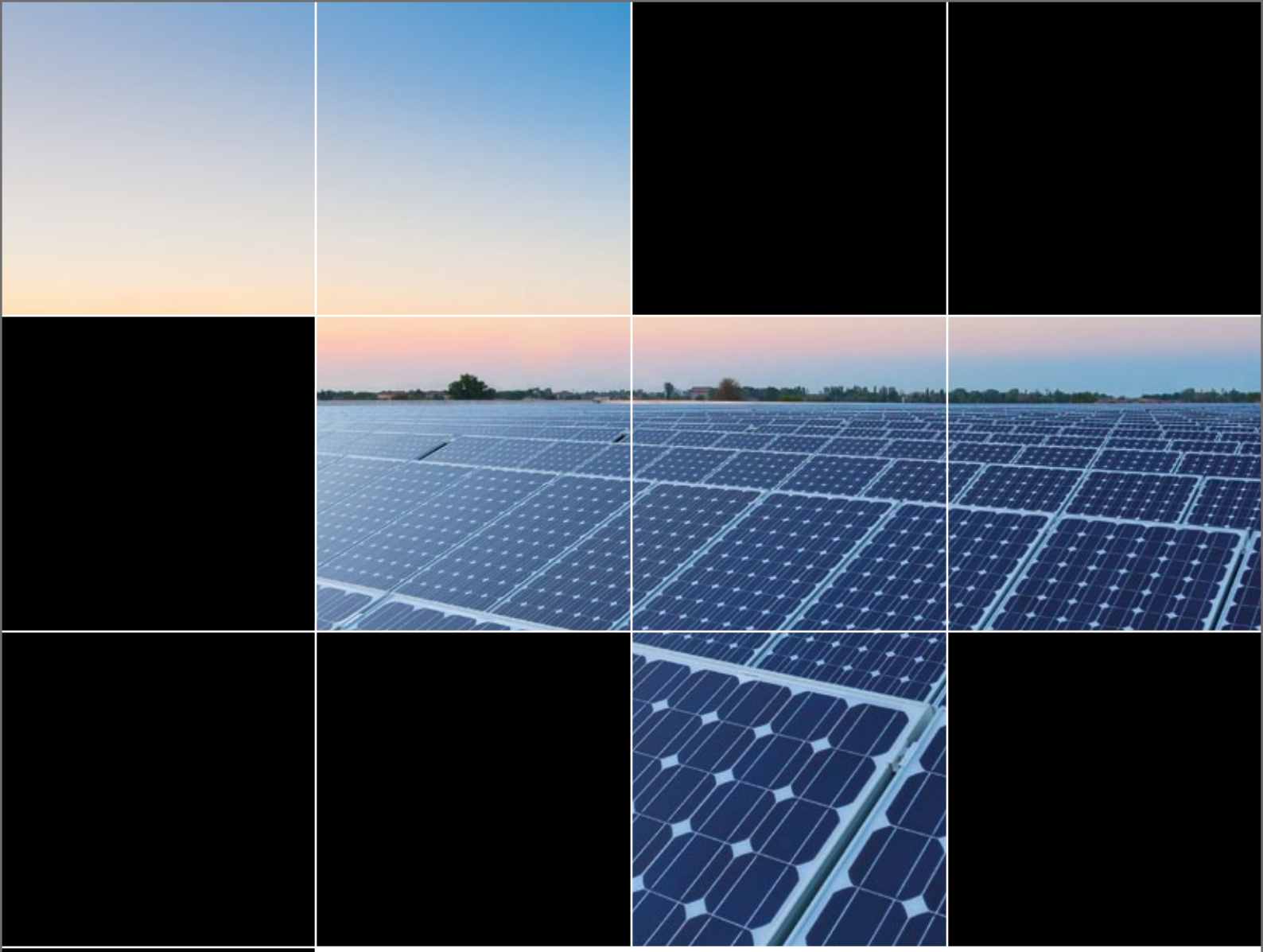


SYSTEM SOLUTIONS FOR THE SOLAR INDUSTRY

Adhesives and Sealants for Photovoltaic and Solar Thermal Applications

KÖMMERLING

KÖMMERLING CHEMISCHE FABRIK GMBH

SUNNY PROSPECTS

Renewable energies are an integral part of our modern lives. The number of solar panel manufacturers relying on KÖMMERLING solutions is increasing steadily. Our product portfolio is designed to meet the rigorous requirements placed on solar equipment by the wide range of environments where they are used.

PHOTOVOLTAICS AND SOLAR THERMAL ENERGY

EFFICIENT – RESOURCE-FRIENDLY – SUSTAINABLE

For new buildings as well as for the renovation of old ones, energy generation through solar modules in the form of photovoltaics and solar thermal energy plays an important role. Roof and façade areas are most frequently used for this purpose.

The 2010 EU Energy Performance of Buildings Directive EPBD stipulates that from 2019, every new public building and from 2021, every new building in general must be built as a “nearly zero energy building”. This directive also applies to renovations that affect more than 25 % of a building’s envelope.

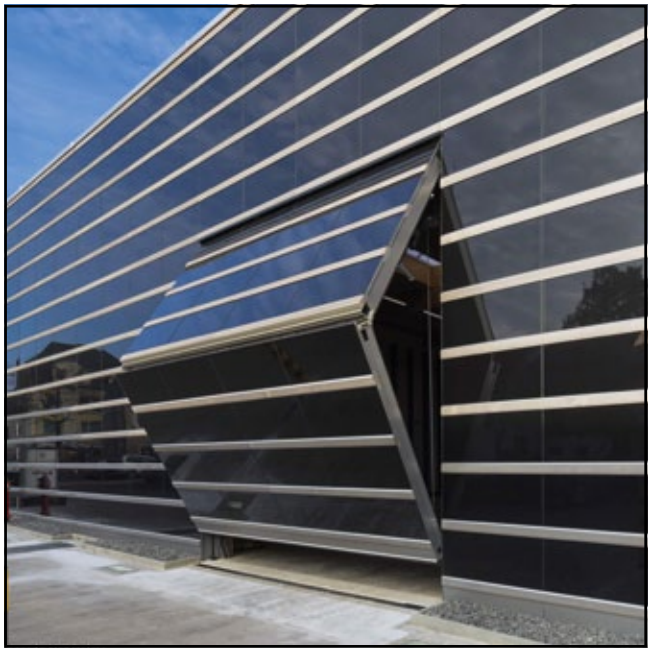
The integration of solar thermal collectors (BiST = building-integrated solar technology) and/or photovoltaic modules (BiPV = building-integrated photovoltaics) into the building envelope is an energy-efficient alternative to traditional filling elements and makes a sustainable contribution to the conservation of resources.

Besides regenerative power and heat generation, BiST/BiPV elements can also take over additional functions, such as heat and sound protection in the façade, and offer a multitude of possibilities for architectural design. In this way, BiST and BiPV not only combine ecological responsibility and innovative technologies, but also provide a way to protect the climate that is visually attractive.

KÖMMERLING develops and produces high-quality matching adhesives and sealants for photovoltaic and solar system components and their integration into the building envelope. Our product ranges HelioSeal® and HelioBond® were developed especially for thin-film, crystalline modules and solar thermal applications. They are resistant to changing weather conditions, such as rain, snow, wind, temperature, as well as UV radiation, and offer excellent long-term stability.

Environmental Protection with KÖMMERLING

With our adhesives and sealants for photovoltaic and solar thermal applications, as well as for façades, we are making valuable contributions in terms of sustainability and environmental protection. Ultimately, however, our products are not the only thing that helps to protect resources. Our effective environmental and energy management also guarantees that the impact of our operations will be ecologically sustainable in the long term.



PHOTOVOLTAIC MODULES

Photovoltaic modules are permanently exposed to extreme conditions, such as heat, cold, moisture, UV radiation and wind. To protect the module components against ageing and functional impairment, excellent sealing is therefore necessary.

The focus is thus on edge sealants that are impermeable to moisture vapour and which are intended for use in high-performance thin-film and crystalline modules with moisture-sensitive coatings.

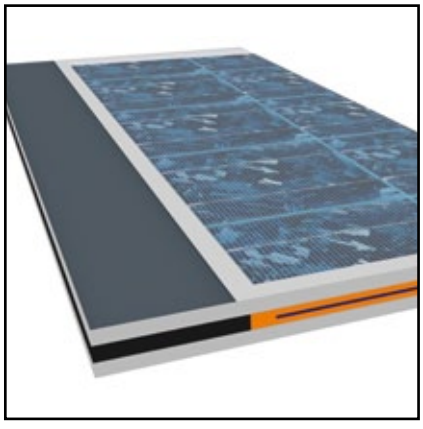
EDGE SEALING OF PHOTOVOLTAIC MODULES

KÖMMERLING sealant systems for glass and frame sealing prevent intrusion of water and other contaminants and drastically reduce diffusion of gasses like water vapour, oxygen, nitrogen and sulphur oxides from the air. A distinction is made in this context between “inner sealing” (between the glass) and “outer sealing” (sealing the frame).

Inner Sealing

HelioSeal® PVS 101
Modified polyisobutylene

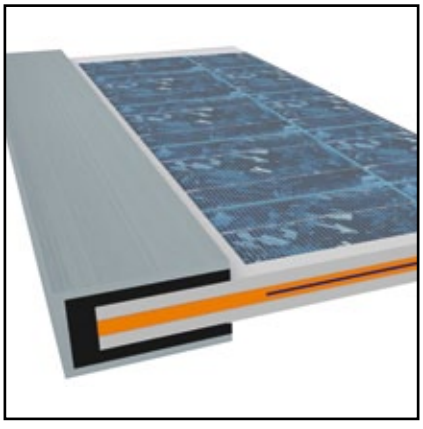
- For edge sealing of crystalline or thin-film modules
- Moisture vapour barrier
- Excellent UV resistance
- High electrical resistance
- High dielectric strength
- Enhanced adhesion from our chemical cross-linking
- Available in hot melt or tape forms
- Excellent long-term stability
- UL certification



Outer Sealing

HelioSeal® PVS 120 R
Modified polyisobutylene

- For sealing photovoltaic module frames
- Solvent-free
- Moisture vapour barrier
- High electrical resistance
- Broad adhesion spectrum
- High green strength
- Very good adhesion to glass, aluminium and steel
- High heat resistance



JUNCTION BOX

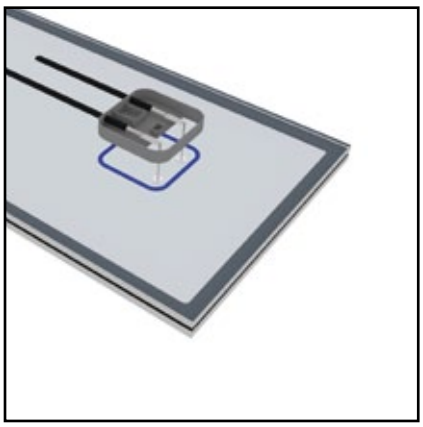
Sealing against moisture vapour intrusion and long-term adhesion are the two biggest challenges when attaching junction boxes. KÖMMERLING products are specially designed to meet these challenges.

Junction Box Bonding

HelioBond® PVA 205

RTV 1-component silicone

- Very good long-term stability
- Excellent UV resistance
- Broad adhesion spectrum
- High strength
- UL certification

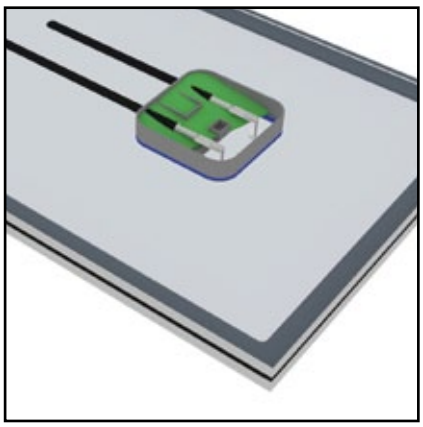


Junction Box Potting

HelioSeal® PVS 800

Modified polyisobutylene

- Moisture vapour barrier
- High electrical resistance
- High dielectric strength
- UL certification



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BACK RAIL BONDING

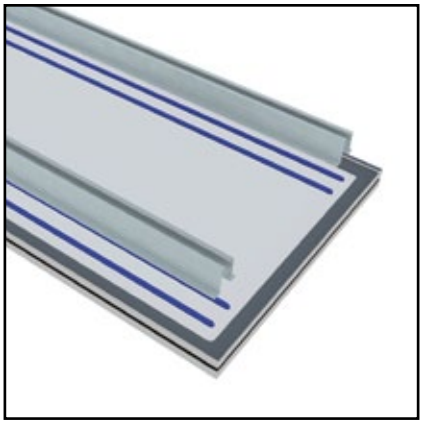
For frameless mounting of crystalline modules, the mounting brackets are bonded to the back of the module with RTV 2-component silicone. One advantage of this mounting system is that the forces exerted on the module are distributed equally across the surface and stress peaks are avoided. In addition, the adhesive creates a balance between the different thermal expansion coefficients of the glass and the mounting profile, which helps ensure long-term reliability.

HelioBond® PVA 200 | HelioBond® PVA 200 D*

RTV 2-component silicone

- Very good long-term stability
- Broad adhesion spectrum
- High load capacity
- Complies with the requirements of ETAG 002
- UL certification (PVA 200)

*D = deep black



BONDING OF FLEXIBLE PHOTOVOLTAIC MODULES

Compared to rigid photovoltaic modules, flexible modules are thin and very light. Bonding also allows them to be attached to curved surfaces. This makes them ideally suited for installation on low slope roofs or where wind, snow or seismic loads make the installation of rigid racked modules impractical. They are also well suited to marine, recreational vehicle and freight carrier applications.

HelioBond® PVA 600BT

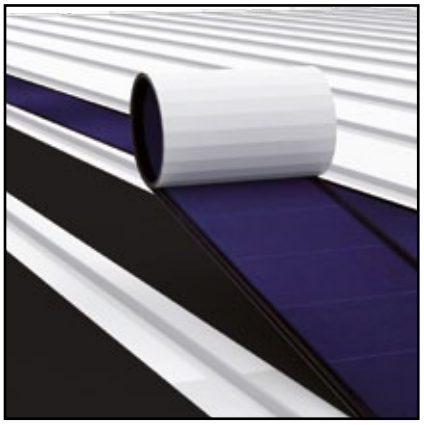
Cross-linked butyl tape

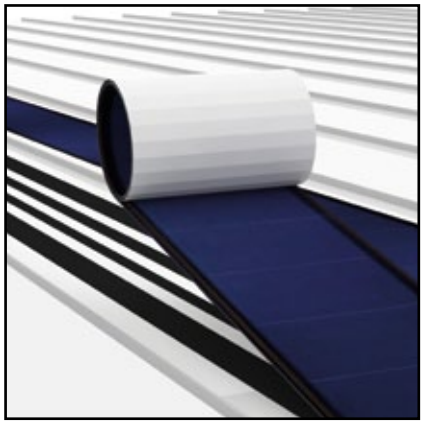
- High green strength
- Broad adhesion spectrum
- Very good long-term stability
- Simple installation
- High heat resistance
- UL certification

HelioBond® PVA 400

1-component MS polymer

- Broad adhesion spectrum
- Good long-term stability
- For faster curing also available as 2-component system
- UL certification





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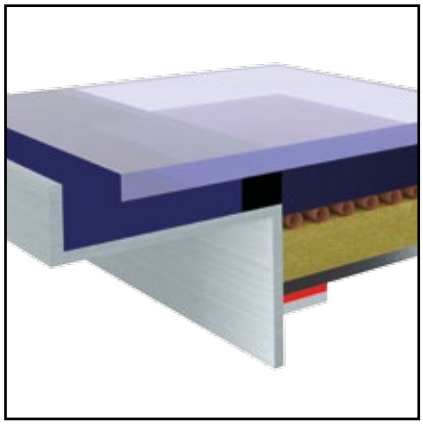
SOLAR THERMAL COLLECTORS

Solar thermal panels generate useable heat directly from the sun's energy. To do this both economically and reliably the panel must be protected from a wide variety of environmental conditions including snow, wind, rain and the effects of direct sunlight for decades to come. KÖMMERLING HelioSeal® and HelioBond® products meet these needs head-on to assure the long lifecycle expected.

The HelioBond® PVA 200 range is used for bonding the cover glasses to the frame of the solar thermal collectors. The adhesive does not only compensate for thermal, chemical and mechanical stresses, but also ensures excellent stability of the entire collector.

COVER GLASS BONDING



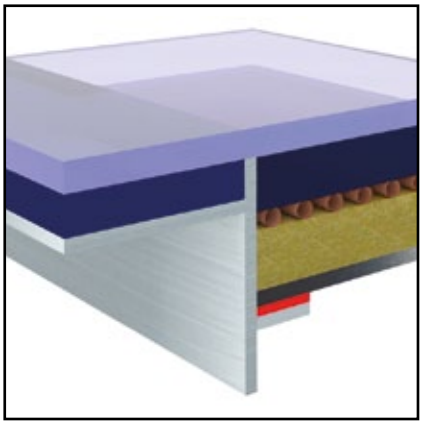
HelioBond® PVA 200 | HelioBond® PVA 200 D*
HelioBond® PVA 200 F*

RTV 2-component silicone

- Very good long-term stability
- Excellent UV resistance
- Broad adhesion spectrum
- High strength
- UL certification (HelioBond® PVA 200)

*D = deep black | F = fast curing

BASE SHEET BONDING

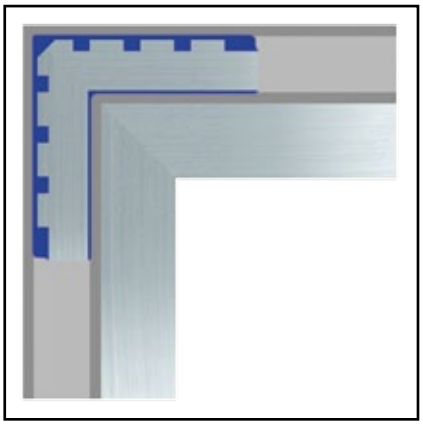


HelioBond® PVA 400

1-component MS polymer

- Broad adhesion spectrum
- Very good long-term stability
- For faster curing also available as 2-component system
- UL certification

CORNER ANGLE BONDING



Körapur 666

2-component polyurethane

- Structural bonding
- Simple handling due to special cartridge system
- Fast dosing – no static mixer necessary

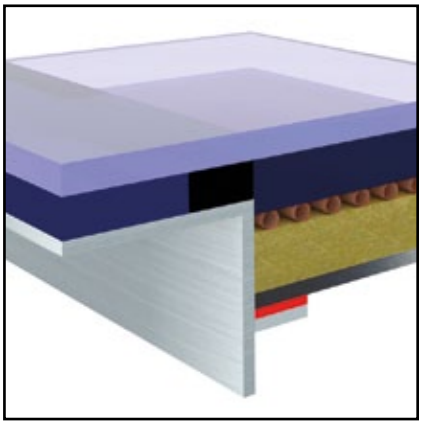
AIRTIGHT COLLECTOR AND DOUBLE-GLAZED COLLECTOR

HelioSeal® PVS 100 Plus in combination with HelioBond® PVA 200 | HelioBond® PVA 200 D*

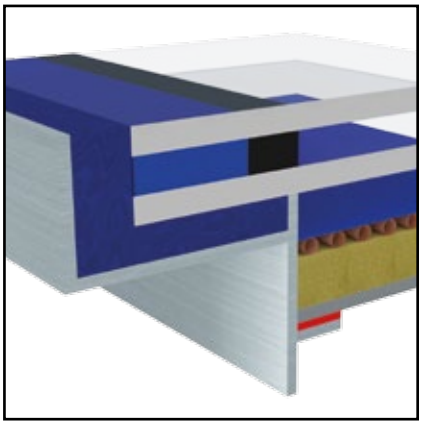
Modified polyisobutylene

- Moisture vapour barrier
- Flexible spacer
- Desiccant inside
- High temperature resistance
- Very good insulation properties

*D = deep black



Airtight collector



Double-glazed collector

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KÖMMERLING – YOUR SYSTEMS PARTNER

COMPETENCE AND SERVICE

The key to long-term reliability of solar modules and solar thermal collectors is complete system integration from start to finish. Durable sealing and bonding depend on compatibility among all materials, so KÖMMERLING offers total system solutions for all your sealing and bonding needs.

With our competent advice on product selection, processes and quality assurance we enable you to apply adhesive technology safely. We consider ourselves a systems provider, offering not only high-quality products, but also additional consulting and support services tailored to you and your needs throughout the entire duration of your project.

Bespoke customer service is crucial for us – which includes on-site support. Whether you need help with the selection of the right adhesives for a project, with integration into your production process or with quality and production control – we are your competent partner!

PRODUCT OVERVIEW

HelioSeal® and HelioBond®

HelioSeal®	Basis	Properties	Applications	UL certification
PVS 100 Plus	Modified polyisobutylene	▪ Moisture vapour barrier ▪ Desiccant inside ▪ High temperature resistance	▪ Edge sealing of solar thermal collectors	✕
PVS 101	Modified polyisobutylene	▪ Moisture vapour barrier ▪ Desiccant inside ▪ High electrical resistance	▪ Inner sealing ▪ Edge sealing for crystalline and thin-film PV modules	✓
PVS 120 R	Modified polyisobutylene	▪ Moisture vapour barrier ▪ Good adhesion to glass, aluminium and steel ▪ High green strength	▪ Outer sealing ▪ Framing of PV modules	✕
PVS 800	Modified polyisobutylene	▪ Moisture vapour barrier ▪ High electrical resistance	▪ Junction box potting and sealing of cable feedthrough	✓

HelioBond®	Basis	Properties	Applications	UL certification
PVA 200	RTV 2-comp. silicone	▪ UV-stable ▪ High modulus ▪ Compliant with ETAG 002	▪ Structural bonding of PV modules ▪ Bonding of cover glasses in ST modules ▪ Back rail bonding	✓
PVA 200 D		▪ Deep black variant		✕
PVA 200 F		▪ Faster curing		✕
PVA 205	RTV 1-comp. silicone, oxime curing	▪ UV-resistant ▪ Very good long-term stability ▪ High elongation at break ▪ Broad adhesion spectrum	▪ Junction box bonding ▪ Framing of PV modules	✓
PVA 400	1-comp. and 2-comp. MS polymer	▪ Very good long-term stability ▪ Broad adhesion spectrum	▪ Bonding and sealing of PV and ST components	✓
PVA 600BT	Cross-linked butyl tape	▪ Very good long-term stability ▪ High heat resistance	▪ Attachment of flexible PV modules	✓

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