


PEG[®]

Revolutionizing PV Mounting

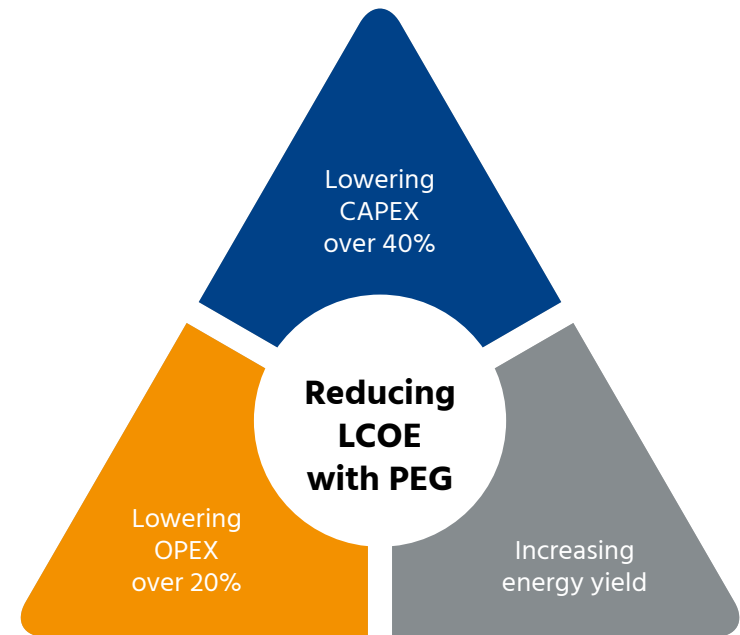


Reaching the lowest cost of electricity with
simplified, rapid deployment, high-density mounting

The PEG Effect: Save CAPEX and OPEX

For many years solar photovoltaics has been defined by its typical **Engineering-Procurement-Construction (EPC)** process. Today, Jurchen Technology is challenging this old-fashioned principle with **Engineering-Procurement-Installation (EPI)** – a new PV power realization process focused on quick and resource-saving installation.

PEG system was formed with a simple goal in mind: create a power unit to deliver electricity at lowest possible levelized costs of energy (LCOE), with best in class technologies, long-term reliability and large volume scalability. The PEG unit significantly reduces both substructure supply and delivery, as well as installation costs.



PEG CAPEX savings:





Lower CAPEX

With PEG's simplified system design there are no reasons for months of planning, a time consuming consulting and expensive construction tasks.

PEG works nearly without ground soiling foundations. No heavy construction machines are needed. Components are partly shipped pre-configured in container-based units.

Lower OPEX

Due to new working ergonomics and an above ground installed DC cabling maintenance costs can be reduced by a quarter.

PEG reference site in Haidt, Germany



A rod, which changes everything.

The new system design is based on a PV module mesh, which is borne by many rods. The whole logistic and realization process changes.



PEG[®] vs. common PV Plants

Comparison of:	Traditional Solar Power Plant	PEG Power Plant
Area utilization	Medium, cause system-related free space between straight PV module lines	PV module mesh with highest area utilization
Raw materials	High amount of steel, wood and concrete	No concrete, no wood; saving up to 65% steel
Project process	EPC: Engineering, Procurement, Construction over several months	EPI: Quick Engineering, Procurement and Installation over a few weeks
Engineering	Predominant individual process	3D scan-assisted planning with standardized PEG clusters; customer choice: Manufacturer of PV modules and inverter system
Procurement and logistics	Individual planning and components » complex transportation planning, customer duties and logistic efforts	Easy material flow, transport planning and logistic process by container-based units
Installation	Heavy machinery and many workmen with different skills with driving licenses needed; Construction works partly overhead (substructure, PV mounting)	Simplified process with small teams; nailing and mounting with hand tools; Besides AC/DC configuration no special skills needed; no heavy machines; no overhead working; no cable trenching
Operation & Maintenance	Overhead working, difficult tests with underground cabling	All component are installed over-ground with working height around one meter
Energy yield	Peak power generation at noon time	Balanced power generation with better energy yield at sunrise and sunset due to east/west exposition



No complex substructure



No heavy machines



It's not EPC, it is EPI

(Engineering-Planning-Installation)

The PEG power plant will be installed rather than constructed. It is based on an innovative system design, which follows the ground surface - the PEG mesh. The ground-nailed substructure clamps the PV panels at about one meter elevation over-ground. The specially engineered construction design with its flat 'zigzag' pattern is very durable against environmental impacts. Furthermore at high wind

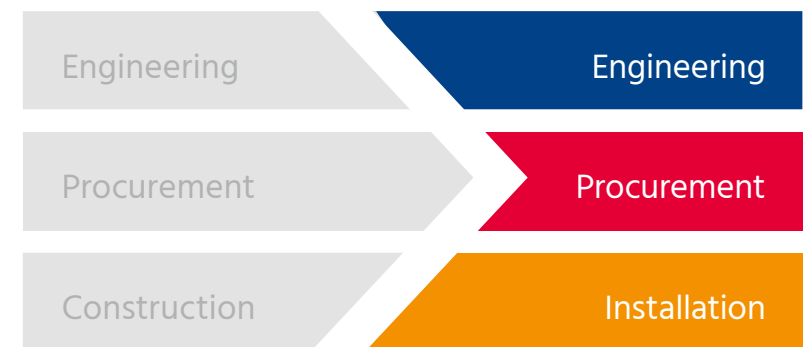
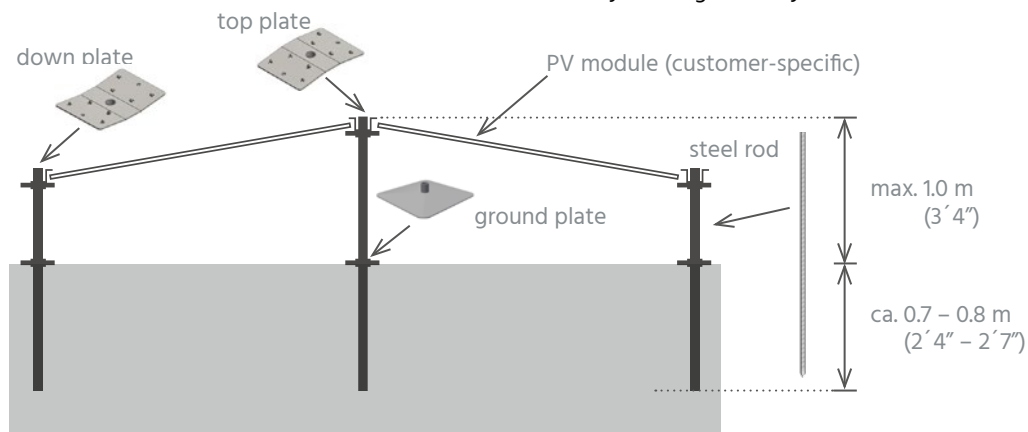
loads the patented construction produces a down-lift, which increases the static characteristics.

The PEG System is a revolution in the field of substructures for PV power plants with framed modules. It is a unique solution and especially designed for **east/west exposition**.

The PEG system significantly reduces both

substructure supply and delivery as well as installation costs. Due to the lightweight construction no foundation is needed. Less material and a simple design lead to reduced labor costs and the phase between planning and commissioning is reduced significantly.

The PEG substructure is the lightest, most efficient and innovative system on the market. Substructures of our competitors are much heavier and more expensive. Most of them need concrete foundations and heavy machines. With PEG, the steel rods of the PEG substructure can also be installed with only a hammer drill.



PEG[®] Engineering

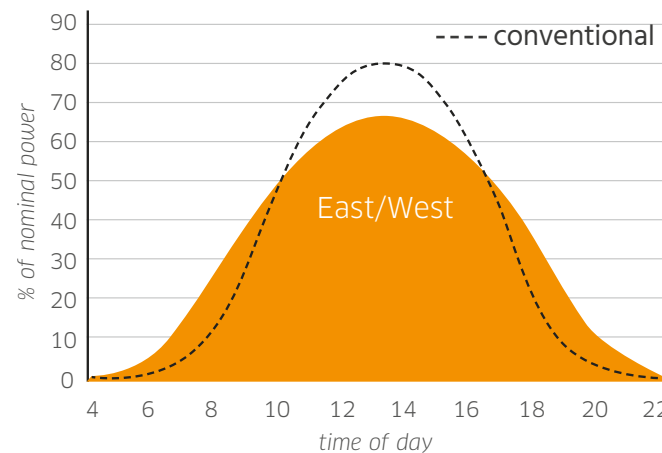
With PEG the engineering process has been enormously simplified. Cause substructure is based on a rod-mounted PV mesh, it's easy to plan a PV plant on a selected client surface. The ground leveling and the alignment of the PEG blocks are assisted by 3D scan and CAD engineering.

Clustering PEG power blocks

The whole engineering process has been simplified by a clear standardization with PEG system blocks. Related to PV panel type and the selected level of DC system voltage (1000 to 1,500 V_{DC}) PEG engineering process works with pre-defined power blocks.

In contrast to conventional PV module lines, the PEG mesh utilizes a greater power-generating photovoltaic area. The flat - typical east-west oriented - PV generator creates a smoother daily averaged electricity yield. Grid-connection points are less stressed and feed-in power peaks are more reduced.

Consistent energy generation across the day:



PEG engineering benefits:

- Fully scalable system design
- High location variety: Like a millipede, numerous mounting poles will be adapted to the ground and establish a new freedom of site selection
- Suitable for many PV module types
- Freely adaptable for 1,000-1,500 V_{DC}
- Most effective land utilization for utility-scale photovoltaics
- Low visual and ecological impact
 - ▶ simplified approval procedures



Self stabilizing



Low visual impact



Wind-proofed *

* Designed for 2,400 Pa module pressure load;
Max. wind speed is 135 mph (60.3 m/s)

Most effective land utilization.

Low visual impact.

Full scalable from 10 kWp to MWs.



The revolution in utility-scale PV power: Best-in-class area utilization of 1.85 MWp* per hectare (0.75 MWp* per acre)

* Figures refer to 550W modules and may differ regionally.

Reduced raw materials.
No concrete foundations.
Unit-based packaging.
No construction vehicles.



-50%
logistic
costs

A dark blue rectangular box containing the text '-50% logistic costs' and two rows of white truck icons. The top row has five truck icons, and the bottom row has five truck icons, for a total of ten icons representing a 50% reduction in logistic costs.

PEG[®] Procurement

Never again dealing with heavy loads and on-site problems with impassable terrain; never again dealing with complex customs clearance. Besides its simplified engineering and installation work-flow PEG system has one more ace up in sleeve: The consumption of raw materials and production resources is enormously lower compared to traditional solar PV projects.

All that even goes so far that you can install the whole DC-related PEG power plant with a small team equipped with some hand tools.

PEG material procurement and project logistics. In short, four maritime containers are sufficient to transport a PEG power plant with one megawatt DC capacity.

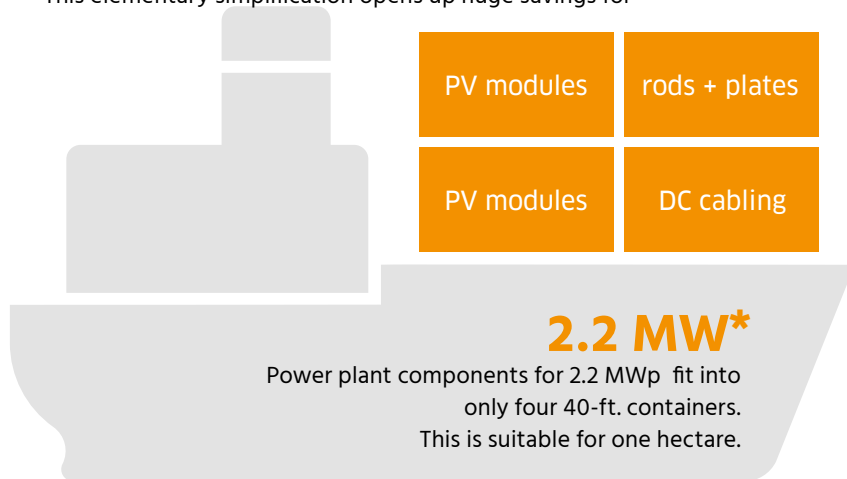
PEG's revolutionary system design enables transportation to far reaches all over the world. Thus not only on-grid capacities but also off-grid systems can produce eco-friendly, decentralized electricity.



PEG procurement benefits:

- Minimal material and transport cost
- Significantly reduced steel consumption
- Eliminates need for concrete foundations

This elementary simplification opens up huge savings for

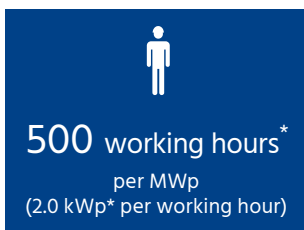


* Figures refer to 550W modules and may differ regionally.

PEG[®] Installation

The PEG power plant installation is based on a quick nailing process. Only four workmen are necessary to start-up a PEG power plant installation. Like an ink-based office printer is completing a print out, the PEG power plant will be installed line-by-line. In contrast to traditional PV power plant suppliers the working process does not depend on heavy working machines or vehicles. Most works can be run at waist level to ensure an ergonomic and HSE optimized working environment.

Despite the high-level of standardization the PEG system design is compatible to many PV panel manufacturers. For best individualism the customer can choose his favored panel type.

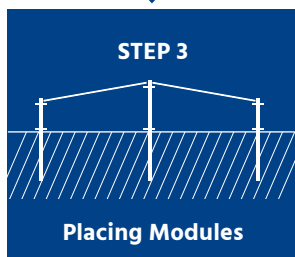
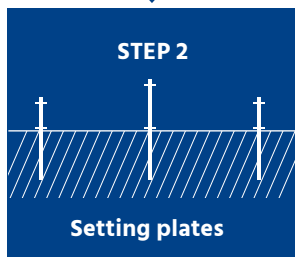
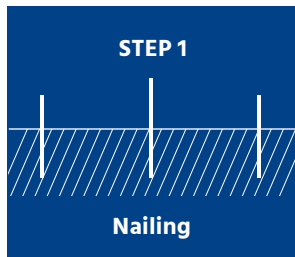


Easy and fast installation with PEG:

- Installation speed: 500 working-hours* per MWp
- Simple installation process:
 - no need for special construction requirements and heavy machinery
 - no concrete foundations
 - no cable trenches
- Reduced risks and cost in terms of HSE
- All components installed over-ground (no underground works necessary)
- Ergonomic working height: 0.6 m to 1.2 m (2 to 4 feet)
- PEG will be installed line by line with an easy nailing placement process
- Simple and residue-free dismantling after project life, in case of different land use designation

No heavy machines.
No concrete foundations.
Simpler HSE procedures
on project site.

3 STEPS TO PEG:



Operation and Maintenance

O&M services help to support continuous PV plant operation, giving higher energy yield and therefore high return on investment across life-cycle. From daily operation, routine and scheduled maintenance, to outage services the service team meets the demands of customers' individual operational and maintenance models comprising as risk sharing mechanisms.

- Maintenance
- Spare parts and obsolescence management
- Warranty extensions

While developing the new PEG system our engineers considering the longtime experience in the operation and maintenance of large-scale PV power plants. In result PEG's low substructure with overground DC cabling allows a simplified site inspection.

Besides, Jurchen Technology introduces a new, smart O&M work-flow, especially a robot-assisted PV module cleaning process, a mowing robot and an O&M service bench to access single PV modules on-site.



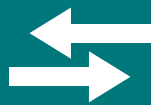
Quick and easy site inspections:

- Low substructure allows easy site inspections
- No parts installed under ground
- Quick and easy full-string check ups
- PV module servicing with PEG working bench

PV site care

- Robot-assisted PV module cleaning
- Robot-assisted turf mowing (in normal case not necessary with PEG)





Easy module replacement



Mowing robot



Fast + effective cleaning

O&M solutions
especially for PEG.

Easy to use and efficient.



For module replacement TÜV certified **MULTIBOARD** is the perfect solution to walk over the module rows.



RAYMO TORPEDO ROBOT
+ R42 FLEX CUTTING DECK

The mower includes an all-wheel drive and is available in both a hybrid version and a purely electric version.
Mowing performance on a PEG plant:
2ha (5 acres) per day

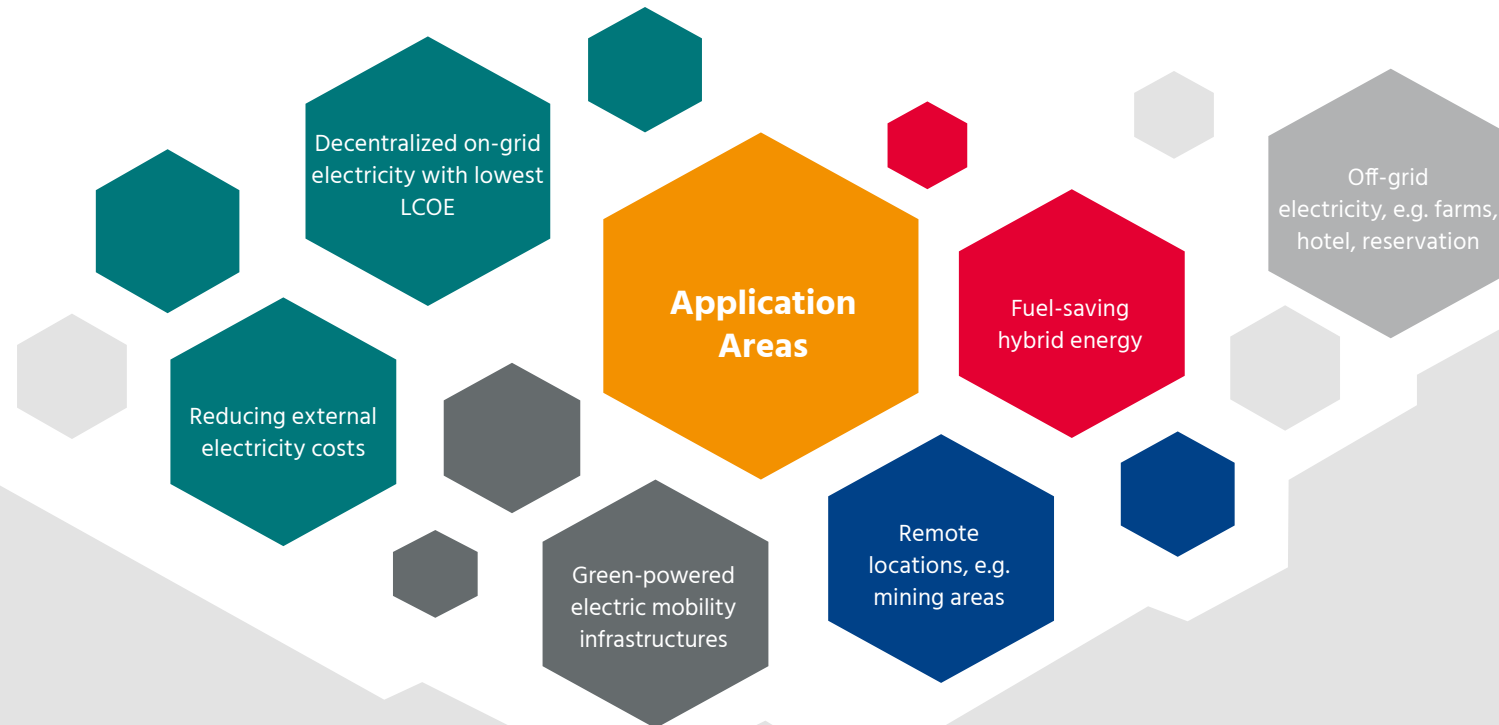


The **GAL-IN SOLUTION** is specifically designed for the PEG design (V-shape) and works very efficient.

PEG[®] placement options

PEG PV plants are feasible in nearly every environment where affordable electricity is needed. Our engineers had tuned all components to operate under desert-proofed conditions as well as under Nordic climates. With it's easy to transport units and weights PEG systems can be delivered to very remote locations. The high level of standardization makes it possible to place a PEG power block to a variety of ground surfaces. This freedom in the choice of location and PEG's optional battery and hybrid control extensions are enabling new business models for our customers.

How can PEG optimize your business?





Free scalable and application-oriented PEG placements

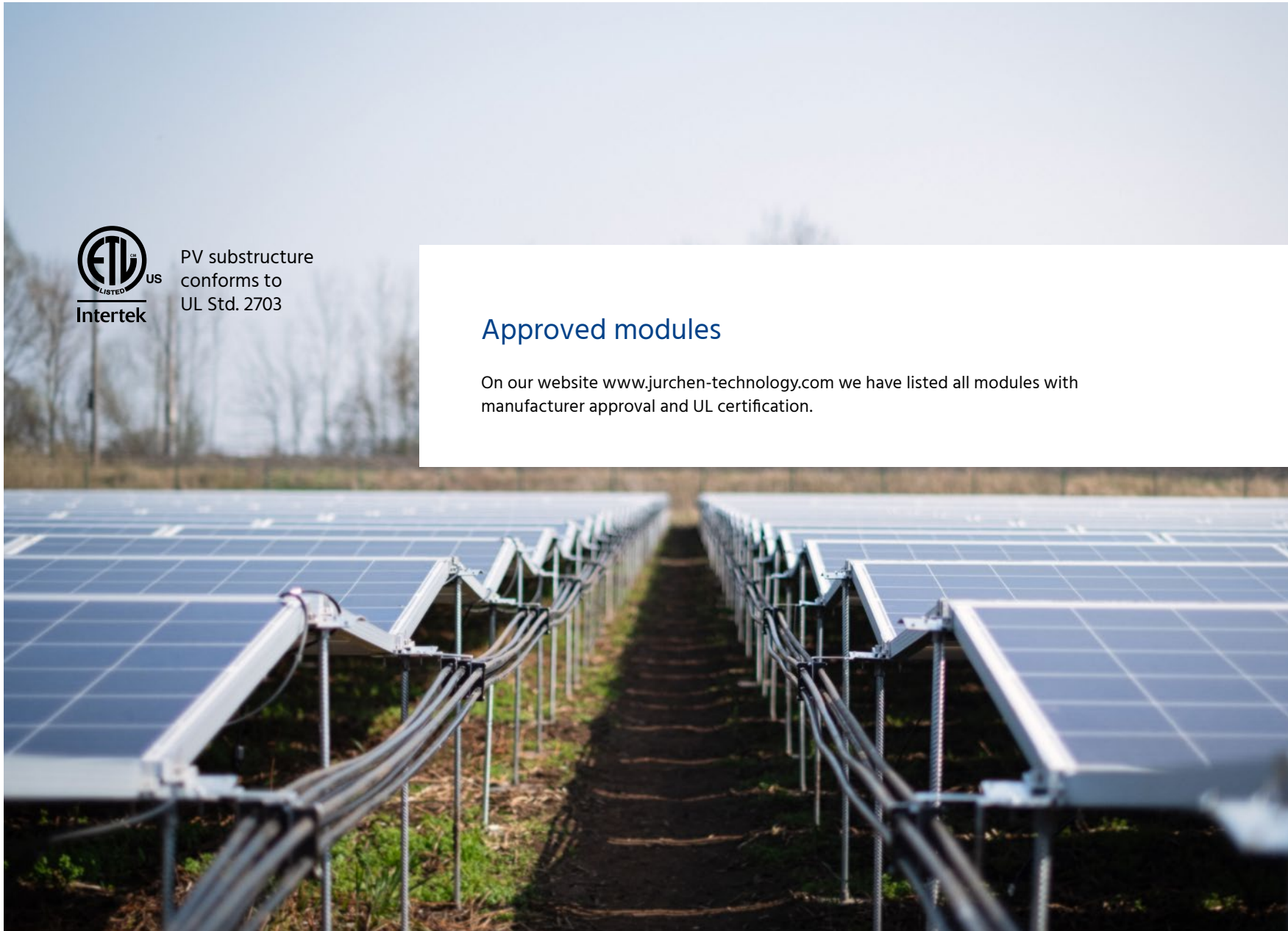




PV substructure
conforms to
UL Std. 2703

Approved modules

On our website www.jurchen-technology.com we have listed all modules with manufacturer approval and UL certification.



Specifications and approvals

Technical data	
Orientation PV array	Patented 8° East-West, fixed tilt, aerodynamic proofed (patent-registered design)
BOM (Bill of material)	1.10 rods and 2.15 clips per module
Large volume scalability	Any power plant capacity from at 10 kWp is possible
Durability	Hot deep galvanized steel rods and pre-galvanized steel plates. PV modules and clips based on corrosion-free aluminum and glass. All DC cabling components are weatherproof and UV resistant.
Wind loads	Designed for 2,400Pa module pressure load; compliance with wind codes is TBD by local engineering company per wind region
Valid air temperature	Up to 50°C, 122°F (up to 55°C, 131°F with Hot Climate Option)
Certifications	Clamping approval from module manufacturers. Wind load certificate by local engineering firm in accordance with local wind codes. The PEG substructure is UL certified.

Requirements	
Land soil condition	Cohesive (e.g. sandy-clay, clayey silt) and non-cohesive soil (e.g. sand or sand-gravel).
Upper soil layer	No rocks or underground infrastructure up to 1m (3' 4") below ground; rammed depth up to 0.8m (2' 7")
Site slopes	The PEG system can be installed on slopes of up to 4.5 deg. In case the slope is up to 2 deg, the rods should be vertical to the horizontal plane. In case the slope is higher than 2 deg, the rods should be vertical to ground slope.



PEG[®] – The revolution in the field of PV substructures

Jurchen Technology GmbH
Prinz-Ludwig-Straße 5
97264 Helmstadt, Germany

phone: +49 (0) 9369 98229 6600

fax: +49 (0) 9369 98229 6699

E-Mail: info@jurchen-technology.com

www.jurchen-technology.com

Best in class DC cabling and revolutionary PV substructures

Jurchen Technology specializes in the development and production both the substructure and the appropriate high-quality DC cabling for solar systems from the rooftop to the solar park.

We are the only provider on the market to offer a dual and innovative component solution for solar plants. In its production of all components, Jurchen Technology attaches special importance to the quality of the materials and workmanship and the long-lasting reliability of the products. This allows us to implement an extremely wide range of customer requirements, individually and optimally.

The Jurchen Technology Expert Team supports customer projects from the planning and construction to system approval and operation. Technicians with many years of experience in the field of solar energy work out the structural engineering planning and cost-efficient cabling solutions.

Jurchen Technology delivers the system components directly to the building site and provides support for the construction work and system approval if required. Even afterwards, the personal contact from Jurchen Technology is always available for his customers.

Jurchen Technology has its headquarters in Bavaria, Helmstadt and production locations in India.

