

CERTIFICATE

SONNEN METAL LLC

1-A, BOGATYRSKA STR.,
KYIV, 04212, UKRAINE

It is certified that:

The static study of the SONNEN METALL LLC Supporting System "SM-STV" for Photovoltaic Modules as mentioned in the attached Annex I, has been elaborated according to the basic requirements of the following regulations:

- Eurocode 0 (EN 1990): Basis of structural design
- Eurocode 1 (EN 1991): Actions on structures – General actions
- Eurocode 3 (EN 1993): Design of steel structures

Certificate number: **6191/20**

Valid until: 07/04/2025



Organization for Certification
TUV AUSTRIA HELLAS

Athens, 08/04/2020

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Annex I of the Certificate Nr. 6191/20

TYPE	APPROVAL DATE OF STUDY	STUDIER
SUPPORTING SYSTEM "SM-STV, (vertical)" FOR PHOTOVOLTAIC MODULES	07/04/2020	TECHNICAL DEPARTMENT OF SONNENMETAL COMPANY

Remarks:

1. The supporting system for PV panels, which is the subject of the study (installation with 3 modules portrait), is a product of SONNEN METAL LLC and is manufactured with S350 galvanized steel for the main components and the peripherals. The stainless steel bolts M10 are of 8.8 strength.
2. The wind and snow loads have been taken into account in accordance with Eurocode 1 "Actions on structures – General actions".
3. The seismic loads have not been taken into account.
4. The basic loads used, according to the study, are as follows:
 - Self weight of PV panels: 0.14 kN / m²
 - Wind speed Vb: 24.50 m / sec (EC1)
5. Terrain category "II", which corresponds to an area with low vegetation.
6. The snow load has been calculated according to Eurocode EN1991-1-3. The characteristic value of snow load on the ground at sea level is $s_k = 0.7 \text{ kN} / \text{m}^2$. The final calculation value after the slope correction obtained in the study is: $0.504 \text{ kN} / \text{m}^2$.
7. All components are designed for wind load, applied without eccentricity in accordance with EN1991-4. The combinations of controls are in accordance with EN 1990.
8. The check of the steel members and connections is being carried out in accordance with the foreseen in Eurocode 3 "Design of steel structures".
9. The choice of the snow, and wind loads referred to in the respective Local Regulations shall be the sole responsibility of the project designer.
10. The results from the function limit state (eg, movements and sinks of nodes and members and their relation to panel tolerances) are considered to be checked and accepted by both the designer and the manufacturer of the pv supporting system.
11. The correctness -according to EC1, EC3 etc.- of the loads combination of the study has not been checked by us.
12. The static analysis is performed uses a suitably configured numerical model of linear finite elements in space.
13. The check and certification of the study do not refer to numerical calculations verification. The project's engineer bears the sole responsibility for the study correctness and the numerical data authenticity.


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