

Spelsberg präsentiert zertifizierte Klebepads als Erweiterung für PV-Anschlussdosen

Sichere Schnittstelle für PV-Module

Schalksmühle 13.04.2010. Auch in diesem Jahr ist die Günther Spelsberg GmbH + Co. KG auf der PHOTON Photovoltaic Technology Show vertreten. Vom 27. bis 29. April präsentiert das Unternehmen in Halle 6, Stand L34 interessierten Besuchern der Landesmesse Stuttgart sein umfassendes Leistungsspektrum bei PV-Anschlussystemen, das individuelle Lösungen, professionelle Beratung und Qualitätsprodukte für die Photovoltaikbranche umfasst.

Um wegweisende Lösungen wie innovative PV-Anschlussdosen, Steuergehäuse und Generator-Freischalt-Gehäuse bieten zu können, entwickelt Spelsberg Produkte am Puls der Zeit. Dabei haben die hohe Qualität und Langlebigkeit der Produkte höchste Priorität.

„Wir freuen uns deshalb besonders über die Erweiterung des TÜV-Zertifikats unserer PV-Anschlussdosen um die Befestigungsmöglichkeit mittels Klebepads.“, sagt Heiko Brüsewitz, Produktmanager bei Spelsberg. Die nach Solarmodulanschlussdosennorm DIN V VDE V 0126-5 geprüfte Montageform dient der Befestigung und Abdichtung der Anschlussdose. Sie ermöglicht eine schnelle, saubere, wirtschaftliche und wahlweise vollautomatische Applikation der Dosen bzw. der Pads in der Modulfertigung.

Die Günther Spelsberg GmbH + Co. KG präsentiert sich auf der PHOTON Photovoltaic Technology Show (Landesmesse Stuttgart) in Halle 6 Stand L34.

Weitere Informationen finden Sie unter www.els-solar.de oder unter www.spelsberg.de.

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Connecting
system for
photovoltaics

2009/2010



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Factory Buttstädt

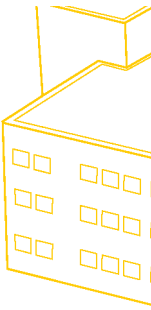
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Benefit
from energy

PV Connector systems

Made in Germany



For years now, the photovoltaic industry has been experiencing consistent growth. More and more people are recognising the advantages of this technology and more and more manufacturers are attempting to capitalise on its success.

Dear clients and associates,
Here you have our new photovoltaic catalogue, in which we proudly present what Spelsberg has to offer in this area. We are by no means newcomers to this field:
For more than 20 years, we have been applying our experience with enclosure technology to photovoltaic connectors.

What began in the 1980s as a specialised niche product has become one of the three pillars of our company. In order to keep abreast of the rapid growth of the renewable energy market, we founded an independent photovoltaic business division that occupies an equal position alongside our classic electrical installation technology and individual enclosure systems.

The result is the wide variety of products featured on the following pages. Producing energy from sunlight calls for premium quality products plus certification and long-term stability. Our know-how and our employees' expertise form the foundation of our capabilities in this area. Another factor in our success is our close collaboration with clients, leading to the ever increasing capabilities of our socket connector systems for photovoltaic modules. A diodeless socket connector recently developed by Spelsberg was distinguished with an award recognising innovation. Throughout all our success, we have remained a medium-sized family business – with a feeling of responsibility towards our municipality, employees, and above all, our clients, who we wish to help continue their activities in the market and achieve success. At Spelsberg, stock market fluctuations do not form the basis of our business decision-making – we and our family name stand for long-term partnership and dialogue, a close relationship with our clients and the highest quality. This creates a team atmosphere in which trust plays a large role, both internally and also in our relationships with clients and suppliers, and it is this trust that facilitates our innovations and services in an environment characterised by healthy growth. Demand the highest quality "Made in Germany", and see for yourself on the following pages, exactly what Spelsberg can contribute to your success.

Your General Management of Spelsberg



Over 20 years experience in the development and manufacture of PV connector systems



2009



For over 100 years our company has been well known in the housing and electrical goods industry. Competent development, quality manufacturing and reliable service are the qualities that our clients have come to expect and

appreciate from Spelsberg. During the 80s, through several oil crises and steadily growing popular environmental consciousness, solar energy increasingly became a topic of discussion. As photovoltaic systems were introduced on the market, Spelsberg was among the first

companies to become involved and was responsible for the development of specialised enclosures for modules. At that time, we were unique pioneers – since then, solar modules have made their way onto many roofs; the boom appears to continue and silicon,

the material from which the modules are produced, can hardly be produced rapidly enough to satisfy growing demand. Many companies are venturing into the PV market, however hardly any of them has as much experience as Spelsberg.



More than 100 years of installation and enclosure technology and over 20 years in photovoltaics have led to a wide, sophisticated product spectrum: "Made in Germany" brand quality – we develop and manufacture at both of our German locations.

We are of course also a partner of numerous trade associations within the solar industry.

The solar energy heartland of Erfurt/Thuringia



Since 1992, in addition to our main location in Schalksmühle, Spelsberg has operated a branch factory in Buttstädt, Thuringia, from which rapid delivery service to the eastern German states is guaranteed.

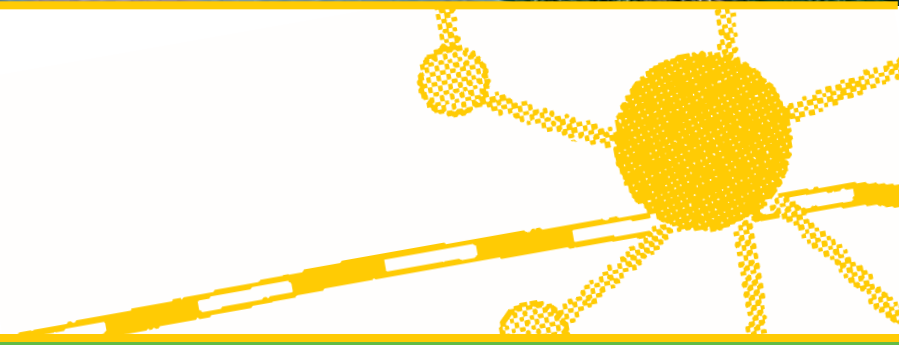
This location was not chosen by chance: alongside our own interest in the region the Thuringian state government has been endeavouring to develop the Erfurt-Jena-Ilmenau technology triangle as a stronghold of solar energy. We have more than achieved this goal:

The region today boasts a broad and diverse spectrum of middle-sized solar companies and research institutions. For example, the SolarZentrum of the CiS Institute for Microsensor Technology has for over 10 years been synonymous with expertise in silicon technologies and is

considered one of the industry's outstanding innovators. Our partnership with "SolarInput" forges a link between industry and research and enables us to develop joint concepts for industrial research projects.



In Buttstädt we are thus in the best of company; in order to be familiar with the latest developments, we are always able to find expert partners with which to collaborate in the immediate area.



Our Team



What would our products be, without the people behind them? Without the qualified employees who develop our products, manufacture and test them, and ensure the logistics runs smoothly.

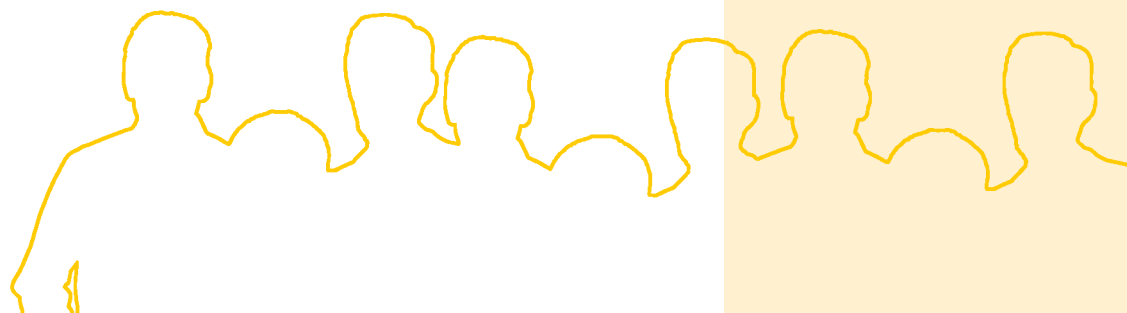
What would Spelsberg be without our sales and service team, who make direct contact with clients, and bring to life our philosophy of dialogue and partnership?

The people at Spelsberg influence the success of the whole company – but the really important thing is the success of the team.

This teamwork has resulted in a high level of commitment and long retention of employees at all levels.



Without the ideas and the motivation of the Spelsberg employees, we would not be where we are today.



Over 100 years of Spelsberg – top-ranking quality and innovative spirit



Over 150 000 enclosures leave the two manufacturing locations at Schalksmühle in North Rhine-Westphalia and Buttstädt in Thuringia daily, beginning their journey to clients.

A consistent organisational structure and the most modern logistics systems ensure that our products arrive punctually on-site, both at home and abroad. Spelsberg is represented by partners or subsidiaries in over 50 countries.

We absorb impulses from other markets through this international network, and are inspired by new technologies and the demands of clients from all over the world.

The results are continually improved brand products with certain extras – details that make their usage and maintenance particularly straightforward and safe.



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▶ **References (fr. l. to r.)**

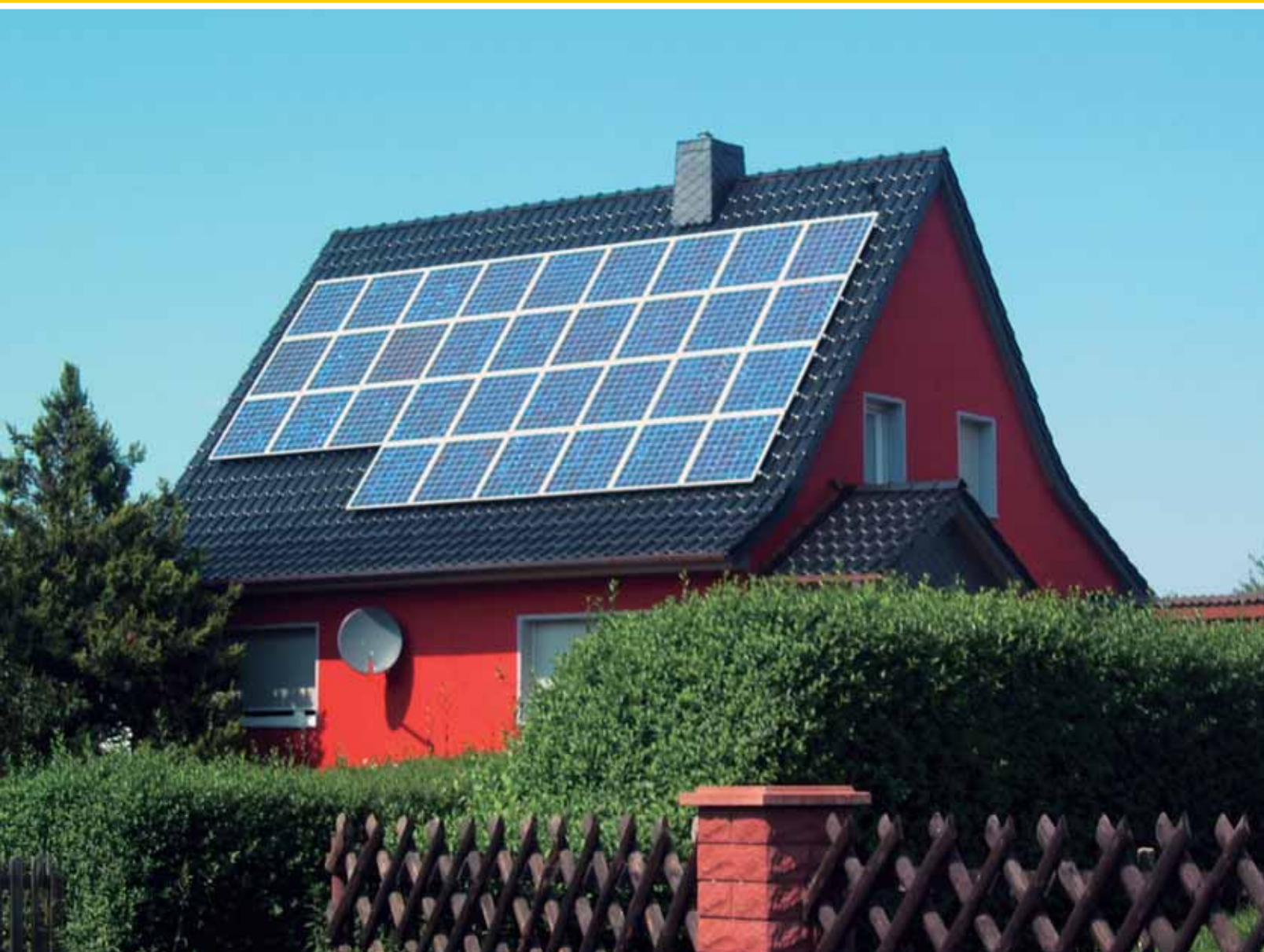
- Headquarters of German Railways
- Airport Düsseldorf
- Airport Frankfurt
- RWE Tower Dortmund
- Allianz Arena, München
- Railway Station Berlin



Our clients demonstrate their appreciation of our power of innovation, top-quality products and an attractive cost-benefit analysis through unprecedented brand loyalty.



Photovoltaics is the transformation of light into electrical energy



Why renewable energy?
Climate change demonstrates: Not only the limited availability of oil, natural gas and coal calls for a rethink, their environmental effects do so as well.

One approach to a solution lies in increased reliance on emission-free renewable energy sources. Photovoltaics, the harnessing of electrical energy from sunlight, is assuming an increasingly important role.

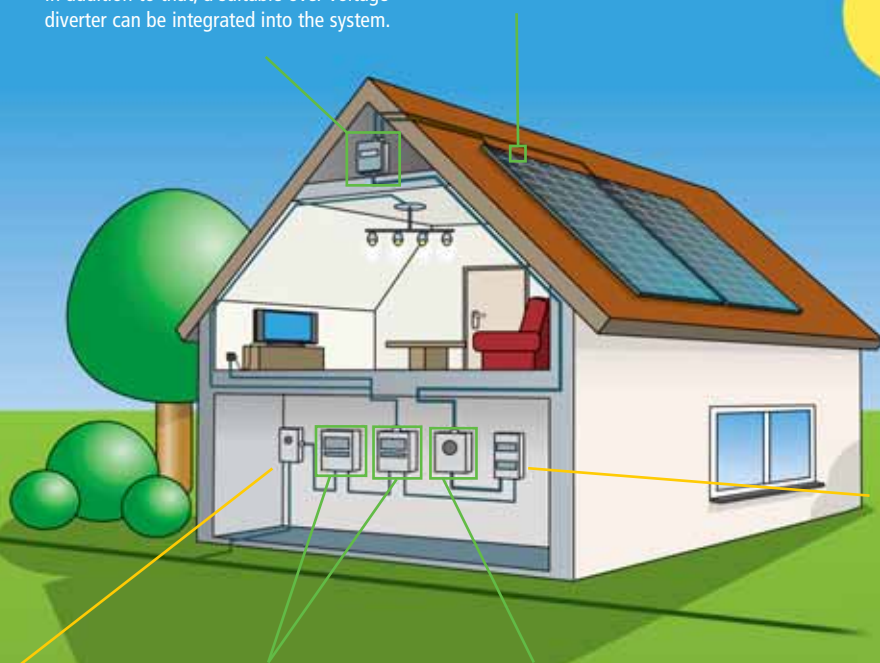
Exploit natural properties. Silicon, the element employed in solar cells, has four valence electrons orbiting the atomic nucleus.

Photons that impact the silicon as sunlight impart energy to these valence electrons, causing an electron to dissociate from the silicon atom, leaving behind a positively charged atom.

The complete electrical installation system using photovoltaic

If a PV terminal block housing is used (a so-called PV collector), several lines are brought together, usually in parallel. In addition to that, a suitable over-voltage diverter can be integrated into the system.

The PV generator consists of several PV modules connected in series and/or in parallel.



The feed into the public electricity grid is made through the grid connection.

The meter determines the supplied power and can therefore be used for settlement with the electricity supply company.

Interrupt generator enclosures ensure that the system is non-operational for the shortest possible time during necessary maintenance and repair procedures, and also, that components that are not undergoing repair can continue to conduct electricity!.

PV inverter convert the direct current (DC) into alternating current (AC) and match the frequency and voltage to the AC grid. For the low-power range up to 5 kW a string rectifier is suitable. Here, several solar modules uniformly exposed to the sun are brought together in one or several lines and connected to the rectifier.

Generator isolation housings

Photovoltaic systems involve more difficult disconnecting conditions than conventional installations because of the special characteristics of the current sources.

The standard IEC 60364-7-712 provides for an easily accessible interrupter between the PV generator and PV inverter.

This must be installed in close proximity to the inverter. In the absence of a lightning protector, the outer coaxial cables associated with the PV direct current cable should be protected against damage by surge protectors mounted close to the inverter.

The standards VDE V 0185 Parts 2-4 and VDS 2010, as well as the locally applicable national building code should be respected.

To ensure that the freed electrons all flow in the same direction and can be harnessed as an electric current, the front and rear faces of the solar cell must have different polarity. The silicon atoms on the front face are doped with phosphorus atoms which possess

an additional valence electron. The meter determines the supplied power and can therefore be used for settlement with the electricity supply company. The silicon atoms on the rear face are doped with boron atoms which possess only three valence electrons.

The imbalance created between the positive and negative poles enables the electrons to flow – producing electricity.



We develop together with you



We develop customised solutions in close cooperation with our clients. All of the necessary specialised professionals and divisions work together at a single location, so little time is lost between the initial inquiry and the finished product. We first create 3D drawings

and construct an initial prototype. We remain in close contact with our clients throughout the entire development process and ensure that they approve each step. Once the best solution has been found, various different production methods can be considered, from completely new injection moulding

tools to modifications of existing components in our modern CNC processing centres. Naturally, we take it upon ourselves to deal with all the necessary certification and quality testing. Our superbly equipped testing laboratory offers all that is required. **Fire protection according to UL 94** The FTT UL 94

evaluates the flammability of plastics and synthetics, which determines where the product can subsequently be employed. We use this test instrument to perform all five UL 94 fire protection tests plus the horizontal and vertical Bunsen burner tests and meet all international standards.



Climatic Exposure Test Cabinets

We test the functional safety of our products under various environmental conditions in our two climatic exposure test cabinets. Our quality control team also performs VDE, UL waterproofing and contact protection tests:

IP Protection test in

accordance with VDE

- IP 0X to 6X dust-proofing and contact protection
 - IPX4 – X8 waterproofing
- NEMA/UL Waterproofing tests in accordance with the US standard**
- Development and testing laboratory
- NEMA 4 x hose-down test

- atomized water test
- drip test

Data logger with LAB View workstation

All tests are performed using Lab View measurement data, such as dampness, temperature and current, which are collected locally via 60 distinct channels

and displayed by an efficient data logger. The evaluation is performed using DIADEM Report software. For example, we perform the standardised warming test in accordance with EN 60439, and the bypass diode test in accordance with IEC 61215.

Certifications



Trust is good – monitoring is better. Certification guarantees quality. Because we meet national and international standards, our clients are assured that they can rely on Spelsberg products.

But it is not only our enclosures and systems that are subjected to diverse testing and evaluation procedures in our own and other facilities.

Broad-spectrum quality control informs the entire enterprise and ensures smooth processes, minimises possible sources of error and ensures absolute trackability of everything from the finished product to individual components, materials and suppliers.

We also hold ourselves to high standards in the areas of work safety, environmental management and health protection.



VDE Prüf- und Zertifizierungsinstitut
VDE INSTITUT FÜR ELEKTROTECHNIK
 UND INFORMATIONSTECHNIK e.V.

ZERTIFIKAT

Registrier-Nummer: 2923/QM/02.97

Hiermit wird bescheinigt, dass das Unternehmen

Günther Spelsberg GmbH & Co. KG

mit den Standorten

Vor dem Lohe 3
99628 Buttstädt

Im Gewerbepark 1
58579 Schalksmühle

ein Qualitäts-Managementsystem für den Bereich
Herstellung und Vertrieb

Our clients are thus absolutely guaranteed to enjoy the highest quality that Germany has to offer.

Developed by qualified specialised professionals, manufactured from the best materials using the most modern processes, under excellent employment conditions and meeting all relevant standards and regulations.

Quality control for connection systems for photovoltaic modules



Because solar modules are installed outside, exposed to wind and weather, their connector socket systems have to fulfil particularly high quality standards.

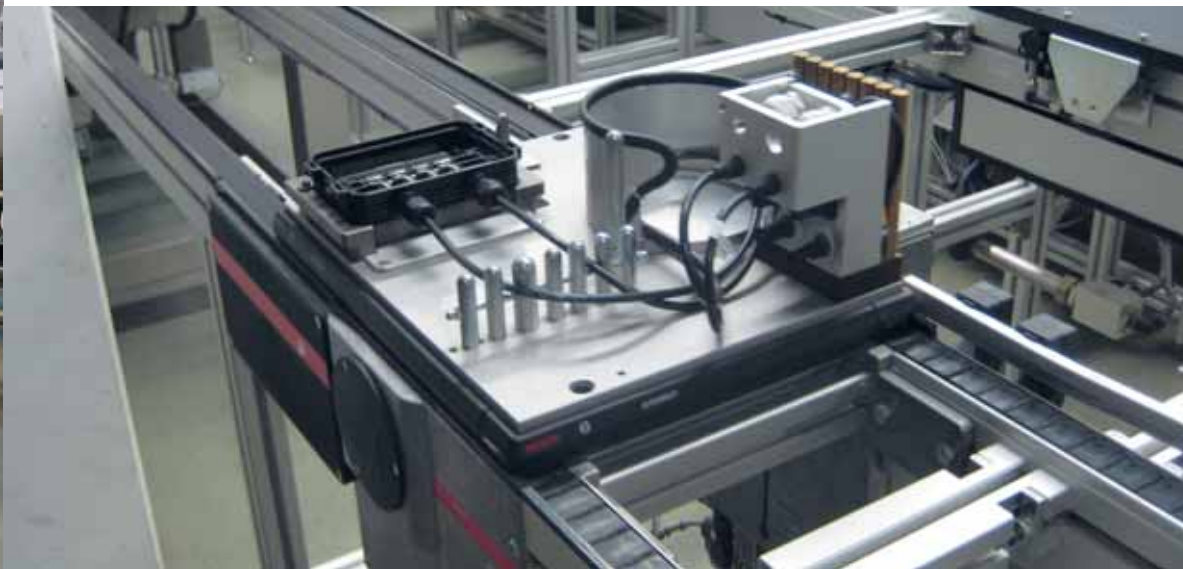
After the final installation, all products must pass the specially developed, fully automated battery of tests.

The individual systems are supported on component carriers that take them through the different stations, thus ensuring 100% testing.

Each product is completely tested and the results of the test are documented in their entirety.



■ When all the tests have been passed, the high Spelsberg quality is guaranteed and the product may be stamped with its serial and manufacturing numbers.



For example, the measuring station for electrical and electronic components assesses and evaluates the polarity and functioning of the complete circuit.

A specially developed torque screwing station, along with the SPS controlled system, ensures the correct starting torque and conformity with the protection class and strain relief of the conduit entry points.

The axial tensile test examines the retention force of the terminal enclosures and the visual inspection station evaluates the geometric characteristics and inspects the positions of the contacts and conduit entry points.

The battery of tests evaluates more than 20 quality-related parameters. All images and data are continuously recorded, evaluated and monitored.

Our Partner network



Together we are stronger:
We work with capable
partners drawn from different
areas of photovoltaics.

At regular meetings we exchange
information, share our know-how
and work on common solutions in
order to always be a step ahead
of new technological developments
and changes in the market.

Each of our network partners is an
experienced specialist and market
leader in their particular area.
Clients that trust Spelsberg profit
from the collected specialised
professional knowledge of the
top manufacturers in the industry.

