

# CERTIFICATE

## TÜV NORD CERT GmbH

herewith declares that

### Solar Fabrik GmbH

Hermann-Niggemann-Straße 7

D-63846 Laufach

Germany

is authorized to provide the product mentioned below with the mark as illustrated:

#### Description of product (details see Annex 2):

Crystalline Silicon Terrestrial Photovoltaic (PV) Modules



Valid from: 2023-12-22

Valid until: 2027-07-03

Certification program:	P12-VA-01 Rev. 17 09.20
Certification fundamental(s):	IEC / EN 61215-1:2016; IEC / EN 61215-1-1:2016; IEC 61215-2:2016 / EN 61215-2:2017 + AC:2017 + AC:2018; IEC 61730-1:2016 / EN IEC 61730-1:2018 + AC:2018; IEC 61730-2:2016 / EN IEC 61730-2:2018 + AC:2018.
Registered No.:	44 780 23 406749 - 314R1A1M1
Manufacturer:	see Annex 1
Test Report No.:	492012710.002
File No.:	PVP11174/23P



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Consumer Products



Essen, 2023-12-22

Please also pay attention to the information stated overleaf.

**Manufacturer:**

Manufacturer 1: **Coded by debtor no. 55560544**  
Factory inspection report no.: 862010664.002

Manufacturer 2: **Coded by debtor no. 55578529**  
Factory inspection report no.: 862010732.001

Manufacturer 3: **Coded by debtor no. 55587432**  
Factory inspection report no.: 862010779.001

Manufacturer 3: **Coded by debtor no. 55594747**  
Factory inspection report no.: 862010855.001

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



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**Description of product(s):**

Module types:	<b>Double Glass PV Modules with Half-cut 210mm Mono-crystalline Silicon Solar Cells:</b> 132 cells: MS4 HC V xxx BF-DGM TP PJ (xxx=650-670, in steps of 5) 120 cells: MS4 HC V xxx BF-DGM TP PJ (xxx=590-610, in steps of 5) 108 cells: MS4 HC xxx BF-DGM IVP PJ (xxx=530-545, in steps of 5) 96 cells: MS4 HC xxx BF-DGM IVP PJ (xxx=475-490, in steps of 5) 84 cells: MS4 HC xxx BF-DGM IVP (xxx=415-425, in steps of 5) 60 cells: MS5 HC V xxx BF-DG(xxx=285-310, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	35A or 15A, refer CDF for details
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient ( $\varphi$ ):	70% $\pm$ 5%

Module types:	<b>Double Glass PV Modules with Half-cut 182mm Mono-crystalline Silicon Solar Cells:</b> 144 cells: MS4 HC xxx BF-DGM TP PJ (xxx=530-560 in steps of 5) 132 cells: MS4 HC xxx BF-DGM TP PJ (xxx=485-510 in steps of 5) 120 cells: MS4 HC xxx BF-DGM TP PJ (xxx=440-465 in steps of 5) 108 cells: MS4 HC V xxx BF-DG IVP (xxx=400-420 in steps of 5) 96 cells: MS4 HC xxx BF-DG IVP (xxx=355-370 in steps of 5) 72 cells: MS4 HC xxx BF-DG IVP (xxx=265-280 in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5



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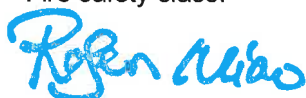
Fire safety class: Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)  
Bifaciality coefficient ( $\varphi$ ): 70%  $\pm$  5%

Module types: **Double Glass PV Modules with Half-cut 210mm TOPCon Monocrystalline Silicon Solar Cells:**  
132 cells: MS4 HC xxx BF-DGM TP PJ (xxx=660-705 in steps of 5)  
120 cells: MS4 HC xxx BF-DGM TP PJ (xxx=600-640 in steps of 5)  
60 cells: MS5 HC xxx BF-DG IS (xxx=300-320 in steps of 5)  
60 cells: MS5 HC xxx BF-DG (xxx=300-320 in steps of 5)  
Remark: xxx indicates output power from the front side only

Maximum system voltage: 1500V  
Fuse rating: 35A  
Electrical protection class: Class II  
Pollution degree: 1  
Material group: I  
Design load (positive / negative): 3600Pa / 1600Pa  
Safety factors: 1.5  
Fire safety class: Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)  
Bifaciality coefficient ( $\varphi$ ): 75%  $\pm$  5%

Module types: **Double Glass PV Modules with Half-cut 182mm TOPCon Monocrystalline Silicon Solar Cells:**  
144 cells: Mono S4 HC V xxx BF-DG (xxx=545-590 in steps of 5)  
132 cells: Mono S4 HC V xxx BF-DG (xxx=495-540 in steps of 5)  
120 cells: Mono S4 HC V xxx BF-DG (xxx=445-490 in steps of 5)  
108 cells: Mono S4 HC V xxx BF-DG (xxx=400-440 in steps of 5)  
Remark: xxx indicates output power from the front side only

Maximum system voltage: 1500V  
Fuse rating: 30A  
Electrical protection class: Class II  
Pollution degree: 1  
Material group: I  
Design load (positive / negative): 3600Pa / 1600Pa  
Safety factors: 1.5  
Fire safety class: Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)



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Bifaciality coefficient ( $\varphi$ ):	75% $\pm$ 5%
Module types:	<b>Double Glass PV Modules with Half-cut 182mm TOPCon Monocrystalline Silicon Solar Cells:</b> 108 cells: MS4 HC xxx BF-DG IVP (xxx=405-445 in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Fuse rating:	30A
Electrical protection class:	Class II
Pollution degree:	1
Material group:	I
Design load (positive / negative):	3600Pa / 1600Pa
Safety factors:	1.5
Fire safety class:	Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)
Bifaciality coefficient ( $\varphi$ ):	80% $\pm$ 5%

## Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.

Bifaciality coefficient ( $\varphi$ ) = ( $I_{sc_{rear}} / I_{sc_{front}}$ ) or ( $P_{mpp_{rear}} / P_{mpp_{front}}$ ), whichever is smaller.

The tolerance of bifaciality coefficient ( $\varphi$ ) is claimed by client.

Rated  $P_{mpp}$  power with albedo: comprehensive power of both sides, taken  $\varphi$  and albedo into consideration.

The albedo is claimed by client.



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