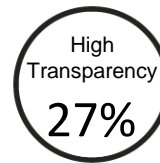
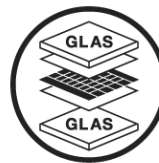


**EXCELLENT GLASS/GLASS M48  
brilliant frameless**

MONOCRYSTALLINE 215-230 WP



## Transparency and Performance

The cell matrix is optimized for light transmission and maximum performance

The optimized cell matrix enables a light transparency of 27%

Optimizes electricity production whilst preserving daylight diffusion for agricultural greenhouses and buildings

Perfect architectural integration and control of natural light contribution for verandas, pergolas, awnings and carports

30 years linear performance guarantee  
20 years product guarantee

Optional Total Care for the entire system

# EXCELLENT GLASS/GLASS 215 | 220 | 225 | 230 M48

## brilliant frameless

### Performance STC

Under standard Test Conditions STC:  
1000 W/m<sup>2</sup>; spectrum AM 1.5;  
Cell temperature 25°C  
Measurement tolerance STC:  
P<sub>mpp</sub> ±3%; I<sub>sc</sub> ±10%; U<sub>oc</sub> ±10%

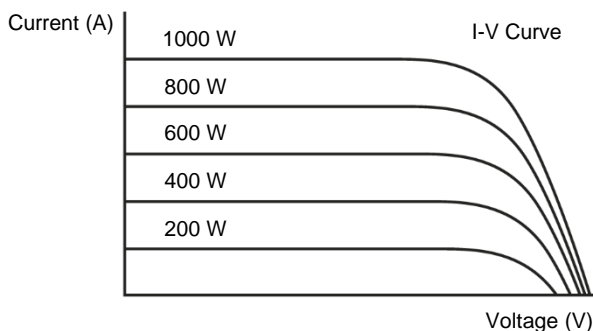
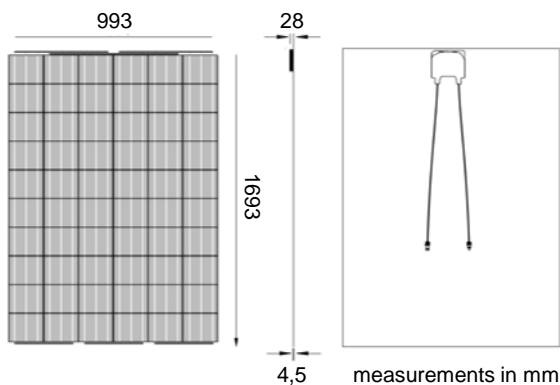
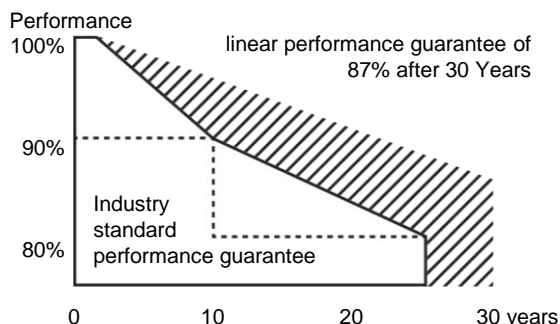
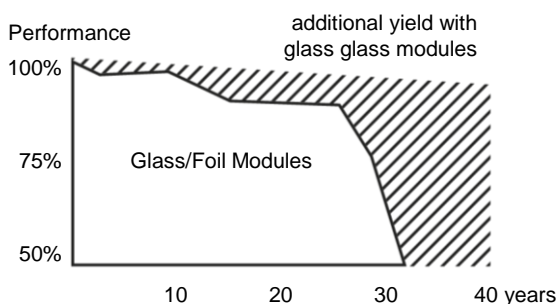
|   |       |       |       |       |
|---|-------|-------|-------|-------|
| Nominal Power P <sub>mpp</sub> (Wp)       | 215   | 220   | 225   | 230   |
| Open Circuit Voltage U <sub>oc</sub> (V)  | 30,13 | 30,54 | 30,91 | 31,16 |
| Voltage U <sub>mpp</sub> (V)              | 25,05 | 25,41 | 25,68 | 25,87 |
| Short Circuit Current I <sub>sc</sub> (A) | 9,27  | 9,36  | 9,45  | 9,58  |
| Current I <sub>mpp</sub> (A)              | 8,58  | 8,66  | 8,76  | 8,89  |
| Efficiency η (%)                          | 12,8  | 13,1  | 13,4  | 13,7  |

Reduction of module efficiency at reduction from 1000 W/m<sup>2</sup> to 200 W/m<sup>2</sup>: 4,6% ± 0,2 (relative)

### Performance NMOT

Nominal operating temperature of module  
800 W/m<sup>2</sup>, NMOT, AM 1.5

|   |       |       |       |       |
|---|-------|-------|-------|-------|
| Nominal Power P <sub>mpp</sub> (Wp)       | 165   | 169   | 173   | 177   |
| Open Circuit Voltage U <sub>oc</sub> (V)  | 27,98 | 28,36 | 28,70 | 28,93 |
| Voltage U <sub>mpp</sub> (V)              | 24,02 | 24,38 | 24,66 | 24,85 |
| Short Circuit Current I <sub>sc</sub> (A) | 7,50  | 7,57  | 7,65  | 7,75  |
| Current I <sub>mpp</sub> (A)              | 6,86  | 6,92  | 7,00  | 7,10  |



### Other Technical Specification

|                         |                            |
|-------------------------|----------------------------|
| Max. system voltage     | 1000 V                     |
| Weight                  | 20.0 ± 0.5 kg              |
| Reverse Current Load IR | 15 A                       |
| Junction box            | IP 67 with 3 bypass diodes |
| Connectors              | IP 67, MC4                 |
| Fire rating             | class C                    |
| Operating temperature   | -40°C ... +85°C            |
| Design load: snow       | 1.600 Pa *                 |
| Max test load           | 2.400 Pa                   |
| Design load: wind       | 1.600 Pa *                 |
| Max test load           | 2.400 Pa                   |

\* safety factor 1.5

### Thermal Properties

|                     |             |
|---------------------|-------------|
| TC P <sub>mpp</sub> | -0.41 %/K   |
| TC U <sub>oc</sub>  | -0.31 %/K   |
| TC I <sub>sc</sub>  | 0.045 %/K   |
| NMOT                | 45 +/- 2 °C |

### Material Used

|               |                      |
|---------------|----------------------|
| No. of cells  | 48 cells             |
| Type of cells | monocrystalline      |
| Front         | hardened solar glass |
| Frame         | n/a                  |
| Frame height  | n/a                  |

