

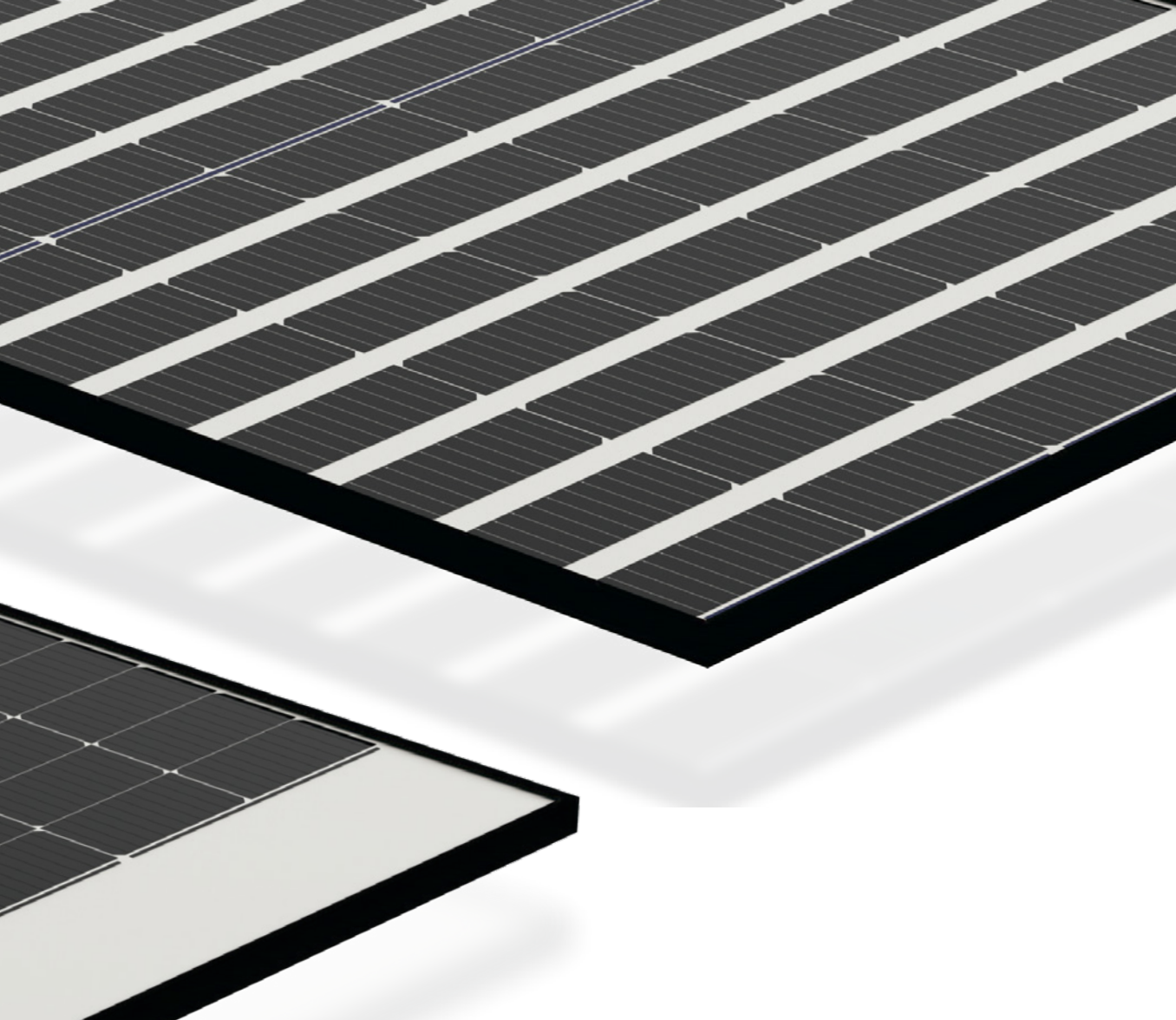
BISOL Lumina

Bifacial PV modules with transparent backsheet
for improved transmittance of natural light.



Solar company!





BISOL Lumina

Bifacial Monocrystalline PV Modules with Transparent Backsheet

BISOL Lumina modules with transparent backsheet are made in the same dimensions as standard PV modules but contain fewer cells and with bigger gaps between them to allow natural light to pass through.

They are suitable for **winter gardens, skylights, greenhouses, sunshades, car canopies** or **other** buildings which require better lighting.

The standard **matrix** offers a perfect **transparent area** to allow enough light to shine through.

The modules can be delivered with a **standard** or **Solrif frame** for building-integrated applications, as well as without frame in the form of laminates.

Advantages:



Designed and manufactured in EU



Choice of standard or BIPV frame



Available with or without frame



Natural light transmission



Transparent back foil



Bifacial module



Excellent low light performance



On-roof or BIPV

All BISOL PV modules are designed and manufactured in the heart of European Union in Slovenia. Contact us if you are interested to visit our BISOL Production!

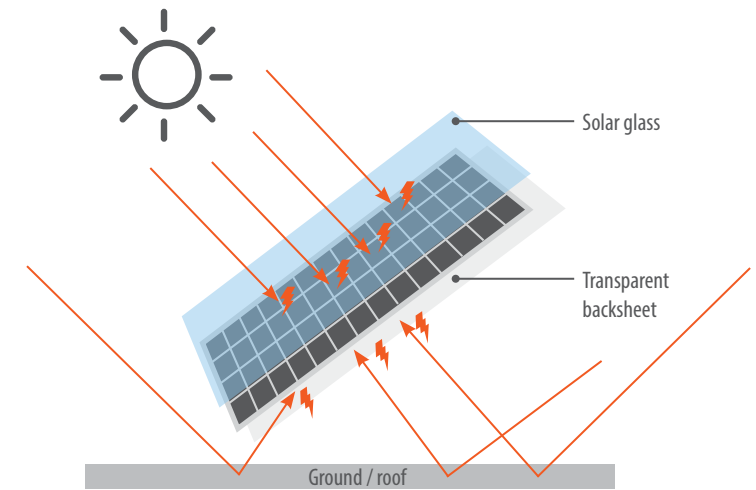
Did you know?

- ▶ BISOL Lumina modules offer the best power/transparency ratio.

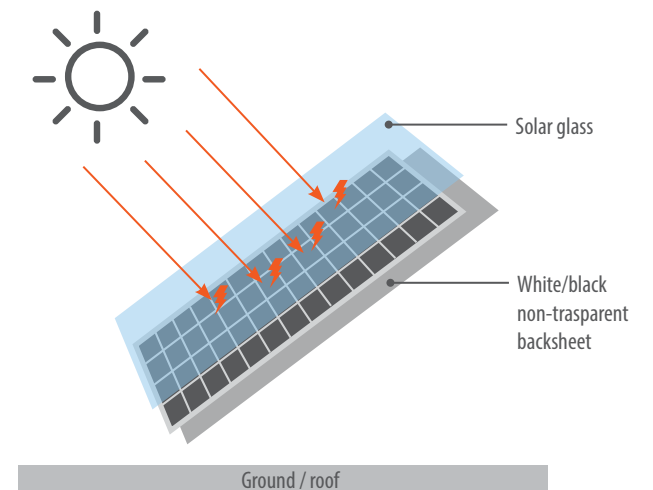
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Bifacial Monocrystalline PV Modules with Transparent Backsheet

Bifacial Module with Transparent Backsheet Technology



Standard Module without Transparent Backsheet Technology



Since the solar cells in the panels are bifacial, from a few and up to 60 % of the initial output power can be gained from the back side of the module, depending on reflecting properties of the surface behind and the design of the PV system.

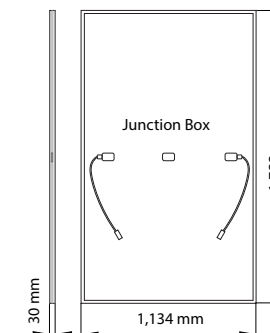
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Bifacial Monocrystalline PV Modules with Transparent Backsheet / BDO 320 Wp

| Module Type | BDO | 320 | | | | |
|-------------------------|----------------|---------------|---------------|------|------|------|
| Number of Cells | | 84 | | | | |
| Cell Matrix | | 6 x 7 + 6 x 7 | | | | |
| Transparent Area | m ² | 0.50 | | | | |
| | % | 26.5 | | | | |
| | | Front | Bifacial Gain | | | |
| Light Source | % | 100 | 10 | 20 | 30 | 40 |
| Nominal Power | P_{MPP} [W] | 320 | 352 | 384 | 416 | 448 |
| Short Circuit Current | I_{SC} [A] | 13.7 | 15.0 | 16.3 | 17.6 | 18.9 |
| Open Circuit Voltage | V_{OC} [V] | 31.0 | 31.1 | 31.3 | 31.4 | 31.5 |
| MPP Current | I_{MPP} [A] | 13.0 | 14.2 | 15.5 | 16.7 | 17.9 |
| MPP Voltage | V_{MPP} [V] | 24.7 | 24.8 | 24.9 | 25.0 | 25.1 |
| Module Efficiency | η_M [%] | 16.4 | | | | |
| Power Output Tolerance | | ±3 % | | | | |
| Maximum Reverse Current | | 25 A | | | | |
| Maximum System Voltage | | 1,500 V | | | | |
| Protection Class | | Class II | | | | |

Additional power classes available upon request. | Efficiency at irradiation 200 W/m²: 99.3 % of STC efficiency or higher. | Tolerances for V_{OC} and I_{SC} are 3 %.

Dimensions



Cell stringing is a process where time and temperature correlation define the quality of the solder joint. It is crucial to set the right combination of both, which is why all operators in BISOL are actually engineers and the quality of the soldering joint is checked by peel test daily.



Unlike many solar manufacturers, BISOL sends every single module through EL test, which can proven by a unique tracking system. It is important to check the module for potential micro-cracks or other irregularities before lamination when all defects can still be repaired. This way, all the final products are 100 % reliable.

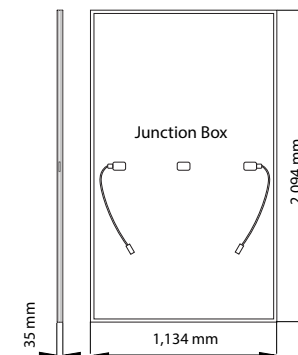
BISOL Lumina

Bifacial Monocrystalline PV Modules with Transparent Backsheet / BBO 410 Wp

| | | | | | | |
|-------------------------|----------------|---------------|---------------|------|------|------|
| Module Type | BDO | 410 | | | | |
| Number of Cells | | 108 | | | | |
| Cell Matrix | | 6 x 9 + 6 x 9 | | | | |
| Transparent Area | m ² | 0.52 | | | | |
| | % | 22.5 | | | | |
| | | Front | Bifacial Gain | | | |
| Light Source | % | 100 | 10 | 20 | 30 | 40 |
| Nominal Power | P_{MPP} [W] | 410 | 451 | 492 | 533 | 574 |
| Short Circuit Current | I_{SC} [A] | 13.3 | 14.6 | 15.8 | 17.1 | 18.4 |
| Open Circuit Voltage | V_{OC} [V] | 39.6 | 39.7 | 40.0 | 40.0 | 40.1 |
| MPP Current | I_{MPP} [A] | 12.5 | 13.7 | 14.9 | 16.1 | 17.3 |
| MPP Voltage | V_{MPP} [V] | 32.8 | 33.0 | 33.1 | 33.2 | 33.2 |
| Module Efficiency | η_M [%] | 17.3 | | | | |
| Power Output Tolerance | | ±3 % | | | | |
| Maximum Reverse Current | | 25 A | | | | |
| Maximum System Voltage | | 1,500 V | | | | |
| Protection Class | | Class II | | | | |

Additional power classes available upon request. | Efficiency at irradiation 200 W/m²: 99.3 % of STC efficiency or higher. | Tolerances for V_{OC} and I_{SC} are 3 %.

Dimensions





BISOL Lumina

Bifacial Monocrystalline PV Modules with Transparent Backsheet

Thermal Specifications

| | | |
|---------------------------------|----------|--------------------|
| Current Temperature Coefficient | α | + 0.05 %/°C |
| Voltage Temperature Coefficient | β | - 0.26 %/°C |
| Power Temperature Coefficient | γ | - 0.34 %/°C |
| NOCT | | 43 ± 2 °C |
| Temperature Range | | - 40 °C to + 85 °C |

In compliance with:



Certificates available upon special request. Additional charges may apply.

Guarantees:

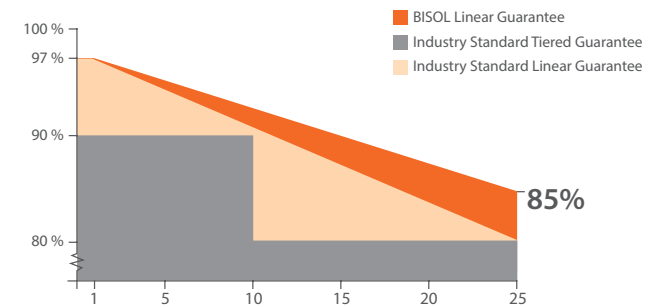


Product Guarantee
Standard: 15 years
Extra: 20 years



Linear guarantee
85 % output in 25th year

BISOL products are thoroughly tested and comply with the principal international standards. In the TÜV-performance-over-time testing which is equivalent to 20 years of module operation, the BISOL modules exhibited the lowest degradation rate of just 0.5 % out of the permitted 5.0 %.



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Bifacial Monocrystalline PV Modules with Transparent Backsheet

Mechanical Specifications

| | |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------|
| Length x Width x Thickness | BDO: 1,722 x 1,134 x 30 mm BBO: 2,094 x 1,134 x 35 mm |
| Weight | BDO: 22 kg / BBO: 26 kg |
| Solar Cells | Half-Cut mono Bifacial c-Si / 182 mm x 91 mm |
| Junction Box / Connectors / IP | Three bypass diodes / MC4 compatible / IP 68 |
| Cable Length | Default: 1,200 mm On demand (for portrait orientation): 300 mm |
| Frame | Anodized Al with drainage holes / rigid anchored corners |
| Glass | 3.2 mm glass with anti-reflective coating / tempered / high-transparency / low-iron content |
| Packaging | BDO: 35 modules per pallet / stackable 3 pallets high BBO: 30 modules per pallet / stackable 3 pallets high |
| Certified Test Load (snow / wind) | 5,400 Pa / 2,400 Pa |
| Impact resistance | Hailstone / Ø 25 mm / 83 km/h (51 mph) |

Tolerances of values are $\pm 5\%$. Unspecified product properties remain under full discretion of BISOL.

Solar modules can replace a variety of architectural elements, especially if they are traditionally manufactured from glass. Using solar elements in the buildings results in even more economical buildings and creative architectural designs.

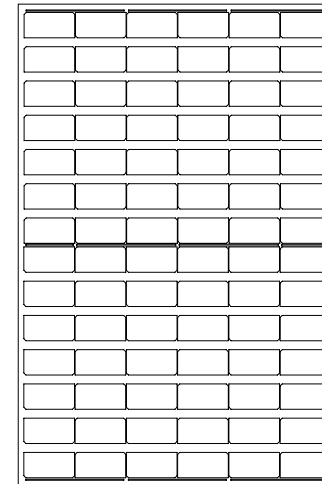


Agrivoltaic projects are a major trend in solar industry due to their multifunctionality. They produce green electricity, cover the green house's expenses while ensuring that the plants receive homogeneous light distribution and replace the expensive hail constructions.

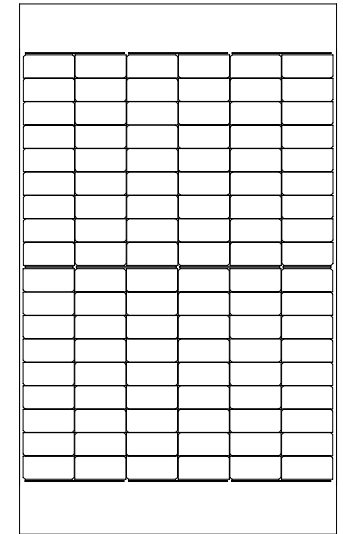
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Matrixes available



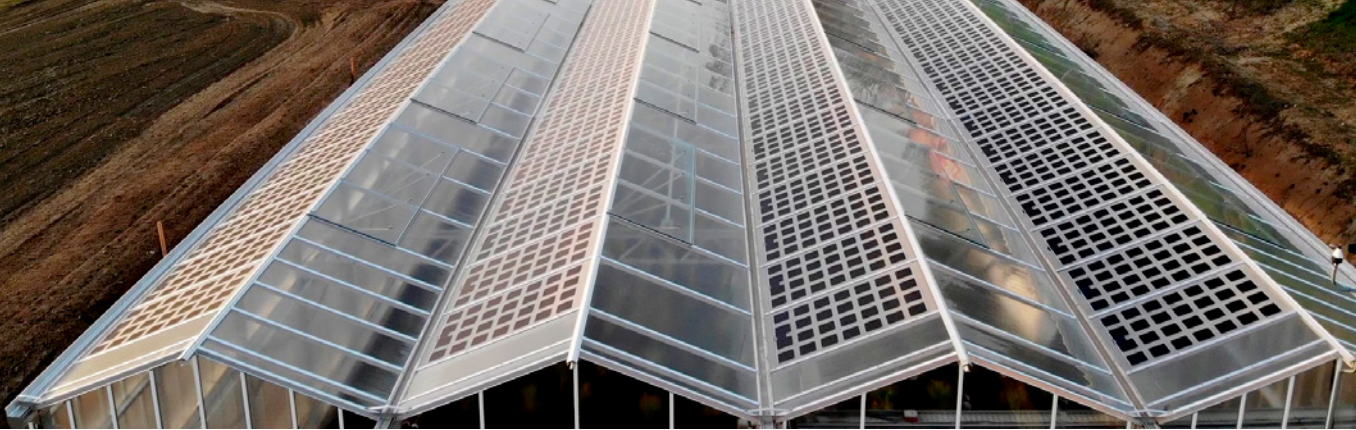
BISOL Lumina BDO module



BISOL Lumina BBO module

Did you know?

- ▶ To meet the diverse needs of solar energy consumers, BISOL offers two special matrixes providing aesthetically pleasing and cost-effective solutions for various residential and commercial projects.



BISOL Lumina

Bifacial Monocrystalline PV Modules with Transparent Backsheet

BISOL Lumina modules are extremely lightweight compared to similar products on the market. Simultaneously, they are remarkably rigid and prone to hail, snow, wind and other demanding weather conditions.



Lightweight



Rigid materials



Simple installation

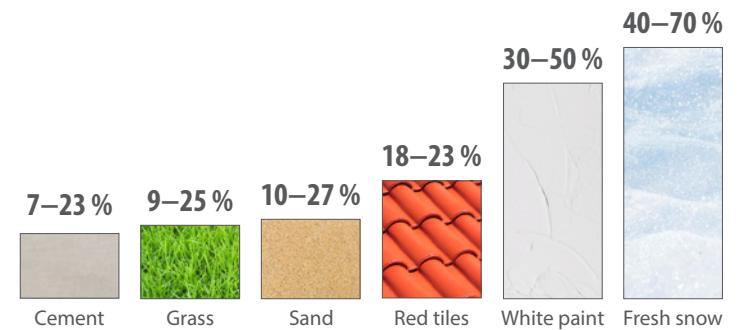


Extreme weather conditions



The albedo responsible for gaining power from the rear side depends on reflecting properties of the surface behind the module.

Approximate percentage of gained power according to different surfaces*:



The use of renewable energy sources dictates the creation of innovative solutions for their placement in the living space. While electric vehicles are slowly becoming a part of everyday life, people are increasingly considering how to integrate e-mobility with the right infrastructure.

*The exact number depends on many factors, such as the colour shade of the surface as well as the amount of diffuse sunlight, the reflected diffuse sunlight and the reflected direct sunlight.





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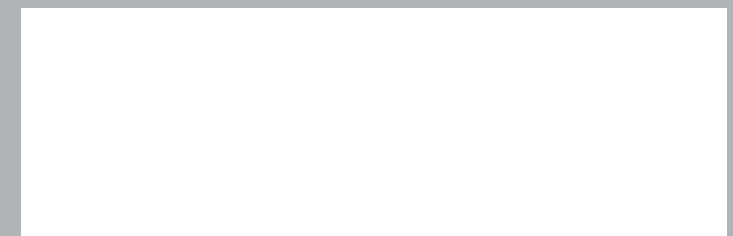
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Scan the QR code to watch our beautiful
promo video *Power & Elegance!*

Dealer information



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