

Solar PV Systems

Flat roof solutions



Photo Credit: Ivegat Ltd

A photograph of a green roof installation. In the foreground, there are various green plants, including a tall stalk with yellow flowers on the left and several purple flowers in the center. The background shows a large array of blue solar panels installed on a flat roof. The sky is blue with some light clouds.

**Noah's Ark Children's Hospice
Barnet**

BUILDING BOARD

Roof Size:	5,100m ²
Roof Systems:	BauderSOLAR G LIGHT with extensive green roof Bauder Total Green Roof System
Specifier:	Squire and Partners
Approved Contractor:	Voland Roofing Limited
Green Roof Contractor:	Bridgeman & Bridgeman
PV Installer:	Joju Solar

Bauder is a leading European manufacturer of flat roof waterproofing membranes and insulation to make buildings watertight and thermally efficient; photovoltaic systems for renewable energy generation; green roofs to support the environment and create better living and working spaces for people; and blue roofs for stormwater attenuation and prevention of localised flooding.

Customers choose us because of the way in which we do business, for our robust advice on the right system, and our approach to delivering projects. We work alongside clients to deliver the best solution for a building from our broad portfolio of systems.

Solar PV

Photovoltaic systems for flat, green, and blue roof applications

Our photovoltaic solutions are innovative, penetration-free, quick to install, and provide a cost effective and highly efficient solution.

Our solar photovoltaic (PV) systems are designed to ensure the Bauder waterproofing beneath remains completely intact and without compromise.

The entire installation process of both of our photovoltaic systems is quick and simple. Through our portfolio, we guarantee the entire Bauder specified roof package rather than a separate element, giving single source point of contact and responsibility to reduce risk.

Specifying a solar PV array

A flat roof is the ideal place for a solar photovoltaic installation to generate site-sourced electricity. Renewable energy generation has a big role to play in the delivery of a net zero carbon building and integrating renewables allows it to meet a proportion of its own energy needs, minimise carbon emissions, and reduce building running costs.

Outline of our solar PV systems

- Two systems for new build and refurbishment projects, BauderSOLAR and BauderSOLAR G LIGHT.
- Penetration-free installation of mounting system to reduce risk.
- Variety of solar PV modules to suit client needs and budget.
- Range of Bauder waterproofing options.
- Comprehensive range of guarantee packages to suit project requirements.

Achieving technical objectives

- Bauder solar PV array designs meet MCS PV Guide requirements and IET Codes of Practice.
- System designs comply with:
 - BSEN 62446 Grid Connected Photovoltaics
 - BSEN 61853-1 Defining Solar Photovoltaic Power
 - BSEN 1991-1-4 Wind Actions on Structures
 - BRE Digest DG 489 rev 2014



BauderSOLAR PV Solutions

Two systems for creating a rooftop solar PV installation

Integrated photovoltaic solutions for flat roofs on both new build construction and retrofit for current buildings.

Through our systems we guarantee the entire roof package for single source point of contact and responsibility to reduce risk.

BauderSOLAR F and BauderSOLAR F XL

Flat roof photovoltaic mounting system that is attached to the roof without penetration of the waterproofing system or roof deck. The systems are designed to be used in conjunction with our single ply or bituminous membrane waterproofing solutions and are lightweight at 9-12.5kg/m², depending on the module selected.

As module manufacturers strive to increase the efficiency of solar modules, the industry is moving to larger format cells and module structures.

BauderSOLAR F XL System allows the installation of larger format modules ensuring we can provide our clients with the most efficient solar solutions for their flat roof projects. BauderSOLAR F fits modules up to 1060mm wide to embrace the refurbishment sector where an existing PV array is being replaced.

BauderSOLAR G LIGHT

Our biosolar photovoltaic solution that integrates a Bauder green or blue roof where the substrate and vegetation provide the ballast to secure the array. This system allows for the entire roof area to qualify as a green roof, and if a biodiversity vegetation finish is specified, this can help the building achieve Urban Greening Factor, Biodiversity Net Gain, and BREEAM ecology credits whilst simultaneously maximising solar generation.



BauderSOLAR PV Design Fundamentals

Brief outline of some key considerations

Solar PV is a popular and mature renewable energy technology, and its deployment is rising due to the combined importance of achieving net zero and reducing energy costs.

With recent fluctuations in energy markets and carbon reductions initiatives coming to the fore, the number of solar PV installations on flat roofs will continue to rise as local authorities and businesses look to reduce their carbon footprint and gain energy security for the future.

Sizing of Solar PV systems

The size of the solar PV array will be determined by the overall aim of the scheme, the building's energy consumption, available non-shaded roof space, and client's budget.

On new build developments, the size of the array will usually be determined by either Part L requirements or local planning conditions. This can lead to complications if the size of the output required is not applied to the available roof space to ensure that the system will physically fit on the roof whilst also considering safe access, shading, and fire breaks between the array and other roof items.

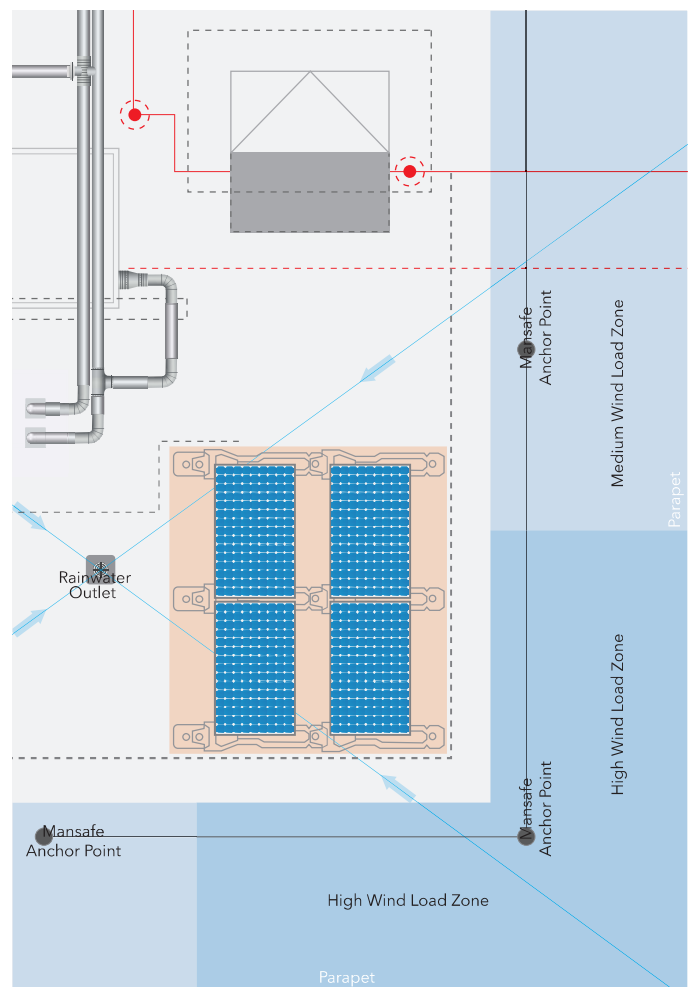
Our photovoltaic solutions are designed for the maximum number of modules to be installed on the identified roof area maximising energy generation from the roof.

Retrofitting PV

Retrofitting photovoltaic panels is possible on many existing buildings and the primary considerations are the additional weight loading, wind uplift factors that the PV array will impose, and what the impact of a retrofitted solar array may have on existing roof warranties.

Durability of the waterproofing system is also a key consideration as its remaining lifespan should, at a minimum, match that of the PV scheme, as well as be able to withstand any additional access requirements for maintenance.

The most popular system installed as a retrofit on refurbishment projects is the BauderSOLAR F system.



BauderSOLAR F and BauderSOLAR F XL Systems

Flat roof PV solutions for new build and retrofit projects

The mounting system is secured to the roof using membrane-to-membrane welding techniques on our bituminous and single ply waterproofing systems.

Our BauderSOLAR PV systems deliver technically advanced solutions through design of the mounting system and efficiency of the solar PV modules for both new build and retrofit projects.

The distinctive element of our lightweight PV mounting system is the prefabricated Bauder membrane sleeves which slip over the mounting plates and are welded into position, anchoring the plates to the surface of the Bauder waterproofing system. Once this is completed, the rest of the solar PV installation is simply locked into place without any requirement for tools or sharp fixings.

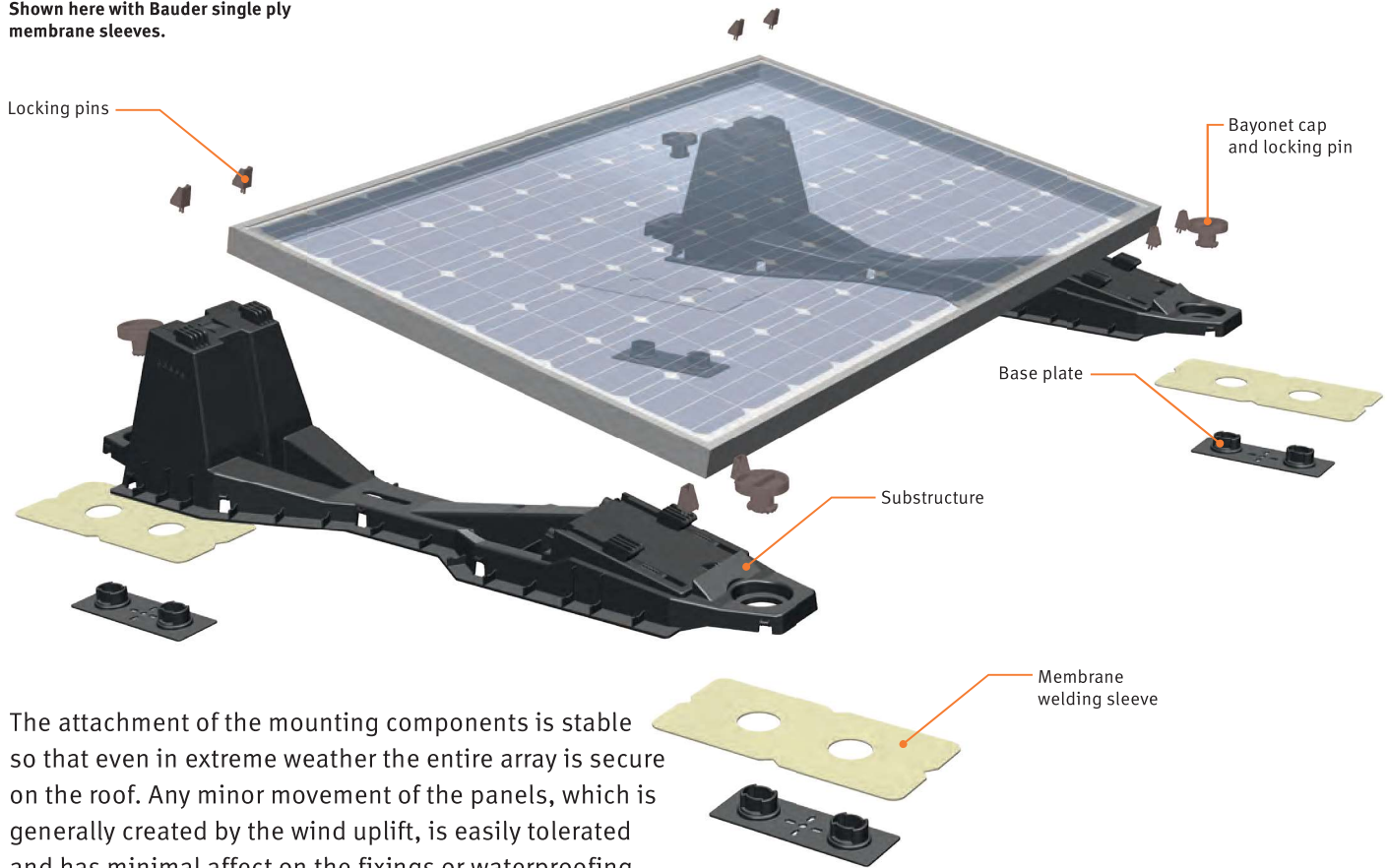
Plus points

- Penetration and ballast free installation method reduces risk.
- High output to roof space ratio.
- Range of solar PV panels to suit client needs and budget.
- Lightweight system 9-12.5kg/m², depending on the module selected.
- Single source for design of waterproofing and solar PV array with clear accountability.
- Comprehensive range of guarantee packages to fulfil cover requirements for the project (dependant on system/product selection). For more information contact our technical dept for a sample guarantee outlining cover level, terms and conditions.



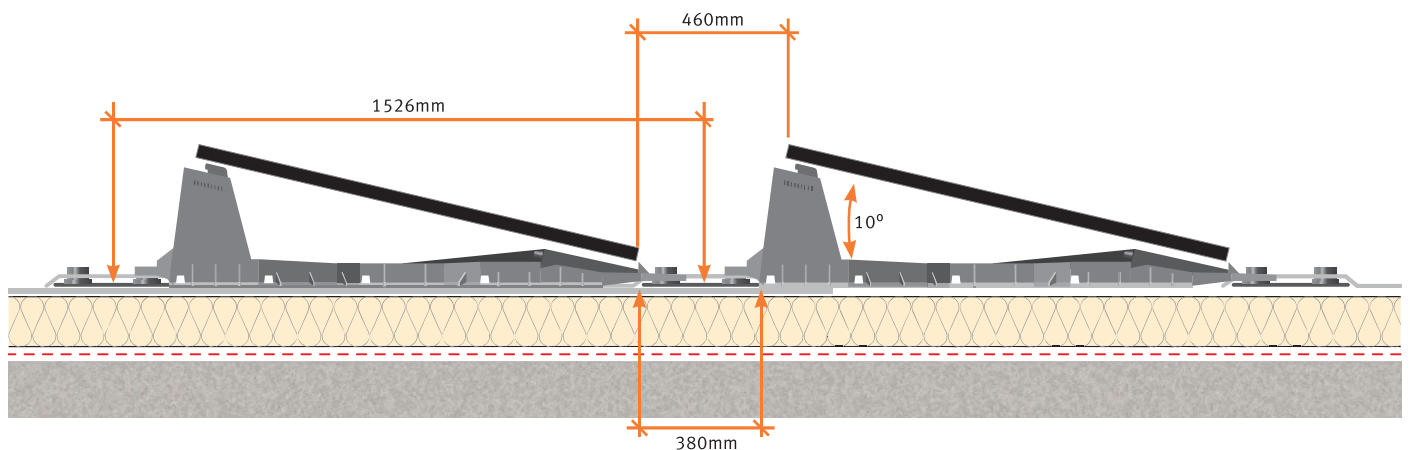
BauderSOLAR F and BauderSOLAR F XL Systems

Shown here with Bauder single ply membrane sleeves.



The attachment of the mounting components is stable so that even in extreme weather the entire array is secure on the roof. Any minor movement of the panels, which is generally created by the wind uplift, is easily tolerated and has minimal affect on the fixings or waterproofing system.

Dimensions shown are for BauderSOLAR F XL mounting system.



BauderSOLAR G LIGHT System

Biosolar PV solution for green roofs with substrate based biodiverse and extensive vegetation

This is a unified solution for mounting solar PV arrays where the substrate and biodiverse vegetation provide the ballast to secure the array for new build and retrofit projects.

BauderSOLAR G LIGHT system brings together net zero and environmental advantages to allow the entire roof area to qualify as a biodiverse green roof to meet planning, biodiversity net gain, and BREEAM requirements. Additionally, the biosolar system can increase the efficiency of the array because the vegetation preserves ambient rooftop temperatures, helping to keep solar modules closer to optimal output.

Supporting flora and fauna

The panels create a mixture of sunny, shaded, and sheltered zones to give a matrix of different habitats for a broader range of vegetation whilst also providing refuge areas for small invertebrates from inclement weather.

Undulations in the substrate can be created to further enhance the diversity of flowering plants that then provides a rich foraging environment for bees and insects.

The substrate can be vegetated in several ways or combinations of planting schemes can be specified to create a variety of finishes. The BauderFLORA 3 seed mix is a specific blend of low growing and shade tolerant native plants; plug plants can be used where specific species are required; and vegetation blankets provide instant coverage between the panels and stabilisation of the substrate in exposed locations.

Plus points

- Raised modules allow light and moisture under the panels and the creation of a variety of habitats supporting a greater range of plant species and small invertebrates.
- Single point responsibility for the waterproofing, green roof and PV installation.
- Comprehensive range of guarantee packages to fulfil cover requirements for the project (dependant on system/product selection). For more information contact our technical dept for a sample guarantee outlining cover level, terms and conditions.

