	3.26	2.85	2.51	2.16	1.94	1.72
	Suction	5.83	5.13	4.73	4.33	3.99	3.65	3.42	3.20
100	Downwards	4.67	3.93	3.51	3.09	2.72	2.36	2.12	1.88
	Suction	5.66	4.96	4.56	4.17	3.83	3.50	3.28	3.06

## Tile Weight: Up to 90kg/m<sup>2</sup> (0.90kN/m<sup>2</sup>)

Single Span Condition		Uniformly distributed loads kN/m <sup>2</sup>							
Panel Thickness (mm)	Load Types	Span L in metres							
		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
40	Downwards	4.59	3.38	3.02	2.22	1.57	0.93	-	-
	Suction	6.47	5.76	5.27	4.79	4.43	4.07	-	-
50	Downwards	5.21	4.40	3.55	2.71	1.99	1.28	-	-
	Suction	7.25	6.53	6.03	5.53	5.15	4.78	-	-
60	Downwards	5.79	4.96	4.06	3.17	2.39	1.62	-	-
	Suction	7.98	7.25	6.74	6.23	5.84	5.45	-	-
70	Downwards	6.33	5.48	4.54	3.60	2.77	1.94	-	-
	Suction	8.68	7.95	7.43	6.92	6.52	6.12	-	-
80	Downwards	6.86	5.99	5.01	4.04	3.16	2.28	1.64	1.00
	Suction	9.34	8.61	8.09	7.57	7.16	6.75	6.40	6.06
100	Downwards	7.81	6.92	5.86	4.81	3.85	2.89	2.18	1.47
	Suction	10.09	9.38	8.86	8.35	7.66	6.98	6.48	5.98

Double Span Condition		Uniformly distributed loads kN/m <sup>2</sup>							
Panel Thickness (mm)	Load Types	Span L in metres							
		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
40	Downwards	4.44	3.52	2.94	2.36	1.97	1.58	-	-
	Suction	6.27	5.36	4.78	4.24	3.82	3.43	-	-
50	Downwards	4.67	3.73	3.13	2.53	2.12	1.72	-	-
	Suction	6.58	5.65	5.06	4.47	4.07	3.67	-	-
60	Downwards	4.89	3.92	3.30	2.69	2.26	1.84	-	-
	Suction	6.85	5.90	5.30	4.70	4.29	3.88	-	-
70	Downwards	5.08	4.09	3.45	2.82	2.38	1.95	-	-
	Suction	7.10	6.15	5.54	4.93	4.51	4.09	-	-
80	Downwards	5.26	4.26	3.61	2.96	2.51	2.06	1.73	1.40
	Suction	7.33	6.36	5.74	5.13	4.70	4.27	3.96	3.65
100	Downwards	5.58	4.55	3.87	3.20	2.73	2.26	1.91	1.56
	Suction	7.16	6.20	5.58	4.96	4.54	4.12	3.81	3.50

### Notes:

1. Values have been calculated using the method described in BS EN 14509: 2013, for medium and light coloured panels.
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 by Kingspan for roofs.
4. The following deflection limits have been used: Downward loading L/200 - Suction loading L/150

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5. For intermediate values linear interpolation may be used.

6. The actual wind suction load resisted by the panel is dependent 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 Technical Services.

7. The allowable steelwork tolerance between bearing planes of adjacent purlins is  $\pm 5\text{mm}$ . For panel span for the 115mm, 120mm, 137mm and 150mm thick KS1000 TS insulated roof panels, please contact Kingspan Technical Services on 0800 587 0090.



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Please contact your local sales  
representative  
or visit [www.kingspanpanels.com](http://www.kingspanpanels.com)

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