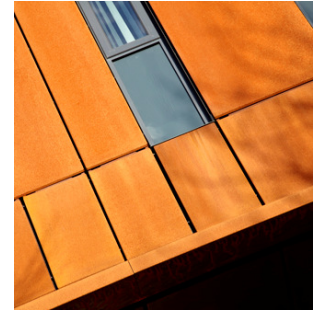


Cor-Ten®

Cor-Ten® is a weathered steel façade, available in three different cassette options and installed on a specifically designed Benchmark Karrier Panel.

WEATHERED STEEL



FAÇADE DATA

Materials

Benchmark weathered steel is a weather resistant steel created by alloying copper, chromium and nickel and adding phosphorous which makes the material best suited for aesthetic fascias.

The top layer of the material reacts with atmospheric elements to form a rust coloured protective layer which not only makes the steel virtually maintenance free but also provides a pleasing and consistent finish.

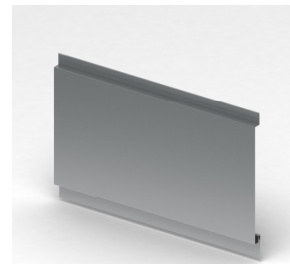
Dimensions

The maximum visible face dimensions for each cassette are subject to wind loadings. Please contact Benchmark Technical Services for maximum dimensions available relevant to each cassette option.

Product Tolerances

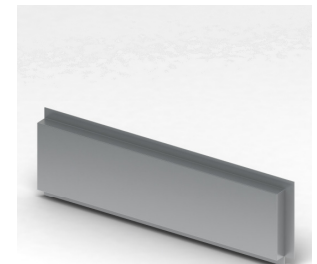
Length	-2mm	+2mm
Width	-2mm	+2mm
Thickness	-2mm	+2mm
Squareness	-2mm	+2mm

CASSETTE OPTIONS Profile Options



Interlocking Plank

Cassette Thickness:
1.5mm



Recessed Fix

Cassette Thickness:
1.5mm, 3.0mm.

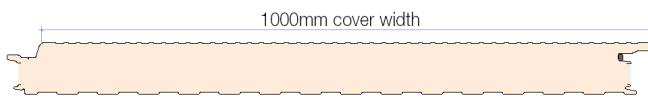


Hook On

Cassette Thickness:
1.5mm, 3.0mm

Product Data Sheet

KARRIER PANEL DATA



Product Tolerances

Length	-2mm	+2mm
Width	-2mm	+2mm
Thickness	-2mm	+2mm
End Squareness	-3mm	+3mm
Flatness (per metre)	-2mm	+2mm

Available Lengths

Standard length is 1.8 to 12 metres. Panel lengths up to 17 metres are available. Panels less than 1.8 metres long can be supplied and are subject to an extra charge. These panels cannot be end lapped.

Materials

Steel Substrate

- S220GD+ZA hot-dip zinc/aluminium Galfan coated metal to BS EN10214: 1992.
- Standard external sheet thickness 0.63mm, standard internal sheet thickness 0.4mm.

Coatings - External Sheet

- Kingspan XL Forté TM. Colour is Merlin Grey.
- Reverse side of sheet coated with a light grey polyester coating.

Coatings - Internal Liner

- Standard polyester coating developed for use for the internal lining of insulated panels. Standard colour is "bright white" with an easily cleaned surface.
- Foodsafe hygienic coating developed for use where the liner is exposed to foodstuffs and is regularly cleaned. Colour white.
- Kingspan XL Forté TM coating for internal high humidity environments. Colour white.
- Reverse side of sheet coated with a light grey polyester coating.

Insulation Core

Polyisocyanurate (PIR): EcoSafe with zero Ozone Depletion Potential (zero ODP). LPCB insurer approved FIREsafe certified product.

Factory Applied Side Joint Seal

All side joints have a factory-applied seal fitted into the groove to automatically seal the joint between panels.

Fire

The steel outer and inner facings of the Karrier Panel have a Class 1 surface spread of flame to BS476 - 7: 1987, and are Class 0, as defined by Building Regulations.

Biological

Benchmark insulated 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.

Product Data Sheet

SYSTEM WEIGHT

Benchmark weathered steel system has an overall typical weight depending upon Karrier Panel thickness:

Interlocking Plank Cassette Option;

Karrier Panel Thickness (mm)	60	70	80	100	120	140	150
Weight (Kg/m ²)*	26.5	26.9	27.3	28.1	28.9	29.6	30.1

Recessed Fix Cassette Option**;

Karrier Panel Thickness (mm)	60	70	80	100	120	140	150
Weight (Kg/m ²)*	38.5	38.9	39.3	40.1	40.9	41.6	42.1

Hook On Cassette Option**;

Karrier Panel Thickness (mm)	60	70	80	100	120	140	150
Weight (Kg/m ²)*	40.5	40.9	41.3	42.1	42.9	43.6	44.1

*Based on complete system - panel, fixing and cassette weight inclusive. For Project Specific weights, please contact Benchmark Technical Services Department.

** Please note the weights above reference the maximum gauge thickness available for the cassette option as stated. A decrease in material gauge will reduce the overall typical weights. Please contact Benchmark Technical Services should further information be required.

SYSTEM ATTACHMENT

Interlocking Plank

Interlocking Plank Cassettes are attached to aluminium tophats using rivets. Sealant tape is used to isolate the cassette from the surface of the tophat. The tophats are then fixed to the Karrier Panel using KSAFL6 fasteners.

Recessed Fix Option

Recessed fix cassettes are attached to aluminium tophats using rivets. Sealant tape is used to isolate the cassette from the surface of the tophat. The tophats are then fixed to the Karrier Panel using KSAFL6 fasteners.

Hook On Cassette Option

A vertical mullion is attached to the face of the Karrier Panel using KSAFL6 fasteners. A pin is inserted into the mullion and attached at the right location with a clip that is screwed to the mullion to secure the hook on attachment. The Cassette is then hooked onto the pin.

SYSTEM PERFORMANCE

Thermal Insulation

Thermal Transmittance (U value) calculated in compliance with Building Regulations Approved Documents L2A & L2B (England & Wales), Technical Handbooks Domestic and Non-Domestic Sections 6 (Scotland), Part F2 (Northern Ireland) and Part L (Republic of Ireland - based on the Overall Heat Loss Method).

Karrier Panel Thickness (mm)	60	70	80	100	120	140	150
U-value (W/m ² K)	0.35	0.30	0.27	0.21	0.18	0.15	0.135

Acoustics

Benchmark Weathered Steel Façade System has a single figure weighted sound reduction $R_w = 24\text{dB}$.


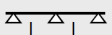
Sound Reduction Index (SRI)

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
SRI (dB)	20	15	17	23	18	25	40	46

STRUCTURAL

LOAD/SPAN TABLE FOR KARRIER PANEL

(To be checked against unfactored design wind-loads)

Span Condition	Core Thickness (mm)	Load Type	Uniformly Distributed Loads (kN/m ²)										
			Span L in Metres										
			2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
Single-span													
	60	Pressure	4.05	3.35	2.89	2.42	2.11	1.79	1.57	1.35	1.19	1.03	0.91
		Suction	3.63	2.95	2.52	2.08	1.79	1.49	1.29	1.08	0.94	0.79	0.69
	70	Pressure	4.83	4.12	3.58	3.03	2.66	2.28	2.01	1.74	1.55	1.35	1.21
		Suction	4.43	3.60	3.09	2.58	2.26	1.94	1.70	1.46	1.28	1.10	0.97
	80	Pressure	5.39	4.85	4.26	3.64	3.21	2.78	2.47	2.15	1.92	1.69	1.52
		Suction	4.98	4.03	3.46	2.88	2.53	2.17	1.93	1.69	1.52	1.35	1.23
	100	Pressure	5.39	4.85	4.48	4.10	3.83	3.56	3.35	2.96	2.67	2.37	2.15
		Suction	5.36	4.78	4.10	3.42	3.00	2.57	2.29	2.00	1.80	1.60	1.46
Double-span													
	60	Pressure	4.64	4.11	3.67	3.22	2.76	2.29	1.98	1.66	1.46	1.26	1.13
		Suction	3.93	3.15	2.71	2.26	1.98	1.69	1.51	1.32	1.19	1.06	0.96
	70	Pressure	5.05	4.54	4.19	3.84	3.30	2.75	2.36	1.97	1.73	1.48	1.32
		Suction	4.49	3.60	3.09	2.58	2.26	1.94	1.73	1.51	1.36	1.21	1.10
	80	Pressure	5.39	4.85	4.48	4.10	3.67	3.23	2.77	2.30	2.01	1.71	1.52
		Suction	4.98	4.03	3.46	2.88	2.53	2.17	1.93	1.69	1.52	1.35	1.23
	100	Pressure	5.39	4.85	4.48	4.10	3.83	3.56	3.28	2.99	2.60	2.20	1.94
		Suction	5.36	4.78	4.10	3.42	3.00	2.57	2.29	2.00	1.80	1.60	1.46

Notes:

- Values have been calculated using the limit state method in the "European Recommendations for the Design of Sandwich Panels" (ECCS document No.115 2001), taking imposed loads, temperature and creep into account.
- For each value individual and combined load cases with appropriate load factors and temperatures have been considered. These are detailed under "Structural Performance" in Building Design Section.
- The table is for dark coloured panels.
- The following deflection limits have been used:
Pressure Loading L/100
Suction Loading L/100
- For intermediate values linear interpolation may be used.
- The actual wind suction load resisted by the panel is dependent upon the number of fasteners used and material of the rail. The fastener calculation should be carried out in accordance with the appropriate standard. For further advice please contact Benchmark Envirocare Technical Services.
- The allowable tolerance between bearing planes of adjacent supports is L/600, where L is the distance between supports.
- Load span tables for spans outside of those shown are available from the Benchmark Technical Services department.

Product Data Sheet

PACKING AND STORAGE

Weathered Steel Cassettes

The cassettes are packed on a pallet with cardboard on top. Cardboard is also placed between each set of cassettes. A completed pack is wrapped in cardboard and wood is fixed around the top and sides. Packaging is completed by shrink wrapping the entire pallet in polythene. If packs of cassettes cannot be kept in a building they should be covered with a weatherproof sheet ensuring that the sheet drains water away effectively and does not allow ponding on top of the pack. It should also allow air circulation through the stacks.

Store packs in a secure area, where they will not be damaged or stolen.

Karrier Panel

The Benchmark Karrier Panels are stacked horizontally. Removable hot melt adhesive is laid between each panel. The top, bottom, sides and ends are protected with polystyrene and timber packing and the entire pack is wrapped in polythene. The number of panels in each pack depends on panel length and weight. Typical pack height is 1100mm. Maximum pack weight 1500kg.

Karrier Panel Thickness (mm)	60	70	80	100	120	140	150
Panels per pack	18	14	12	11	9	7	7

DELIVERY

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

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.

HANDLING

Lift cassettes up horizontally out of package. Do not pull them out from one side. Avoid scratching the surface of the cassettes.

Before the oxide layer is developed some rust will dissolve in the rainwater. Ensure no porous materials are stored near to the location of the installation of the cassettes where staining could occur due to rain. Do not install cassettes in the rain

SITE INSTALLATION PROCEDURE

Site assembly instructions are available from the Kingspan Field Service Department.

QUALITY & DURABILITY

Benchmark components are manufactured from the highest quality materials to rigorous quality control standards, complying with ISO 9001:2000 standard, ensuring long-term reliability and service life.

GUARANTEES & WARRANTIES

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