



SONNENSTROM
FABRIK

Excellent
GLASS GLASS





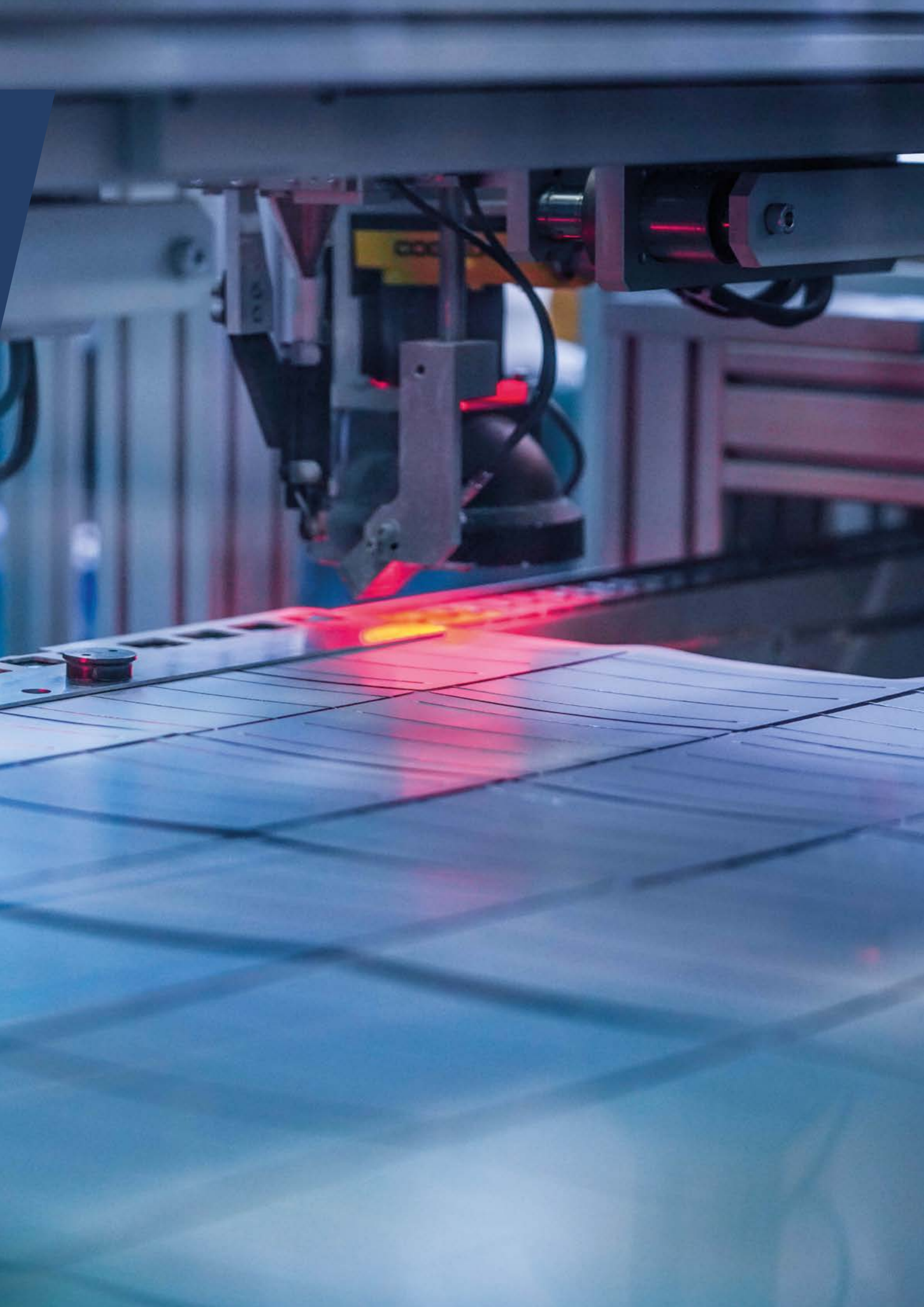
Glass/glass PV modules Benefits at a glance

1. Up to 60 % more yield thanks to longer lifespan and minimal degradation
2. Sustainable, carbon-reduced production in Germany
3. High-quality three-chamber lamination process provides optimum protection against delamination
4. Maximum protection against cell microcracks, hotspots and snail trails
5. Improved fire safety
6. Enhanced hail impact testing
7. Verified protection against adverse environmental conditions such as wind and snow loads, salt spray, ammonia, sand abrasion, etc.
8. Special snow load frame (optional) tested for loads of up to 825 kg/m²
9. All risk cover (optional)

We aspire to excellence

Over the past 25 years, **Sonnenstromfabrik** has established itself as one of Europe's leading manufacturers of top-quality photovoltaic modules, employing the latest technologies at its high performance module plant in Wismar, Northern Germany.

Sonnenstromfabrik is part of the CENTROTEC Group. CENTROTEC Sustainable SE, which has its registered office in Brilon, Germany, focuses on the area of energy-saving technologies in buildings. In 2020 CENTROTEC posted revenue of more than EUR 700 million. The CENTROTEC Group is one of Europe's leading players in its field thanks to its innovative energy-saving solutions and has a presence in over 50 countries worldwide.



100 % Made in Germany - fair and sustainable

- ✓ 0,025% claim rate
- ✓ As one of the few companies that still produces exclusively in Germany, Sonnenstromfabrik benefits from short logistics chain which ensure excellent supply security and allow us to make 99,5 % of deliveries on schedule
- ✓ Order-based production guarantees that you always receive exactly what you need
- ✓ Products are manufactured in accordance with the highest German quality, work and environmental standards
- ✓ Production processes are optimised and audited to limit carbon emissions
- ✓ Short transportation paths reduce carbon emissions
- ✓ Equitable and valuable German warranty
- ✓ All modules available with a German Certificate of Origin



FL 201
Stringer 1
Linie 1

FL 202
Stringer 2
Linie 1

FL 201 Stringer 1, FL 202

Highly innovative
products are
our speciality



The "Excellent Glass/ Glass" PV module series is significantly more durable than conventional photovoltaic modules

High-transparency, low-iron solar glass
with anti-reflective coating, 2 mm thick

UV-resistant, moisture-blocking encapsulation film

Mono PERC high performance cell in
black – single-facial or bi-facial

UV-resistant, moisture-blocking
encapsulation film

High-transparency, low-iron solar glass,
2 mm thick

UV-resistant, moisture-blocking
encapsulation film

Backsheet
transparent | white | black | full black



- ✓ Junction box with sealed diodes for improved cooling – 1 000 volts | 1 500 volts
- ✓ Fire-resistant cables – 1 000 volts | 1 500 volts
- ✓ Original MC4 connectors

Aluminium frames, black anodised and approved for
loads of up to 825 kg / m² – optional snow load frame

Thoroughly tested

Rigorous resistance testing under extreme environmental conditions such as

- ✓ impact from hail
- ✓ wind and snow loads
- ✓ salt spray
- ✓ ammonia
- ✓ sand abrasion
- ✓ etc.

TÜV-certified resistance to high mechanical pressure loads of up to 825 kg / m², or 8 100 Pa and comprehensive certifications in accordance with the latest requirements



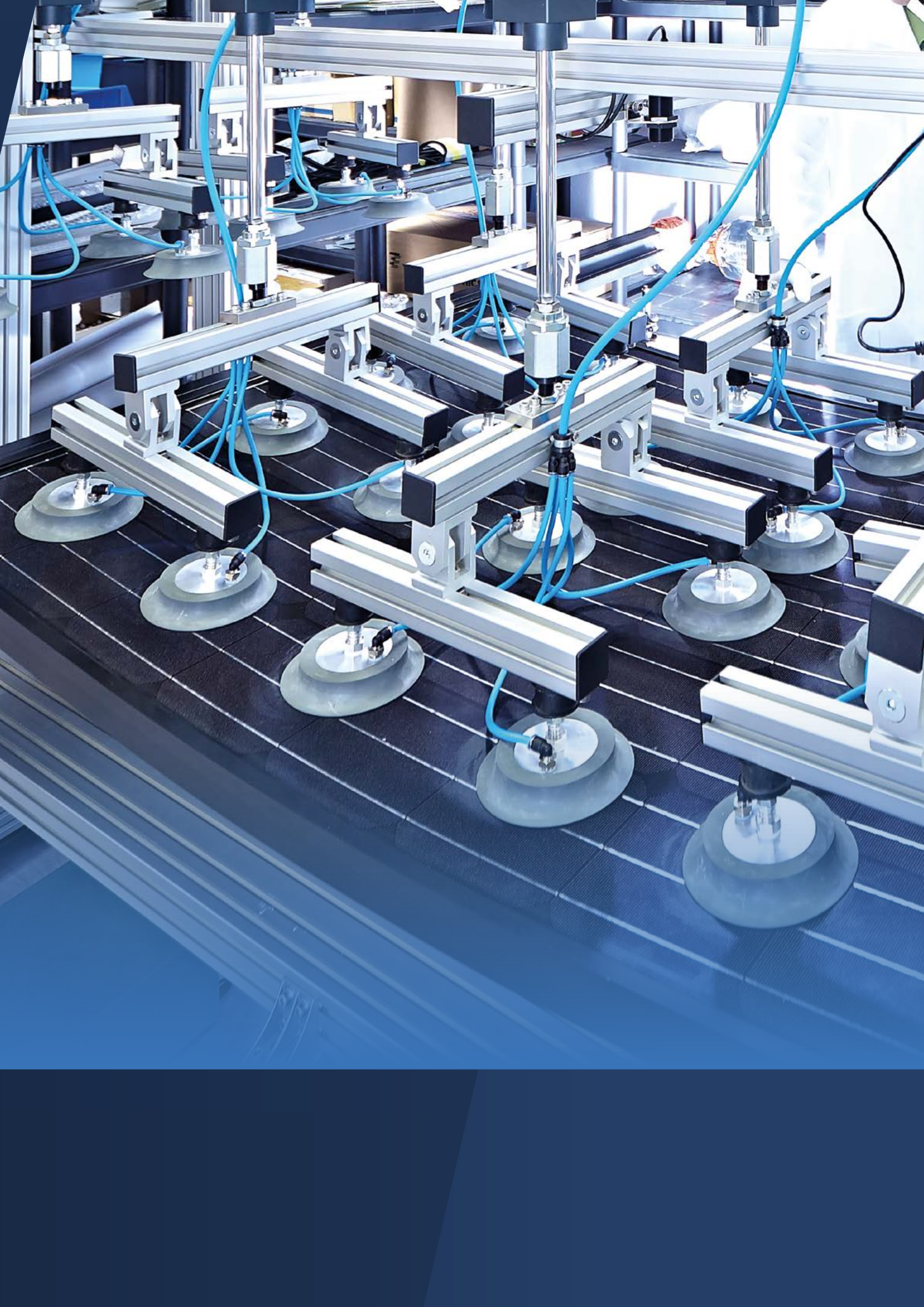
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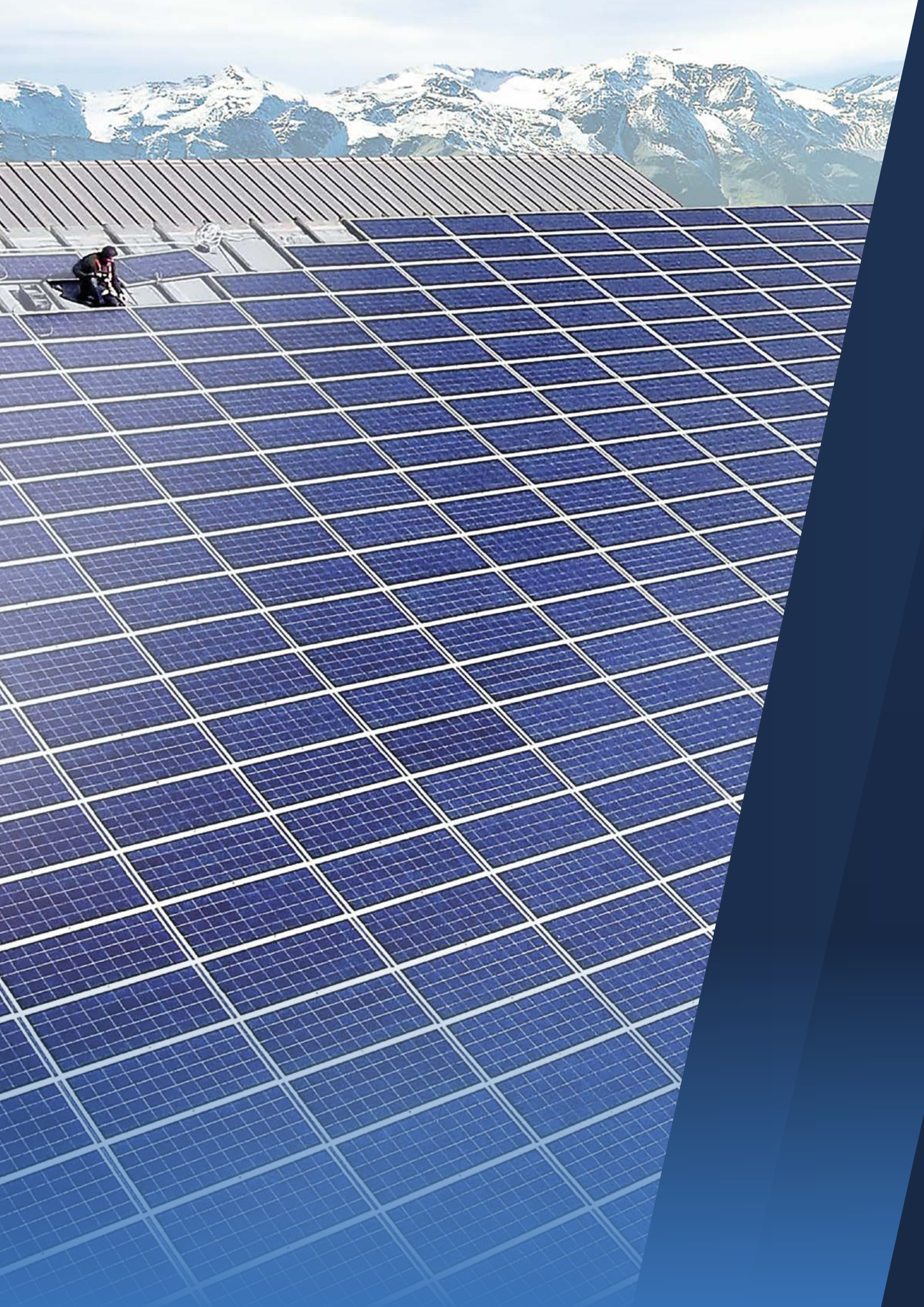


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Zertifiziert nach
DIN EN ISO 9001
DIN EN ISO 14001
DIN EN ISO 45001







Glass/glass modules – high resistance under the most extreme conditions

Outstanding for snow load zones

The solid connection between the two glass layers of the Sonnenstromfabrik glass/glass modules allows for greater resistance. Using a second layer of glass gives the glass/glass modules torsional strength and stability that cannot be achieved by glass/foil modules. The special frame construction also offers added protection against damage. The result: outstanding suitability for all snow load zones. All of our modules are tested to withstand pressure loads of 8 100 Pa, which corresponds to 825 kg / m².

Stability against hail / wind / severe weather

In an enhanced hail test, we fired hailstones with a diameter of 3 cm at our modules from close range and the modules remained unharmed. Our glass/glass modules also withstand extreme wind loads (tensile load) of up to 3 600 Pa without incurring damage.

Resistance to chemical substances in agriculture and industry

Different to plastic compounds, glass is impervious to most aggressive chemical substances and can therefore be integrated into buildings used for agricultural purposes or into chemical parks without sustaining any damage. Ammonia and other similar substances have no impact. The modules will not show any evidence of premature ageing.

Protection against sand and salt abrasion


Sonnenstromfabrik glass/glass modules have proven durable even in desert and coastal regions with high densities of particles in the air. Both sand and salt particles can act like sandpaper on PV modules. However, the back layer of glass ensures that our modules' cells are reliably protected against abrasion, making them particularly suited to locations with high exposure.

Elegant module design for roofs, carports, façades and complex architecturee

- ✔ Available with optional structured or float glass
- ✔ 10 %, 19 %, 27 % and 51 % transparency available







Carbon-reduced production ensures maximum sustainability

- ✔ The production of Sonnenstromfabrik PV modules has been optimised for minimal carbon emissions and audited by an external testing institute.
- ✔ We operate our machines almost exclusively with solar power produced from our own solar modules, and employ state-of-the-art filter technology.
- ✔ Our plant produces 40 % less carbon per module compared to the conventional industry average in Germany.
- ✔ Carbon emissions are 70 % lower than those of our Chinese competitors.
- ✔ With our Low Carbon series we use exclusively primary materials from CO₂-certified manufacturers for our Low Carbon product range.
- ✔ At the end of our PV modules' over 40-year-lifespan, we take them back and recycle them in accordance with the latest standards.



High performance warranty and guaranteed higher yield thanks to long lifespan and warranty extension

Sonnenstromfabrik glass/glass PV modules withstand the harshest conditions, thus ensuring long-term, steady yields.

A longer yield phase is directly correlated with greater financial benefits for operators.

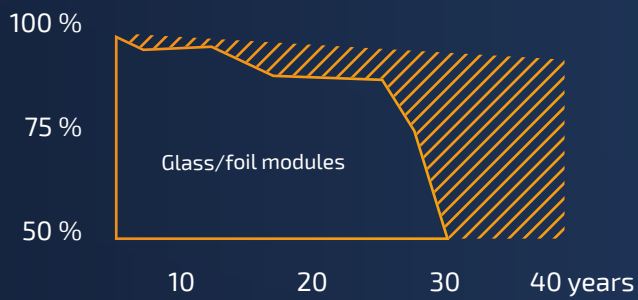
Over their 40-year lifespan, our glass/glass modules produce over 60 % greater yield than glass/foil modules.

Each module comes with a linear power warranty which guarantees 87 % output after 30 years. Moreover, Sonnenstromfabrik offers the option of extending glass/glass module product warranties to 30 years. Sonnenstromfabrik's power warranty extends well beyond the industry standard, making it one of the best in the market.

	Industry standard	Excellent Glass/Glass
Product warranty	max. 10 years	20 years
Optional extension of the product warranty	no	yes, 30-year option
Power warranty	in stages	linear
Power warranty after 1 year	none	97 %
Power warranty max.	20 years	30 years, 87 %
Max. annual power decline from 2nd year	n/a	0,35 %
Total care protection	no	yes, optional

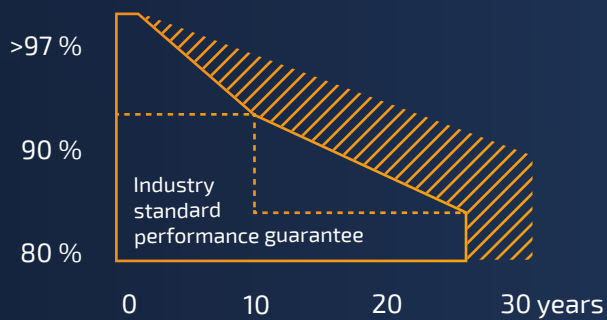
Performance

> 60 % additional yield with glass/glass modules



Performance

Linear performance guarantee of 87 % after 30 years





Optional total care protection for your photovoltaic installation¹

Sonnenstromfabrik offers the perfect total care protection for your photovoltaic system upon request. Not only does it insure your modules, it also covers all of the installation's components including the energy storage system as well as any yield losses. This cover is offered in cooperation with the insurance company Ergo Versicherung AG. The burden of proof lies with the insurer.

Insured services

All risk cover

- ✓ Severe weather
- ✓ Mechanical and electrical issues
- ✓ Theft and vandalism
- ✓ Construction or design flaws

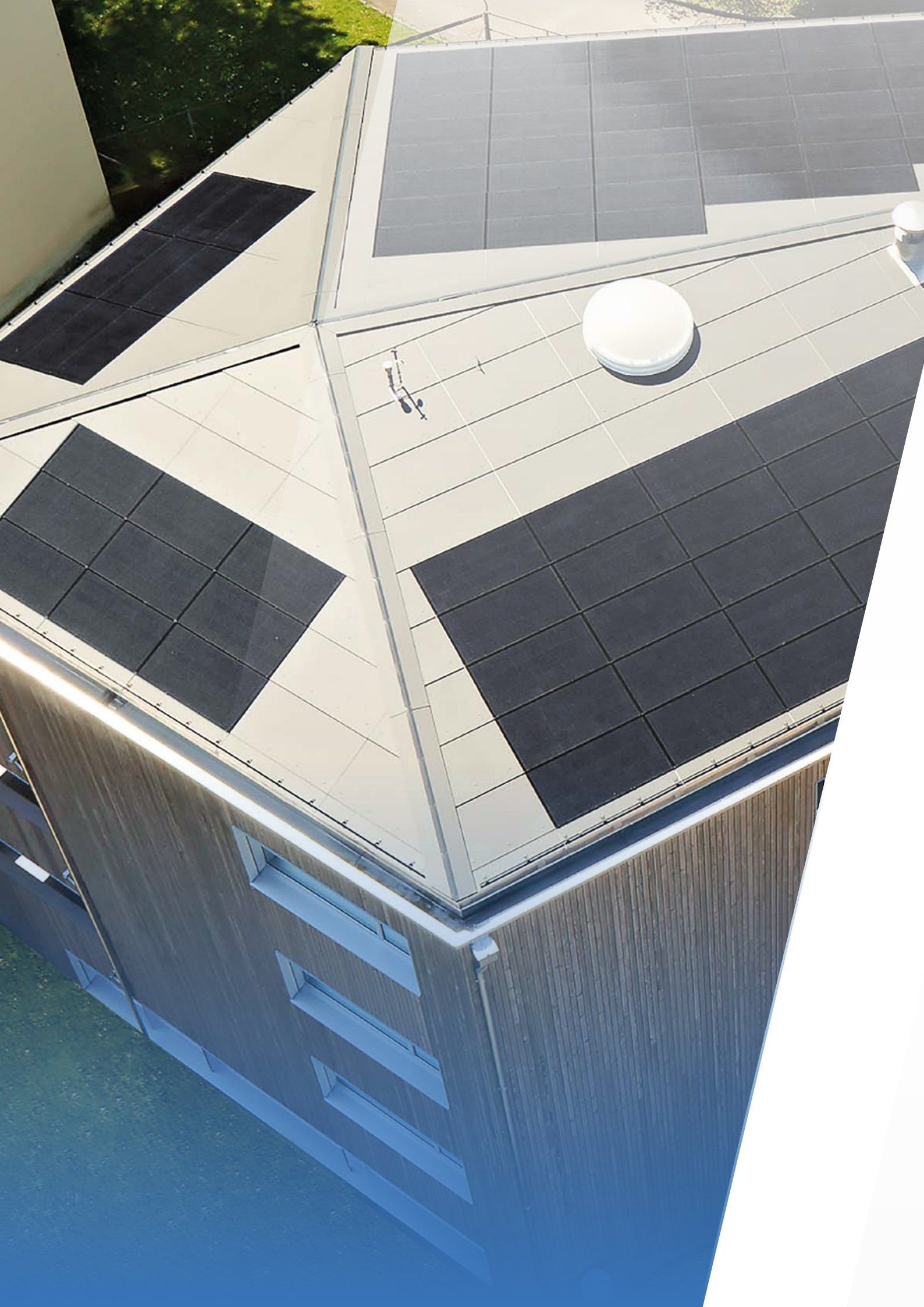
Yield loss cover

Should your photovoltaic installation no longer be fully functional on account of material damage, the insurer will cover any yield lost right from day one!

Reduced yield cover

The insurer will offer compensation should the annual energy yield sink below 90 % of the forecast amount (e.g. on account of limited solar irradiation or defective components).

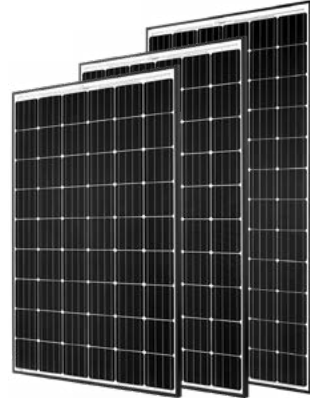
¹Only for informational purposes; the terms of insurance from Ergo Versicherung AG apply. Prices and conditions available upon request.



Unparalleled product range

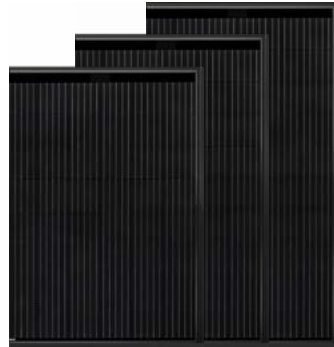
Excellent models

- ✓ 54 cells (1 550 x 1 000 mm)
- ✓ 60 cells (1 700 x 1 000 mm)
- ✓ 72 cells (2 050 x 1 000 mm)



Integration models

- ✓ 48 cells (1 443 x 1 025 mm)
- ✓ 54 cells (1 593 x 1 025 mm)
- ✓ 60 cells (1 743 x 1 025 mm)



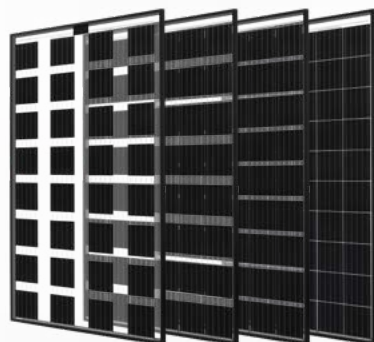
Colours

- ✓ Transparent (balance)
- ✓ White (smart)
- ✓ Black (black)
- ✓ All black (full black)



Transparency

- ✓ 51 % (Brilliant series)
- ✓ 27 % (Brilliant series)
- ✓ 19 % (Brilliant series)
- ✓ 10 % (Excellent series)





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