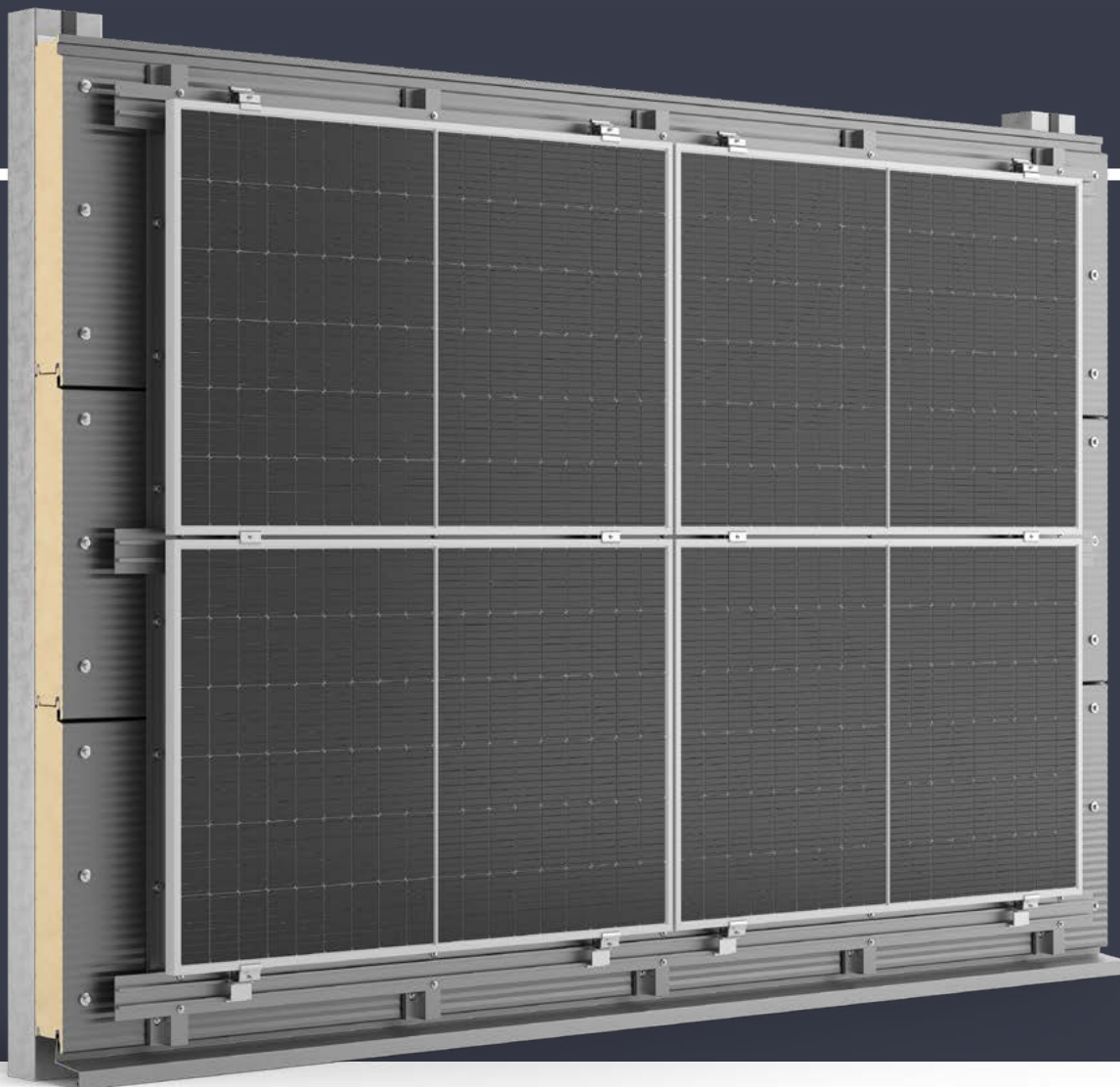


Insulated Panels
CEME Division

PowerWall Karrier

Wall Solar PV Mounting Solution



Buildings and the buildings construction sector combined are responsible for over one-third of global final energy consumption and nearly 40% of total direct and indirect CO₂ emissions*.

* iea.org

Why change is needed?

The undeniable impact of our day-to-day activities places decarbonising the built environment as a major factor in mitigation of climate change.

Innovation and deployment of clean energy solutions, on both existing buildings and new construction, is essential in meeting climate change goals.

What we can do?

Buildings are a source of enormous untapped energy efficiency potential.

We have the ability to futureproof our buildings - optimise energy efficiency, reduce carbon emissions and create healthy, resilient spaces in which to live and work. [Here's how...](#)

Complete façade solutions including photovoltaic modules

Photovoltaic façade panels are a complete solution, supplied with the entire mounting system. The mounting system consists of special aluminium profiles, allowing the module to be mounted to Karrier panels both vertically and horizontally. A photovoltaic ventilated façade is the perfect solution for installing a photovoltaic structure in a building. In this way, energy can be extracted from solar radiation, while enhancing the aesthetic qualities of the building in question, thus complementing the architecture of the building. In addition to combining design and aesthetics, photovoltaic facades have numerous features that directly benefit the functionality of the building, as well as the environment and walls.

Product highlight

- Half-cell lower operating temperature
- Power from 200 W/m²
- Above 20% module efficiency
- Greater than 80% module efficiency after 30 years
- Less than 2% efficiency degradation in the first year
- Generates savings through the generation of free electricity
- The Karrier system ensures adequate ventilation of the photovoltaic modules, contributing to the stable operation of the photovoltaic modules
- Stable construction supported by certification
- Improved insulation performance of the building
- Every project is subjected to an efficiency analysis

Wall-mounted system with photovoltaic modules based on the Karrier wall panel, specially designed and certified to carry loads from the external façade cladding up to 40 kg/m², and the PV modules. The system includes a complete set of mounting accessories, allowing the PV module to be installed to the Karrier panels both vertically and horizontally.

System components



Karrier Architectural Wall Panel

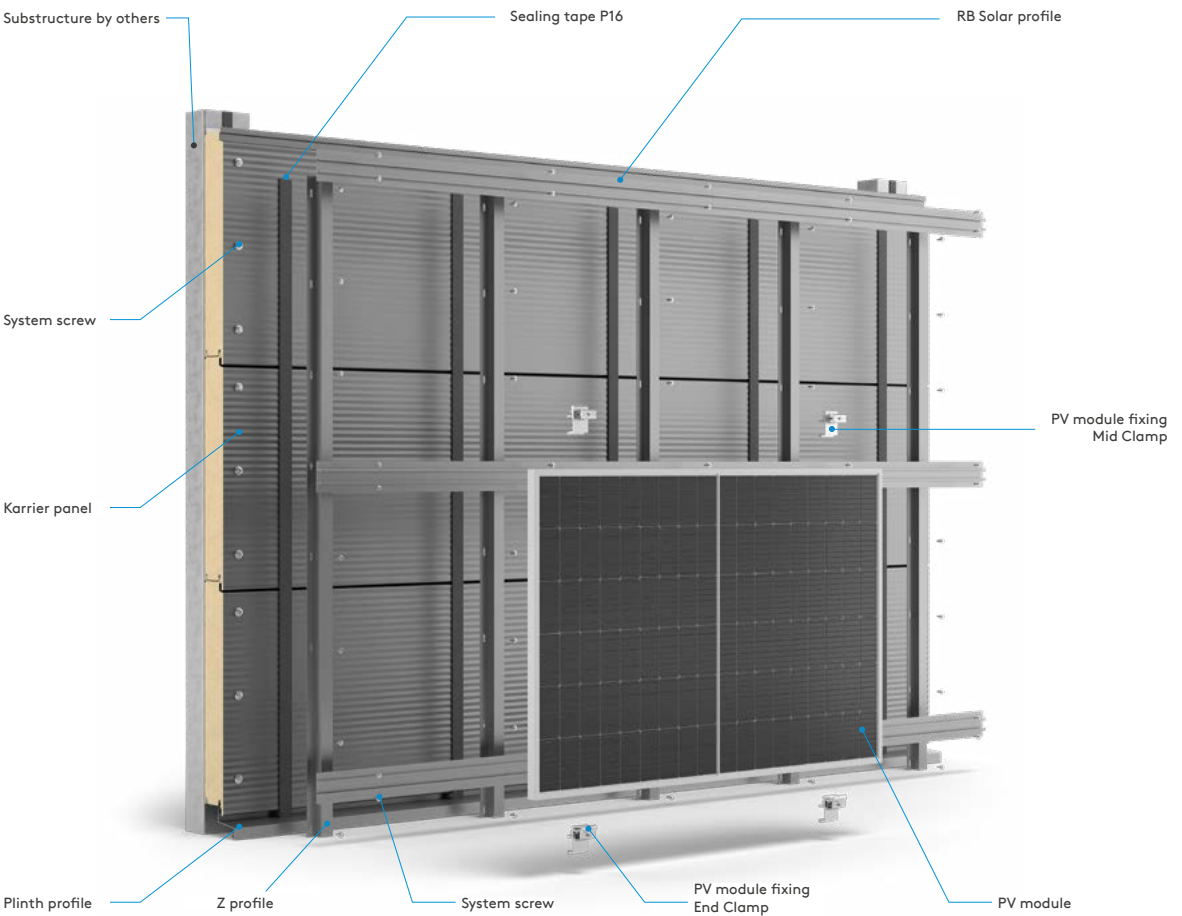
Wall sandwich panel specially designed and certified to carry loads from external façade cladding that provide a structural load-bearing capacity of up to 40 kg/m².

Assembly components

The system assembly components are the profiles attached to the Karrier panel, the horizontal profiles for mounting the PV module mounting clamps and the mid and end clamps for fixing on the extreme edges of the module.

PV module

Recommended photovoltaic module with up to 21.7% energy efficiency.



In Kingspan range you will find a large selection of Karrier panels dedicated to bearing the load of external cladding, as well as various types of photovoltaic modules.

Karrier System

Karrier is a modern architectural facade system with a QuadCore®, IPN and K-Roc® insulation core, based on a sandwich panel specially designed and certified to transfer loads from the external facade cladding. A wide range of external cladding from leading manufacturers can be attached to Karrier panels. Karrier system allows you to build a weatherproof building envelope in a much shorter time compared to other to alternative systems regardless of weather conditions.

Product highlight

- Can successfully replace traditional external wall and/or ventilated façade
- Simple and easy to assemble - can be quickly and efficiently installed in almost all weather conditions
- Can be installed vertically and horizontally
- System has excellent thermal and sound insulation properties as well as fire performance
- Can be installed with almost any type of external cladding solution available on the market including: prefabricated aluminium cassettes Dri-Design, HPL, ACM, Fibercement, Ceramic or expanded Mesh
- Karrier panels are available in three options:
 - Karrier QuadCore® - with a QuadCore® foam core
 - Karrier IPN - with IPN foam core
 - Karrier K-Roc® - with a K-Roc® mineral wool core

Dimensions

	Panel thickness (mm)	Panel lenght (mm)	Panel width (mm)
Karrier B	60, 80, 100, 120, 150, 170	500 - 13 000	1000
Karrier BK	80, 100, 120, 150, 170	550 - 15000	1000
Karrier BK QuadCore®	80, 100, 120, 150, 170	550 - 15000	1000
Karrier KL	100, 120, 150, 170, 200	550 - 15000	1000 1150
Karrier KL QuadCore®	100, 120, 150, 170, 200	550 - 15000	1000 1150
Karrier KT K-Roc®	80, 100, 120, 150, 175, 200, 220, 240	550 - 14300	1000 1150 1200



Physical properties

Weight (for panel width of 1000 mm):

- 11.79 - 29,55 kg/m² (depending on panel thickness)

Materials:

- external steel sheet thickness: 0.60 mm
- internal steel sheet thickness: 0.40 or 0.50 mm (depending on the variant and core)
- insulation core

Other steel sheet thicknesses are also available on request.

Mechanical Parameters:

The Karrier system comes in three insulating cores:

- IPN
- QuadCore®
- K-Roc®

The standard finish of the external galvanized steel sheet is PES25 (polyester SP25) with a thickness of 25 microns.

The standard finish for the internal galvanized steel sheet, a PEI15 (polyester SP15) coating with a thickness of 15 microns is used.

Karrier panels can also be finished with a higher standard of coatings depending on individual needs.

What is the QuadCore® core?

QuadCore® is a closed-cell hybrid insulation with distinct, gray microcells. Its structure has been precisely developed by Kingspan R&D Department, thanks to which it allows to achieve very low values of λ (thermal conductivity). This, in turn, translates into exceptional thermal insulation performance with thinner panels.

The insulation material does not contain any harmful red list chemicals, has a low global warming potential (GWP), and does not contain CFCs (chlorofluorocarbons) or HCFCs (hydrochlorofluorocarbons).

What is the IPN core?

The IPN insulation core is a rigid polyisocyanurate foam core that features excellent thermal insulation performance and proven low U-values.

What is the K-Roc® core?

The K-Roc® insulating core is a mineral wool core that is characterized by very good fire parameters and thermal insulation properties, as well as excellent acoustic insulation.

Installation

Assembly can only be started after appropriate measurements and checking the position of the structure.

Exact place of mounting the Z03 starting profiles should be marked on the structure.

Z03 starting profiles should be attached to the lower horizontal element of the supporting frame using self-drilling screws. **Remember:** Z03 profile is the first support for Karrier panels and must be leveled very carefully during installation.

The maximum distance between the Z03 starting profile and the end of the facade panel is 150 mm. **Remember:** Z03 profiles are not intended to support the Karrier panel against long-term loads and should not absorb vertical loads after the panels are installed.

The lower drip-flashing should be attached to the Z03 starting profile at the heigh indicated in the project.

Place Karrier panel in the appropriate position on the Z03 starting profile and then attach it to the supporting frame with self-drilling screws. **Remember:** number of the screws should always be confirmed with the Kingspan Technical Department, because in addition to the loads acting on the Karrier board, they must also take the weight of the cladding.

The Karrier panel is installed with screws through and through (through the entire thickness of the board) placed evenly along the width of the panel. **Remember:** only screws with vulcanized EPDM washers should be used.

The another Karrier panel should be installed above the previously installed panel.

During installation, the position of the panels should be verified using a spirit level.

After installing the Karrier panels on the wall, you can start installing the system substructure made of Kingspan Omega/Z profiles. **Remember:** Kingspan Omega/Z profiles are an integral part of the Karrier system.

Attach the Kingspan Z profiles to the Karrier panels using system fasteners. **Remember:** installation should be carried out using JF3-2-5.5x25 + E16 fasteners, mounted at a spacing of 242 mm in the factory predrilled holes.

Detailed installation instructions for the Karrier system can be found in the brochure called "PowerWall Installation Guide".

Certification and Testing

Fire reaction class:

The Karrier system panels with the IPN and QuadCore® core have a fire reaction class of B-s1, d0 in accordance with the EN13501-1 standard.

The Karrier system panels with a K-Roc® core have a fire reaction class of A2-s1, d0 in accordance with the EN13501-1 standard.

For Karrier systems, we have the German Technical Assessment - DIBt (German Institute of Building Technology) and KOT (National Technical Assessment).

High performance photovoltaic modules are used around the world. They can be installed on rooftops, walls or in other locations where they have access to sunlight.

Photovoltaic Modules

High-quality PV modules continue to bring benefits to local economies and customers of “higher performance, lower level of degradation and greater dependability”.

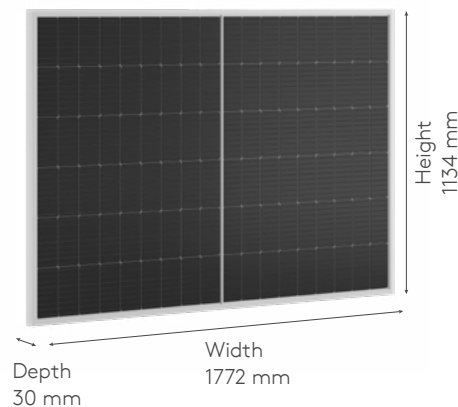


Product highlight

- Half-cell lower operating temperature
- Poweroutput from 220 W/m²
- More than 22% efficiency
- More than 80% of poweroutput after 30 years
- Less than 1,5% powerdegradation in first year
- Easy to install
- Impact and scratch resistance
- Resistant to temperature, wind gusts and hail
- No breaking away from the wall during a fire
- Fire rating: IEC class C

Photovoltaic Modules Technical Information

Dimensions



Physical properties

Weight:

- 22.5 kg

Materials:

- Dual glass, 2.0+1.6 mm heat strengthened glass
- Anodized aluminium alloy frame

Mechanical Parameters:

- Junction box: IP68, tree diodes
- Output cable: 4 mm², MC4

Operating Parameters

- Operational Temperature: -40°C ~ +85°C
- Power Output Tolerance : 0 ~ 3%
- Voc and Isc Tolerance: ±3%
- Maximum System Voltage: DC1500V (IEC)
- Maximum Series Fuse Rating: 30A
- Nominal Operating Cell Temperature: 45±2°C

Mechanical Lading

- Front Side Maximum Static Lading: 540 Pa
- Rear Side Maximum Static Lading: 240 Pa
- Hailstone Test: 25 mm Hailstone at the speed of 23 m/s

Temperature Ratings (STC)

- Temperture Coefficient of Isc: +0.050%/°C
- Temperture Coefficient of Voc: +0.230%/°C
- Temperture Coefficient of Pmax: +0.290%/°C

Installation

The installation of photovoltaic modules requires professional skills and knowledge and must be carried out by qualified personnel. Installation personnel must be familiar with the mechanical and electrical requirements of this system.

PV modules shall be installed on suitable buildings or other suitable locations (such as the ground, garage, building exterior, roof, PV tracking system), but not on vehicles.

PV modules shall be installed in the working environment with the temperature of -40°C to 40°C , which is the average monthly maximum and minimum temperature of the installation sites. The extreme temperature for modules is -40°C to 85°C. Ensure that the installed modules are not subjected to wind or snow pressure that exceeds the maximum allowable load.

Provide lightning protection for modules installed in locations subject to frequent lightning and thunder.

Do not install panels in locations where flammable gases may be present.

Do not use the modules in environments with excessive hail, snow, smoke, air pollution and soot, or in places with highly corrosive substances such as salt, salt mist, salt brine, active chemical vapour, acid rain or other substances that corrode the modules and affect the safety or performance of the modules.

Certification and Testing

Protection Class: Class II

Fire Rating: IEC Class C

Kingspan PowerWall Karrier is a new product and will undergo a series of testing and certifications. Please consult our team or your local Kingspan representative regarding the latest testing and accreditation the product has achieved.



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