

Mounting solutions for photovoltaic systems

Secure your investment in renewable energies



From visions to solutions

Mounting



Renusol GmbH – The innovative company with sunny visions

Young, dynamic, innovative. Since 1997, we have been specialising in well thought-out solutions for the installation of photovoltaic systems. Using our in-depth experience, we develop, produce, and sell modular systems for the safe mounting of solar installations both ground mounted and on all types of roofs. As a 100% subsidiary of CENTROSOLAR Group AG, we have been optimally supplementing the overall portfolio of this supplier of complete photovoltaic systems since 2005 and are represented in all core markets in Europe and America with our systems and supplementary services.

From visions to solutions

systems measured by excellence

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Renusol – Your partner for an alliance with development potential

Milestones of the company's history

- 1997 Established as Econergy GmbH
- 2004 Company name changed to Ubbink Econergy Solar GmbH
- 2005 Integration into the Centrosolar Group
- 2009 Company name changed to Renusol GmbH
- 2009 Foundation Renusol SARL France
- 2010 Foundation Renusol America Inc. in Atlanta
- 2011 Foundation Renusol Italia SRL

Important market introductions of mounting systems

- 1998 ConSole (flat roof solution)
- 2003 InterSole (BIPV system)
- 2006 VarioSole (universal solution for pitched roofs)
- 2009 IntraSole (BIPV system)
- 2010 MetaSole (universal solution for metal roofs)
- 2011 ConSole+ (aerodynamic flat roof solution)
- 2012 Further development MetaSole

Renusol mounting systems – many advantages for trade and industry

- Solid, durable and well-proven PV mounting systems
- Easy planning of installations
- Pre-assembled components
- Short installation times
- Optimised packaging sizes
- More than 1,000 items in stock and directly available for delivery
- Building permits in the respective countries
- Close collaboration with country-specific decision makers for feed-in remuneration
- Approved quality, TÜV-certified, ISO 9001 certification is in preparation.
- 10 years product warranty
- Made in Germany



Flat-roof & Ground mounting

ConSole

Fast, simple, cost-effective. For mounting on flat roofs and ground areas

If you are looking for the optimal solution for medium to large sized PV systems on flat surfaces, this system will convince you. The unique mark of the ConSole is the use of ballasting through the weight of gravel, quarry tiles or similar material, so that the roofing or the underground remain intact. This results in very easy planning, extremely short mounting times, and secure support.

ConSole is made of 100% chlorine-free polyethylene, which gives the robust system longevity. At the same time, the slight weight and the stackable shape offer great advantages for logistics and warehousing and during installation.

ConSole is stable and durable and stands out through especially easy handling.



ConSole+

**Newly developed mounting system for
flatroofs with low load-bearing capacity**

The aerodynamic design of the ConSole+ leads
to significant reduction in ballast

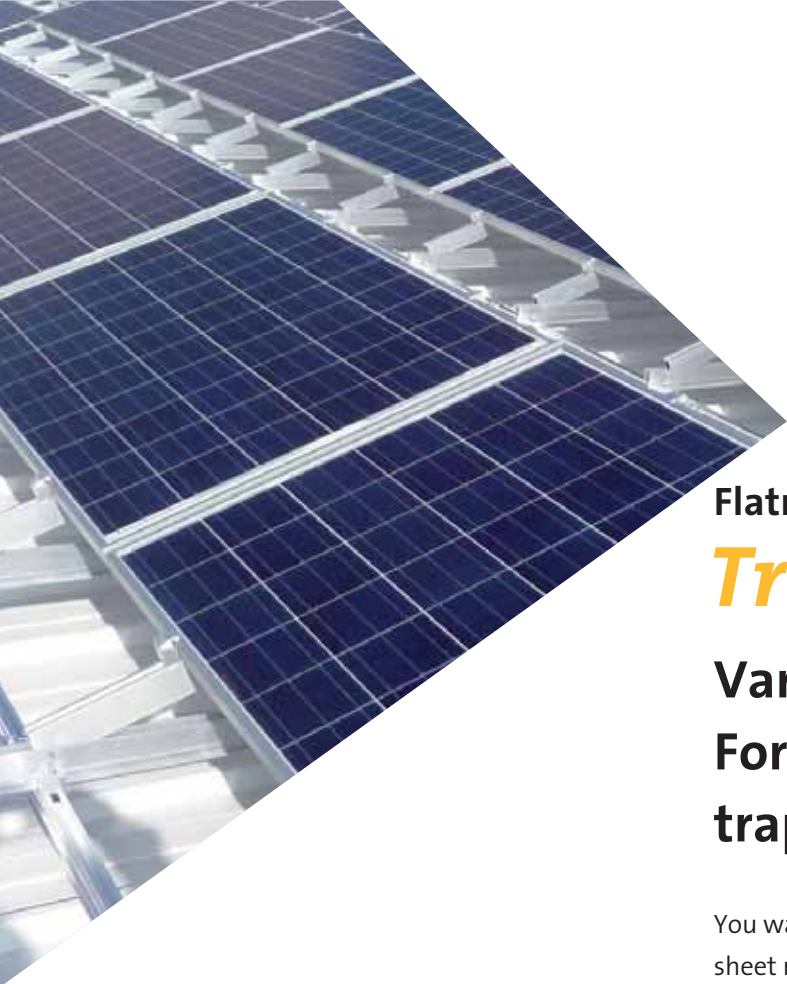
From visions to solutions



ConSole at a glance

- Flat-roof mounting, without anchoring, without damaging the roofing
- Also suitable for ground mounted installations
Especially for landfills, rocky undergrounds and conversion sites
- Available for most sizes of solar modules
- Support angles of 25° and 15°
- Aerodynamic version (ConSole+) support angle at 15° with wind deflector
- Free positioning of the modules
- Optimal load distribution without concentrated loads
- Complies with fire prevention measures according to DIN 4102, class B2
- Low product weight, depending on type between 5.0 and 7.2 kg
- Optimised packing units for trade and industry (up to 80 pieces per pallet)
- PV-plant design over the Renusol Web Configurator





Flatroof & pitched roof

TriSole

**Variable, free-standing, economical.
For mounting on corrugated or
trapezoidal sheet metal roofs**

You want to install a solar plant on a corrugated or trapezoidal sheet metal construction, possibly even using oversized, framed PV modules? If so, this system is particularly well suited because the triangular elevated mounting system of the TriSole can be easily mounted on flat and pitched roofs with inclinations of up to 20° quickly and securely using heavy duty panels, hanger bolts or solar fasteners.

Many system components are already pre-assembled, so that time-consuming and expensive preparations are no longer necessary. Durable components made of high-grade aluminium and stainless steel furthermore guarantee a long lifetime.

TriSole combines great flexibility with a robust design, and stands for simple, fast and secure mounting.

TriSole at a glance

- Suited for almost all flat roof coverings, from sheeting to bitumen, trapezoidal and corrugated sheet metal, to fibre cement, standing seam, concrete or gravel.
- For flat / pitched roofs with inclinations of up to 20°
- For roof substructures of wood, steel and concrete
- Compatible with all current PV modules
- Especially suited for oversized PV modules
- Flexible installation on the roof with ballast, hanger bolts or solar fasteners
- Available with inclinations of 8°, 10-15°, 20-30° and 35-45°



Ground mounting **TerraSole**



Flexible, resistant, uncomplicated. For ground mounting

When planning PV systems on open terrain best trust in a perfected free-standing mounting system like TerraSole, which can be adapted highly flexibly to different local conditions. Because high loads through wind and snow, expensive anchoring in the ground and different table configurations present particular technical challenges.

TerraSole is suited for almost all standard PV modules as well as laminates and can be optimally adapted to the locality. All system components are made of weather-resistant materials that are easy to mount and at the same time guarantee a long useful life.

TerraSole moreover reliably and flexibly meets all requirements needed for a modern free-standing PV installation.



TerraSole at a glance

- Harmonious plant design thanks to variable inclination and height
- Stable through strong and durable materials
- Individual adjustment depending on module size and local conditions
- Customisation possible
- Fast and easy installation of the mounting system
- Dimensioning done by experienced application technicians
- Standardised systems possible
- Components can be completely recycled when they are dismantled



Trapezoidal metal sheet mounting

MetaSole

Light, small, versatile. For mounting on pitched roofs with trapezoidal metal sheet roofing



If you want to install a PV system on a pitched roof with trapezoidal metal sheet construction and at the same time prefer a simple installation and optimal cost-performance ratio, MetaSole offers you the perfect solution.

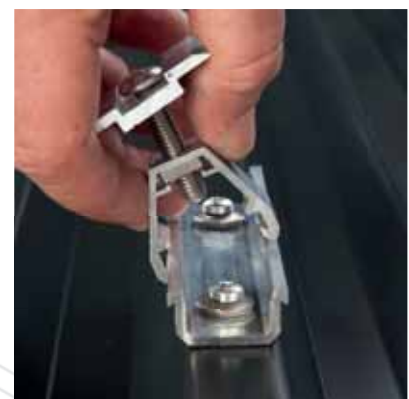
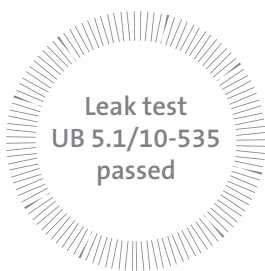
The compact system makes the fast mounting of framed PV modules on trapezoidal sheet metal roofs between 0.4 mm and 1.5 mm thickness possible. Only four different components are required for the direct installation of the modules: a clamp base with optimised weight, two thin sheet metal screws with special coating, one end clamp, and one middle clamp. The screw with a crowding tip makes pilot drilling unnecessary, which results in extremely short mounting times. The smaller volume, the lapse of rails, fewer components and the reduction ... to the absolute minimum result in very low investment costs.

MetaSole makes affordable and fast logistics, cost-effective warehousing, and easy mounting possible.

From visions to solutions



- Qualified PV Mounting System
- Periodic inspection



MetaSole at a glance

- For trapezoidal metal sheet roofs between 0.4 – 1.5 mm thick
- For trapezoidal metal sheet roofs made of aluminium and steel – **NEW**
- For standing seam roofs – **NEW** (aluminium, copper, zinc and stainless steel)
- Rainwater-proof through clamp bases with pre-assembled EPDM rubber
- Mounting without pilot drilling
- Mounting without drilling templates
- Suited for modules of all heights (construction height 30 to 50 mm)
- Only 4 mounting components, no rails
- Impermeability test UB 5.1/10-535 MFPA
- Building authority approval DIBt Z-14.4-627

With a mounting time of less than 10 minutes per kWp and a weight below 1.3 kg per kWp, MetaSole sets new standards for the installation of PV systems on trapezoidal metal sheet roofs made of steel and aluminium sheet



On-roof mounting
VarioSole

**Stable, universal, height-adjustable.
For PV-Mounting on all pitched
roofs**

VarioSole is a universal mounting system, regardless of the types of roofing and substructure of the pitched or mono-pitch roofs. It offers maximum flexibility and meets the worldwide varying requirements regarding construction history and country characteristics for mounting and fastening solar installations. VarioSole offers multiple opportunities for connecting PV modules to the roof and is thus a true universal solution, guaranteeing optimal utilisation of the roof area.

Due to its height-adjustable mounting elements, VarioSole is also suited for uneven roof areas. The largely pre-assembled components are installed as a rail system that is mounted on the rafters using special roof hooks. Usually, only a few tiles have to be removed in this process, effectively decreasing the work required.

VarioSole impresses through an attractive cost-benefit ratio and is especially reliable due to its component stability and versatility.



VarioSole at a glance


- PV mounting system for roofs with inclinations between 10° and 60°
- For framed modules and laminates
- Complete product range of mounting components for roofing types such as plain-tile or slate roofing or corrugated Eternit or trapezoidal sheets and other roofing types
- Optimal compensation for any unevenness of the roof
- PV-module mounting possible both vertically and horizontally
- Variable mounting system for module frame heights up to 50 mm.
- Available in black and silver
- A complete removal of the roof covering is not necessary

The chameleon of on-roof installation

VarioSole is characterised by its extremely high variability. Thanks to the special construction, it is compatible with most of the common roof coverings and roof structures worldwide.

- It works with many country-specific roof installations, such as in: Germany, Austria, Switzerland, United Kingdom, Italy, Spain, Greece, Benelux, Denmark, America ...
- For all roof substructures of wood, metal and concrete
- Compatible with a wide array of materials and shapes (from Frankfurt and plain tiles, to slate, Marsigliese, Romana, Portoghese, and Doppio Coppo, to standing seam and trapezoidal sheet metal)





Roof integration

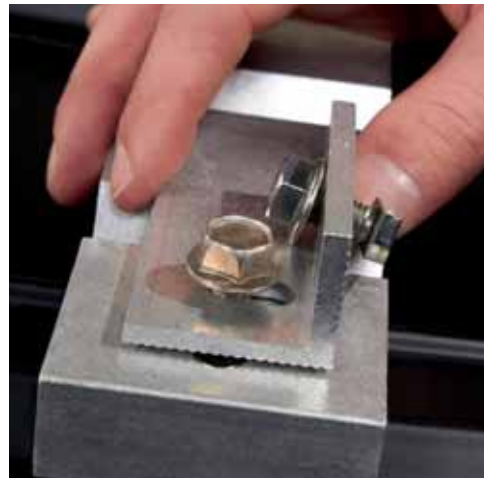
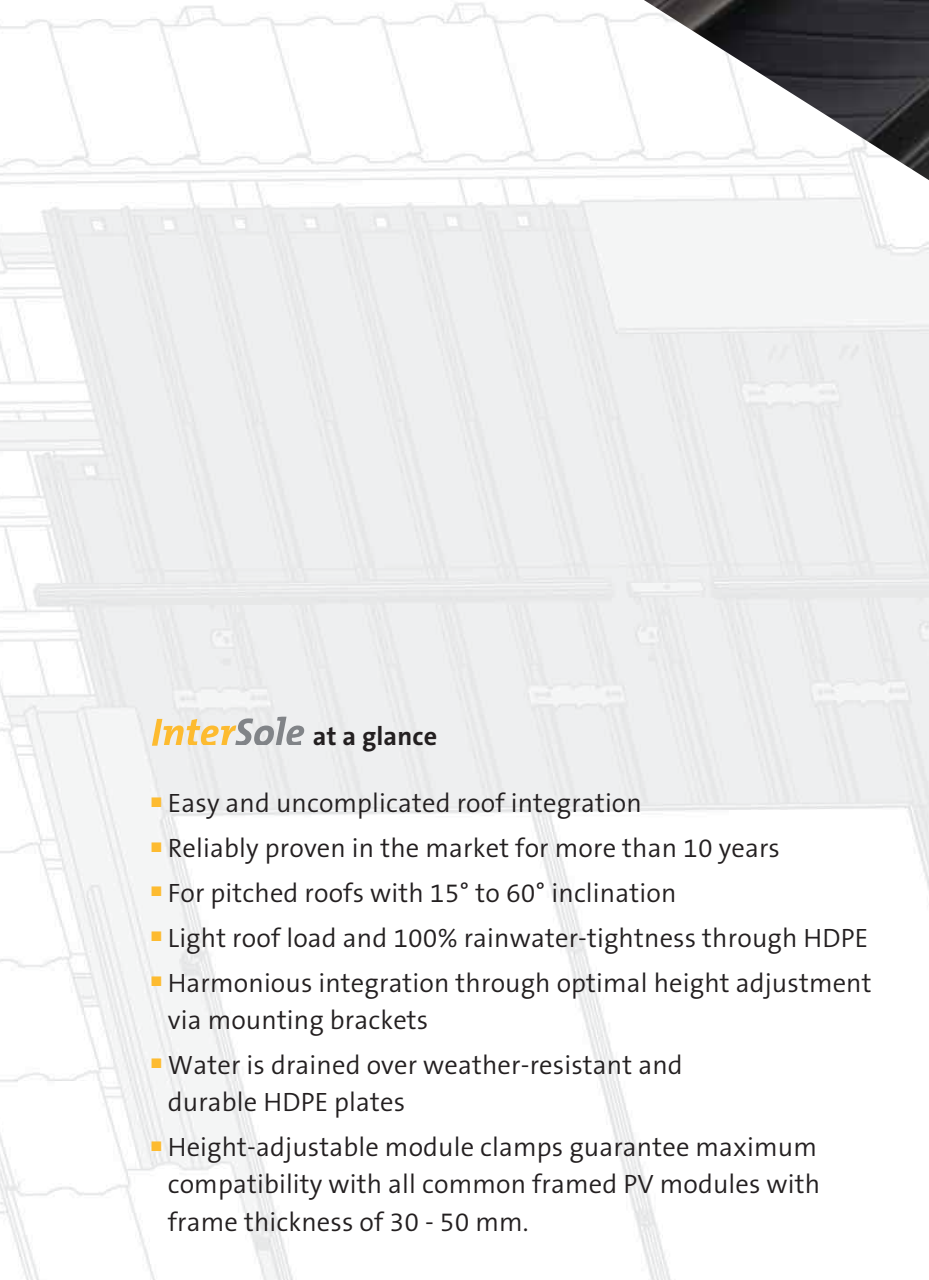
InterSole SE

**Variable, waterproof, reliable.
For in-roof mounting on all
pitched roofs**

In the area of in-roof mounting systems, InterSole offers an optimal alternative. It is one of the oldest and most reliable BIPV systems on the photovoltaic market. Since 2003, it has been ensuring rainwater-tight roofs with solar installations and thus highest customer satisfaction. The water tightness is guaranteed by the InterSole plates. The plates made of durable synthetics (HDPE) are hooked in the roof laths like gutter tiles. In this process, the anchors hold the mounting rails, on which the height-adjustable module clamps can hold nearly all marketable modules.

Thanks to the pleasant aesthetics, the easy installation and the high-quality materials, InterSole has proven its worth all over Europe over many years.

From visions to solutions



InterSole at a glance

- Easy and uncomplicated roof integration
- Reliably proven in the market for more than 10 years
- For pitched roofs with 15° to 60° inclination
- Light roof load and 100% rainwater-tightness through HDPE
- Harmonious integration through optimal height adjustment via mounting brackets
- Water is drained over weather-resistant and durable HDPE plates
- Height-adjustable module clamps guarantee maximum compatibility with all common framed PV modules with frame thickness of 30 - 50 mm.



Roof integration

IntraSole CL

Harmonious, flexible, elegant. For fully integrated mounting of PV laminates on pitched roofs

IntraSole CL is a mounting system with water drainage over the laminates, which is completely integrated in the roof. The system convinces through an optimal load distribution and its freely placeable mounting brackets and height-adjustable module clamps for mounting all current laminates.

At the same time, perfectly matched components ensure that no rainwater or condensed water can penetrate the roof.

IntraSole CL combines the best possible elegance and design harmony with a durable and stable installation.



IntraSole CL at a glance

- For pitched roofs with inclinations up to 60°
- Additional measures are required to make the roof 100% rainproof for inclinations between 14° and 23°
- Innovative BIPV system with water drainage over the laminates
- Integration of the laminates through individual height adjustment
- Compensating for height differences due to the construction is possible without problems
- Available in black and silver for a visually perfect integration
- Approval of 1st level GSE Title III in Italy granted



Our accessories – The perfect supplementation for a successful PV system installation.

With our well thought-out range of useful accessories, we optimally supplement our overall portfolio in the area of PV mounting. Our range of accessories is constantly being expanded and consistently continues our customer-oriented philosophy with the focus on convenience, speed, flexibility and highest quality.

Our accessories include for example:

- smart solutions for cable installation and routing
- useful end caps for mounting rails in different designs
- modern installation solutions for earthing, equipotential bonding and lightning protection
- protective anti-theft devices and measures for photovoltaic systems

Renusol – we are there for you

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From visions to solutions

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PV-design
now available
in PVscout



Web Configurator

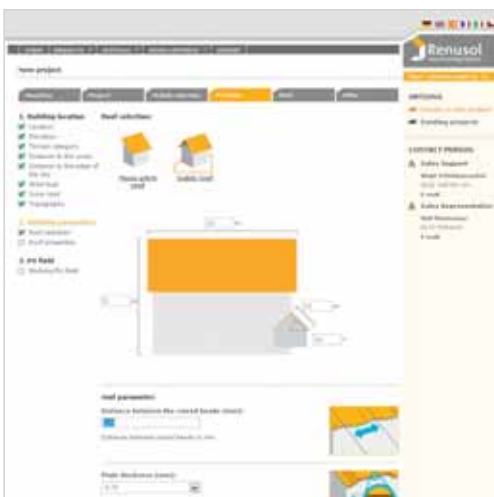
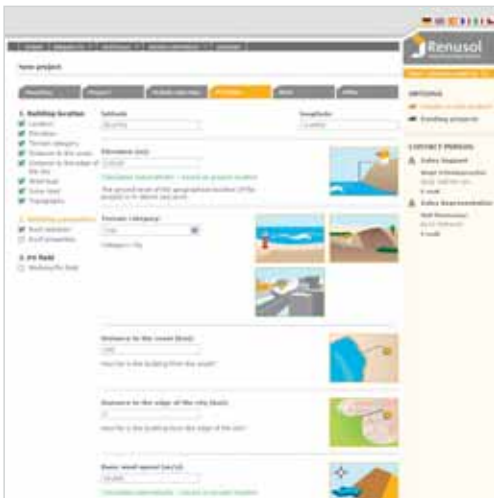
PV-planning tool, available 24/7 from everywhere.

The Renusol project configurator enables you to plan the entire Renusol mounting system matched to your photovoltaic system with just a few mouse clicks, if desired even with the calculation of the project-related statics. In this process, you can save your input in the configurator, and access your individual project data around the clock. This way you can create professional project templates and conveniently edit them at any time.

With this tool you can reliably plan and design your photovoltaic projects – clearly, easily and **of course free of charge!** You can access our web configurator here: <http://web.renusol.com>

The web configurator at a glance

- Available in 6 languages
- Static dimensioning possible worldwide (according to Eurocode)
- Automatic calculation of wind and snow load zones
- Individual building and roof parameters
- Graphic PV field planning
- Preparation of offers for customers, including detailed bill of material
- Automatic creation of a project report:
 - Graphic project documentation
 - Project overview, location data, roof parameters, module data
 - Positioning of individual mounting components
 - Bill of material
 - Graphic overview of the installation
 - Verifiable statics





Training & Courses

Practical advanced training by competent experts.

Take advantage of our professional training services for your own advanced training and that of your employees. What makes our training courses unique is that they take place under real mounting conditions directly at your construction site. This way, theoretical training becomes an effective experience and is a strain neither on the nerves nor the costs.

The practical training sessions take place worldwide in the language of the corresponding country or in English under the supervision of experienced application technicians with projects that are typical for the country. Until now, already several thousand participants have successfully gone through our training programmes, and to this day our training sessions are becoming ever more popular.

Of course we also offer training sessions in our training centre in Cologne. Just contact us!

Training & Courses at a glance:

- Experienced and certified trainers
- Very practical with hands-on mindset
- Training sessions in the country's language or in English
- Realisation directly at your location

In addition to teaching theoretical and practical knowledge, individual questions and real-life problems and solutions are being discussed.

We offer the following training courses:

PV-mounting on-roof systems

Mounting systems: VarioSole, MetaSole, ConSole, TriSole

Total time: 8 hours each

Number of participants: min. 5/max. 15

PV-mounting integrated systems/GIPV/BIPV

Mounting systems: InterSole SE, IntraSole CL

Total time: 8 hours each

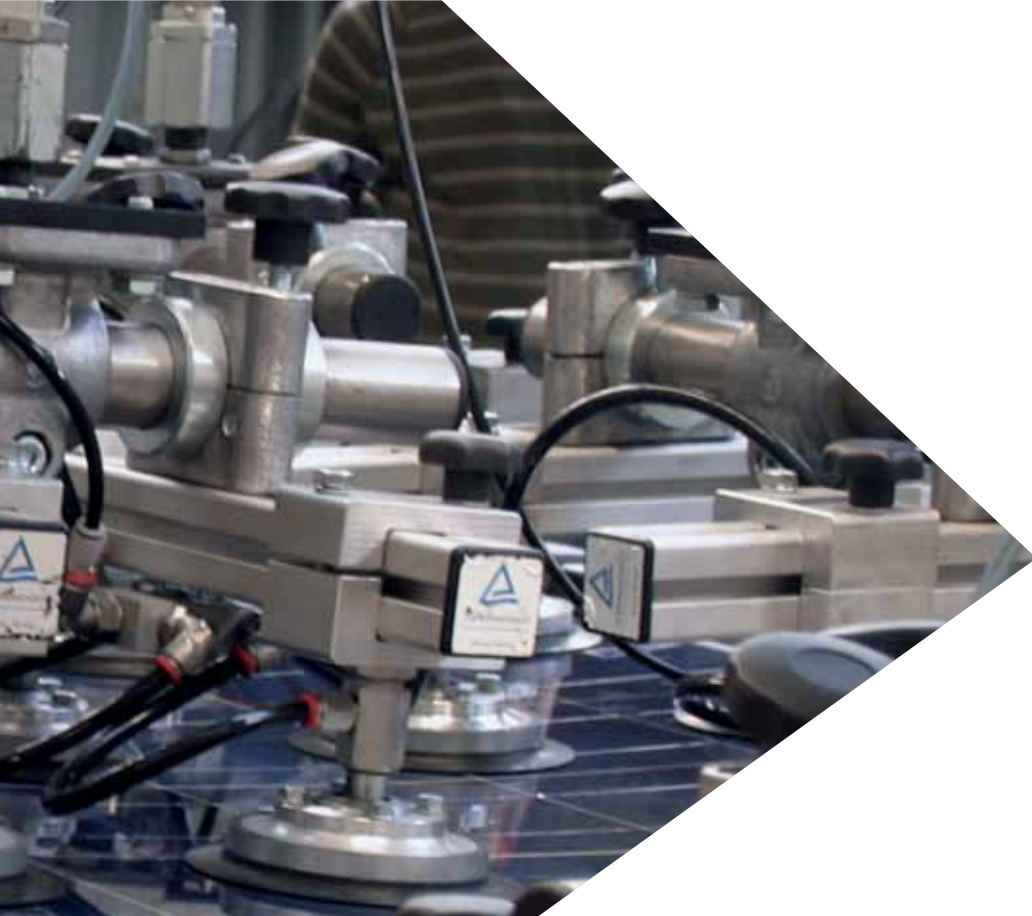
Number of participants: min. 5/max. 15

PV-ground mounting

Mounting systems: TerraSole, ConSole

Total time: 4 hours

Number of participants: min. 5/max. 15



Quality & Safety

Our products meet highest standards.

During the development of our mounting systems, we count on the most recent technical expertise, high-quality materials and extensive test procedures. On the road to marketability, we are supported by qualified cooperation partners such as TÜV Rheinland, LGA, MFPA or BDA, which conscientiously test and certify our innovations. In this process, we subject every product to elaborate test procedures prior to its market introduction. From extensive wind tunnel tests to the exact analysis of the water tightness under extreme conditions and the testing of the static calculations or an analysis of systems loads, we leave nothing to chance. Only this way can we guarantee the 100% safety of our products we require – made in Germany. Numerous given patents are a clear proof of our culture for innovation.



- Qualified PV Mounting System
- Periodic inspection



From visions to solutions

Service & Consultation

Take advantage of our many years of practical experience.

Please contact us if you have technical questions, need help with planning a project or have any other concerns. Our competent and flexible customer service team from the application technology department is happy to support you at any time and offers quick help and immediate solutions for any problem around the world.

- **Customer service**
- **Consultation for technical questions**
- **Project dimensioning and preparation of offers**
- **Preparation of drawings**
- **Creation of verifiable statics**
- **Training and courses**
- **Product sampling and construction site checks**



Logistics & Distribution

For a reliable start into successful PV projects.

The efficient organisation of our logistics guarantees you the timely and perfectly customised delivery of our mounting systems all across Europe. Due to the flexible structures within our production, we are able to react quickly even during peak times and ensure the optimal availability of all basic products.

Our individual packaging processes make it possible that for every order the goods are shipped as needed to the desired address. In addition, you benefit from affordable transport costs through the optimisation of our packing units. For example, 80 ConSoles fit on one pallet, which corresponds to an installation capacity of approximately 20 kWp. Another advantage for you is that we avoid unnecessary packaging material in general. This way, the recycling effort is reduced and the environment is protected in the best way possible at the same time.

- **Delivery of basic products within 48 hours**
- **Individual and project-specific customisation**
- **Environmentally-friendly packaging**
- **Optimal packing units**
- **Cost-efficient distribution planning**
- **Continuous optimisation of the logistics processes**



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