Insulated Panels
UK & Ireland

PowerPanel Protected by Kingspan QuadCore® Assured

QuadCore® PowerPanel
Product Data Sheet

POWERED BY QuadCore® TECHNOLOGY

Kingspan®

QuadCore® PowerPanel
Product Data

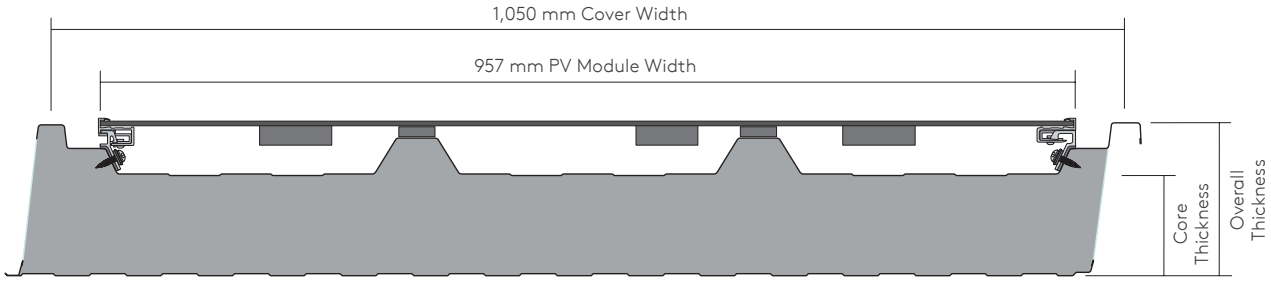
Applications

QuadCore® PowerPanel Roof Panel is a through-fix profiled insulated panel with high-efficiency back contact monocrystalline solar PV technology by LONGi. This panel can be used for building applications with roof pitches of 4° or more after deflection.

Available Lengths

QuadCore® PowerPanel Roof Panel is available in standard lengths from 3 metres to 18 metres.

Note: Additional costs and transport restrictions may apply for non-standard lengths. All lengths may change for export (outside of the UK and Ireland).



Dimensions, Thermal Performance, Output & Weight

Core Thickness (mm)	104	118	126	172
Overall Thickness (mm)	154	168	176	222
U-value (W/m²K)	0.18	0.16	0.15	0.11
Weight (kg/m²) (insulated panel + PV module)*	23.5	24.1	24.4	26.1
Cover Width (mm)	1,050			
Solar Cell	Back Contact Monocrystalline Silicon Solar Cells by LONGi.			
Module Power Output (Wp)	460 - 475			
Module Dimensions (mm)	2,274 x 957 x 5			
Module Weight (kg)	27.1			

The QuadCore® insulation used in QuadCore® PowerPanel Roof Panel has a Thermal Conductivity (λ) of 0.019 W/m.K

QuadCore® PowerPanel Roof Panel has a Thermal Transmittance (U-value), calculated using the method required by the Building Regulations Part L2 (England & Wales), Building Standards Section 6 (Scotland), Part L (Republic of Ireland) and Part F2 (Northern Ireland).

* For weight of panel only, see QuadCore® FutureProof Roof Panel product data sheet.

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Insulation Core

QuadCore® PowerPanel Roof Panel is manufactured with a HCFC, CFC and HFC free QuadCore® insulation core.

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Certification and Testing

Reaction to Fire

QuadCore® PowerPanel Roof Panels are classified B-s1,d0, when tested on the internal face of the product, according to the European Reaction to Fire classification system (Euroclasses) BS EN 13501-1: 2018 under the certified name PowerPanel (KS1050PP) when using the following internal liner:

- CLEAN*safe* 15.

Please contact Kingspan Tech-eXchange for information relating to the external face.

Roof Applications

QuadCore® PowerPanel Roof Panel is tested to:

- BROOF(t4) to BS EN 13501-5: 2016 under the certified name PowerPanel (KS1050PP) for panel thicknesses 104 mm - 126 mm and all roof pitches.

Fire Resistance

Fire resistance classifications are subject to panel thickness, orientation, method of assembly, and steel coating. Please contact Kingspan Tech-eXchange for project specific details.

Insurer Approvals

QuadCore® PowerPanel Roof Panel is tested to:

- FM 4478 approval standard Examination Standard for Roof-Mounted Rigid Photovoltaic Module Systems materials for thicknesses: 104 mm - 126 mm under the certified name PowerPanel KS1050PP.

Insurer approvals are large scale testing regimes that provide objective third-party testing, which is underpinned by quarterly, bi-annual and annual factory surveillance audits (depending on the region) to verify compliance. Insurer approvals are subject to panel thickness, cover width, orientation, method of assembly, steel coating and manufacturing facility. Please contact Kingspan Tech-eXchange for further information.

Environmental

Kingspan insulated panels produced in the UK and Ireland are certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Good'. QuadCore® Insulated Panel systems have Environmental Product Declarations in accordance with the requirements of EN 15804 + A2: 2019.

In addition, facilities located in Kingscourt, Holywell and Sherburn generate renewable energy onsite which contributes to that sites energy mix.

Recycled content calculations are available for all QuadCore® products via technical services. Kingspan insulated panels can directly contribute to BREEAM® / LEED® credits.

Air Leakage

An air leakage rate of 3 $m^3/hr/m^2$ at 50Pa or less can be achieved when using Kingspan insulated roof panels.

For information on detailing required to achieve lower air leakage rates please contact Kingspan Tech-eXchange.

Acoustic

Sound Reduction Index (SRI)

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
SRI (dB)	20	22	21	21	18	35	41	46

QuadCore® PowerPanel Roof Panel has a single figure weighted sound reduction Rw = 25 dB.

Materials

Substrate

Metallic protected steel to BS EN 10346: 2015.

Please contact Kingspan Tech-eXchange for information on other substrates.

For information on our photovoltaic module please see the specific section at the end of this document.

Coatings – External Weather Sheet

- Kingspan Spectrum: Consists of a coated semi-gloss finish with slight granular effect.

Coatings – Internal Liner Sheet

- Kingspan CLEAN*safe* 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.

QuadCore® PowerPanel
Product Data

Panel End Cut Back

Standard Cut Back Eaves	75 mm
Class A End Lap	75 mm

For further information in relation to end laps please contact Kingspan Tech-eXchange.

Product Tolerance

Cut to Length	± 5 mm
Cover Width	± 2 mm
Thickness (Core ≤ 100 mm)	± 2 mm
Thickness (Core > 100 mm)	± 2%
End Square	± 3 mm

Handing

The QuadCore® PowerPanel Roof Panel can be manufactured in both left to right handed (LH) and right to left handed (RH).

Quality & Durability

QuadCore® PowerPanel Roof Panel is 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, Energy Management System Certification BS EN ISO 50001, Occupational Health and Safety Certification BS EN ISO 45001 and Compliance Management Systems BS EN ISO 37301.

Packing

QuadCore® PowerPanel Roof Panels are stacked with the top sheet facing up to protect the photovoltaic module. The top and sides are protected by either cardboard or polystyrene and spiral wrap stretch polyfilm. The number of panels in a pack will vary depending on thickness.

Core Thickness (mm)	104	118	126	172
No. Panels per Pack	8	7	7	5

Note: Applies to UK pack sizes. Please contact Kingspan Tech-eXchange for export information.

Warranty

QuadCore® Insulated Panel

QuadCore® Assured Panel Warranty

- 25 years thermal performance
- 25 years fire performance
- 25 years structural performance
- 25 years environmental performance
- Up to 40 years coating performance

LONGI PV Module: LGi5-60HTBB / 460-475M

- Up to 25 year product warranty
- Up to 30 year linear power warranty

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 and construction details are available from Kingspan Tech-eXchange.

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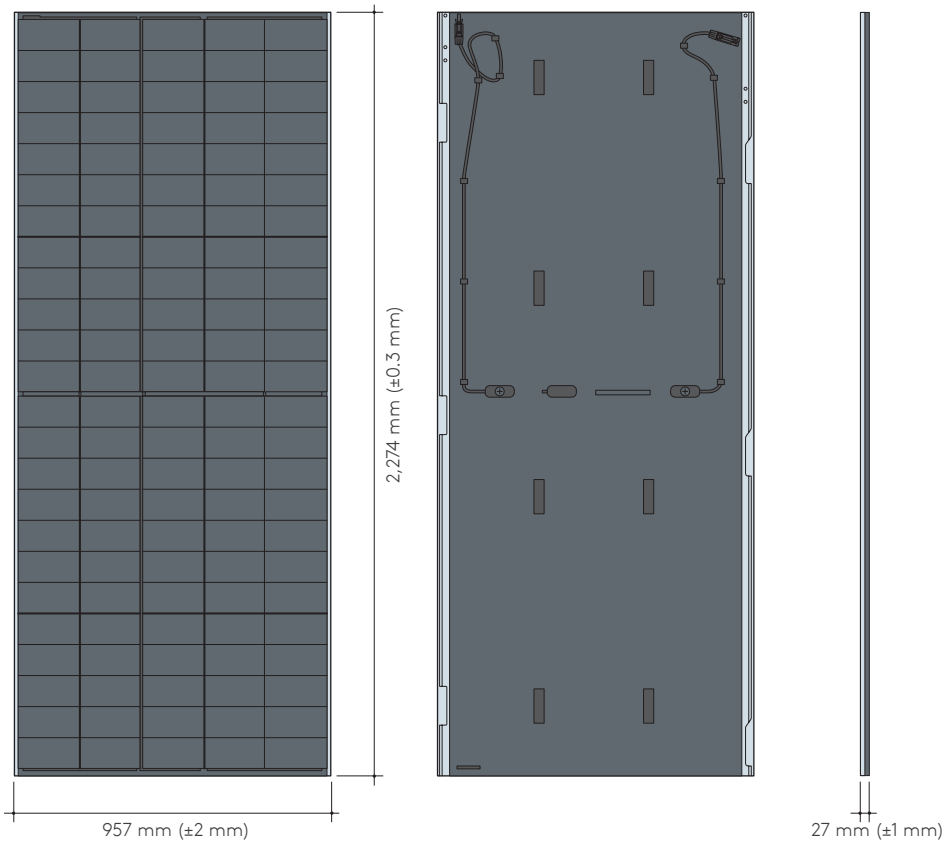
PV Module Product Data
LONGi LGi5-60HTBB / 460-475M



Mechanical Parameters

Cell orientation	120 (5x24)
Junction box	IP68, three diodes
Output cable	4 mm^2, +1,600 mm / -1,300 mm (length can be customised)
Glass	Double glass Front: 2 mm tempered glass Rear: 2 mm black glazed
Weight	27.1 kg
Dimensions	2,274 mm x 957 mm x 27 mm

Operating Parameters

Operational temperature	-40 °C to +85 °C
Maximum system voltage	DC 1,500 V (IEC)
Maximum series fuse rating	25A
V_{oc} and I_{sc} tolerance	± 5%
Power output tolerance	0 to 3%
Nominal operating cell temperature	45 (±2) °C
Protection class	Class II
Fire rating	Class C

Temperature Ratings (STC)

Temperature Coefficient of I_{sc}	0.050% / °C
Temperature Coefficient of V_{oc}	-0.230% / °C
Temperature Coefficient of P_{max}	-0.290% / °C

Mechanical Loading

Front side maximum static loading	5,400 Pa
Rear side maximum static loading	2,400 Pa
Hailstone test	25 mm hailstone at 23 m/s

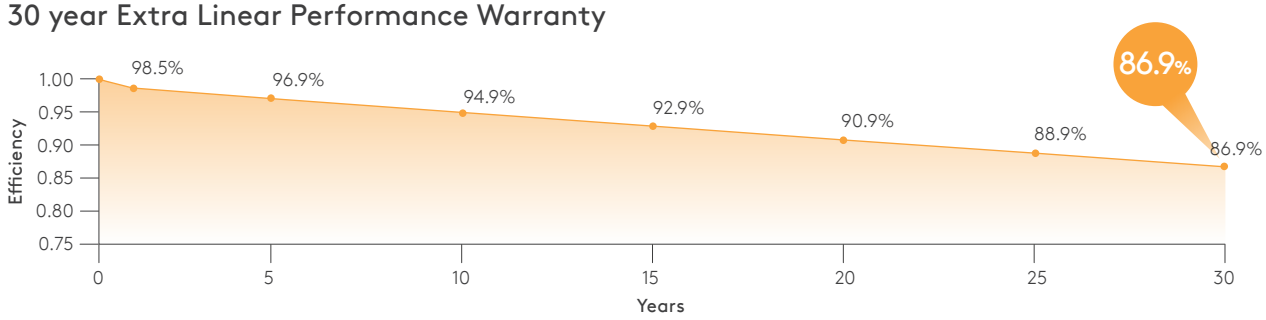
PV Module Product Data
LONGi LGi5-60HTBB / 460-475M

Electrical Characteristics

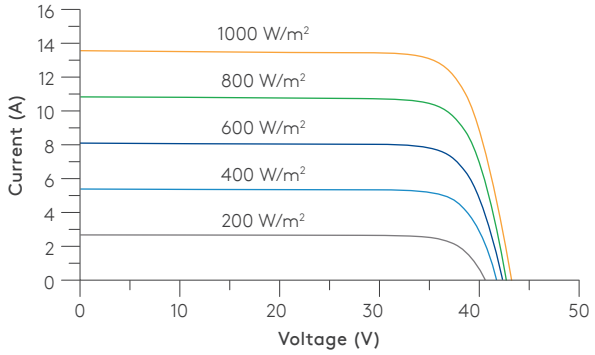
Module type	LGi5-60HTBB-460M		LGi5-60HTBB-465M		LGi5-60HTBB-470M		LGi5-60HTBB-475M	
Testing condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power (P_{max} /W)	460	378	465	381	470	385	475	388
Open circuit voltage (V_{oc}/V)	43.33	43.70	43.41	43.80	43.50	43.90	43.59	44.00
Short circuit current (I_{sc} /A)	13.53	10.81	13.55	10.82	13.57	10.83	13.59	10.84
Voltage at maximum power(V_{mp}/V)	36.73	36.80	36.81	37.00	36.90	37.10	36.95	37.30
Current at maximum power (I_{mp} /A)	12.53	10.27	12.64	10.31	12.75	10.35	12.86	10.39
Module efficiency (%)	21.1		21.4		21.6		21.8	

STC: AM 1.5 1000 W/m² 25 °C. **NOCT:** AM 1.5 800 W/m² 20 °C 1 m/s.

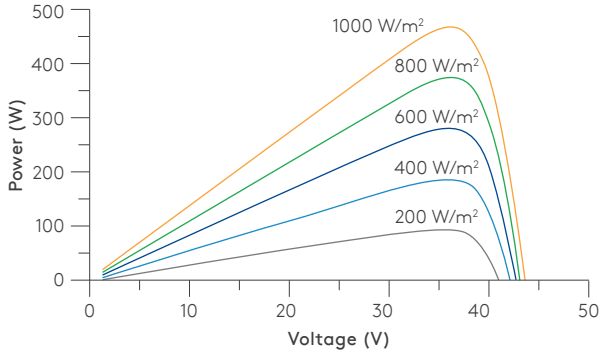
30 year Extra Linear Performance Warranty



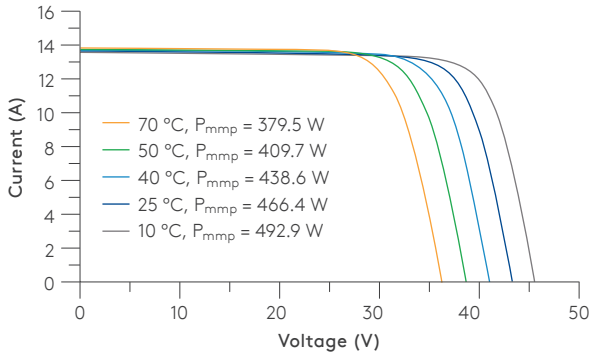
I-V Curve (LGi5-60HTBB-465M)



P-V Curve (LGi5-60HTBB-465M)



I-V Curve (LGi5-60HTBB-465M)



Product Data: Load / Span Tables

External sheet 0.465 mm (steel), internal sheet 0.38 mm (steel). Load / span tables to be compared against calculated characteristic (i.e. unfactored) wind load values.

Single Span

Core Thickness (mm)	Load Type	Uniformly distributed imposed load (kN/m²)																																
		Span (m)																																
		0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0
104	Pressure	9.96	7.41	5.88	4.86	4.13	3.59	3.16	2.82	2.55	2.31	2.12	1.95	1.80	1.68	1.56	1.46	1.38	1.23	1.06	0.92	0.79	0.68	0.59	0.50	0.43	0.36	0.30	-	-	-	-	-	-
	Suction	10.31	7.76	6.23	5.21	4.48	3.94	3.51	3.17	2.90	2.66	2.47	2.30	2.16	2.03	1.92	1.82	1.73	1.65	1.57	1.51	1.45	1.38	1.30	1.22	1.15	1.09	1.03	-	-	-	-	-	-
118	Pressure	9.95	7.40	5.88	4.86	4.13	3.58	3.16	2.82	2.54	2.31	2.11	1.94	1.80	1.67	1.56	1.46	1.37	1.29	1.22	1.15	1.02	0.89	0.77	0.67	0.59	0.51	0.44	0.37	0.32	-	-	-	-
	Suction	10.31	7.77	6.24	5.22	4.49	3.94	3.52	3.18	2.90	2.67	2.47	2.31	2.16	2.03	1.92	1.82	1.73	1.65	1.58	1.51	1.45	1.40	1.35	1.30	1.25	1.21	1.16	1.09	1.03	-	-	-	-
126	Pressure	9.95	7.40	5.87	4.85	4.12	3.58	3.15	2.81	2.54	2.30	2.11	1.94	1.80	1.67	1.56	1.46	1.37	1.29	1.21	1.15	1.09	1.01	0.89	0.78	0.68	0.59	0.52	0.45	0.39	0.33	-	-	-
	Suction	10.32	7.77	6.24	5.22	4.49	3.95	3.52	3.18	2.91	2.67	2.48	2.31	2.16	2.04	1.92	1.82	1.74	1.65	1.58	1.52	1.46	1.40	1.35	1.30	1.26	1.22	1.18	1.15	1.08	1.02	-	-	-

Double Span

Core Thickness (mm)	Load Type	Uniformly distributed imposed load (kN/m²)																																
		Span (m)																																
		0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0
104	Pressure	9.16	6.70	5.24	4.29	3.61	3.12	2.73	2.43	2.19	1.90	1.64	1.43	1.26	1.11	0.98	0.87	0.78	0.70	0.62	0.56	0.50	0.45	0.40	0.36	0.32	-	-	-	-	-	-	-	-
	Suction	9.45	7.00	5.55	4.60	3.94	3.44	2.87	2.43	2.10	1.84	1.64	1.47	1.34	1.23	1.13	1.05	0.98	0.92	0.86	0.82	0.77	0.74	0.70	0.67	0.64	-	-	-	-	-	-	-	-
118	Pressure	9.18	6.71	5.25	4.29	3.61	3.11	2.72	2.41	2.17	1.97	1.75	1.53	1.34	1.19	1.05	0.94	0.84	0.75	0.68	0.61	0.55	0.49	0.44	0.40	0.36	0.32	-	-	-	-	-	-	-
	Suction	9.48	7.02	5.57	4.61	3.94	3.44	3.03	2.57	2.23	1.95	1.74	1.57	1.42	1.30	1.20	1.12	1.04	0.98	0.92	0.87	0.83	0.79	0.75	0.72	0.69	0.66	-	-	-	-	-	-	-
126	Pressure	9.19	6.72	5.26	4.29	3.61	3.10	2.71	2.41	2.16	1.95	1.78	1.58	1.39	1.23	1.09	0.98	0.88	0.79	0.71	0.64	0.57	0.52	0.47	0.42	0.38	0.34	0.31	-	-	-	-	-	-
	Suction	9.50	7.04	5.58	4.62	3.95	3.45	3.06	2.65	2.30	2.02	1.80	1.62	1.47	1.35	1.24	1.15	1.08	1.01	0.95	0.90	0.85	0.81	0.78	0.74	0.71	0.68	0.66	-	-	-	-	-	-

1. Values have been calculated using the method described in BS EN 14509: 2013 for dark coloured panels.
2. The following deflection limits have been used:
   a. Short Term Pressure loading $^{L}/_{200}$
   b. Short Term Suction loading $^{L}/_{150}$
   c. Long Term loading $^{L}/_{100}$
3. All panel thicknesses have been calculated with a minimum End support width of 50 mm and Intermediate support width of 50 mm. Larger support widths are possible.
4. The actual wind suction resisted by the panel is dependent upon the number of fasteners and the material of the supporting element.
5. The fastener calculation should be carried out in accordance with the appropriate standards.
6. For intermediate values linear interpolation may be used.
7. The allowable steelwork tolerance between bearing planes of adjacent supports is ±5 mm.

Product Data: Load / Span Tables

External sheet 0.465 mm (steel), internal sheet 0.38 mm (steel). Load / span tables to be compared against calculated characteristic (i.e. unfactored) wind load values.

Triple Span

Core Thickness (mm)	Load Type	Uniformly distributed imposed load (kN/m²)																																
		Span (m)																																
		0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0
104	Pressure	9.96	7.41	5.88	4.86	4.13	3.59	3.16	2.82	2.55	2.29	2.00	1.76	1.56	1.39	1.24	1.12	1.01	0.91	0.82	0.75	0.68	0.62	0.56	0.51	0.46	0.42	0.38	0.35	0.31	-	-	-	-
	Suction	10.31	7.76	6.23	5.21	4.48	3.94	3.43	2.93	2.56	2.26	2.03	1.84	1.68	1.54	1.43	1.33	1.25	1.17	1.10	1.04	0.99	0.94	0.90	0.86	0.82	0.78	0.75	0.73	0.70	-	-	-	-
118	Pressure	9.95	7.40	5.88	4.86	4.13	3.58	3.16	2.82	2.54	2.31	2.10	1.86	1.65	1.47	1.32	1.19	1.07	0.97	0.88	0.80	0.73	0.67	0.61	0.56	0.51	0.46	0.42	0.38	0.35	0.32	-	-	-
	Suction	10.31	7.77	6.24	5.22	4.49	3.94	3.52	3.06	2.67	2.37	2.13	1.93	1.77	1.63	1.51	1.41	1.32	1.24	1.17	1.11	1.05	1.00	0.95	0.91	0.87	0.84	0.80	0.77	0.75	0.72	-	-	-
126	Pressure	9.95	7.40	5.87	4.85	4.12	3.58	3.15	2.81	2.54	2.30	2.11	1.91	1.69	1.51	1.36	1.23	1.11	1.01	0.92	0.83	0.76	0.69	0.63	0.58	0.53	0.48	0.44	0.40	0.37	0.34	0.30	-	-
	Suction	10.32	7.77	6.24	5.22	4.49	3.95	3.52	3.13	2.74	2.43	2.19	1.98	1.82	1.67	1.55	1.45	1.36	1.28	1.20	1.14	1.08	1.03	0.98	0.94	0.90	0.87	0.83	0.80	0.77	0.75	0.72	-	-

1. Values have been calculated using the method described in BS EN 14509: 2013 for dark coloured panels.
2. The following deflection limits have been used:
   a. Short Term Pressure loading $^{L}/_{200}$
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   c. Long Term loading $^{L}/_{100}$
3. All panel thicknesses have been calculated with a minimum End support width of 50 mm and Intermediate support width of 50 mm. Larger support widths are possible.
4. The actual wind suction resisted by the panel is dependent upon the number of fasteners and the material of the supporting element.
5. The fastener calculation should be carried out in accordance with the appropriate standards.
6. For intermediate values linear interpolation may be used.
7. The allowable steelwork tolerance between bearing planes of adjacent supports is ±5 mm.

Contact Details

United Kingdom

Kingspan Limited
Greenfield Business Park No. 2
Greenfield | Holywell | Flintshire
North Wales | CH8 7GJ

T: +44 (0) 1352 716 100
E: technical@kingspanpanels.com
www.kingspanpanels.co.uk

Ireland

Kingspan Limited
Carrickmacross Road
Kingscourt | Co. Cavan
A82 E897

T: +353 (0) 42 9698 529
E: technical.ireland@kingspan.com
www.kingspanpanels.ie

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