Solar systems from Schweizer

Data sheet PV mounting system MSP-TT

Trapezoidal sheet metal roof

Read carefully before use and keep in a safe place.

All information and illustrations were up to date at the time of publication.
The current version can be downloaded at any time from the Data sheet MSP-TT.
Technical changes and errors excepted.

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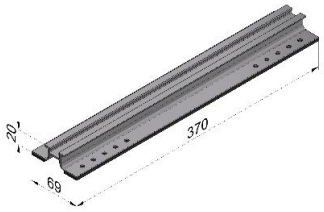
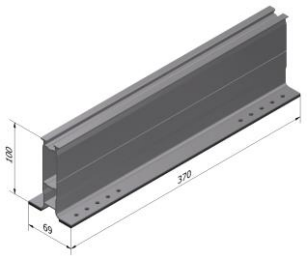
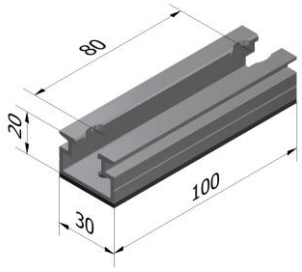
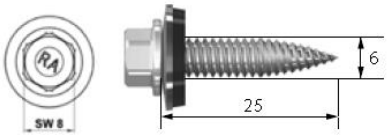
1 Basic dimensions and component materials

Trapezoidal rail MSP-TT-CHA 270 mm, High point distance 97 to 233 mm MSP-TT-CHA 370 mm, High point distance to 333 mm	EN AW-6063 T66 Pre-punched screw holes, Hole pattern: 17 mm EPDM gasket, black, pre-assembled	
Trapezoidal rail MSP-TT-CHAH 370 mm, High point distance 197 to 333 mm 100 mm Mounting	EN AW-6063 T66 Pre-punched screw holes, Hole pattern: 17 mm EPDM gasket, black, pre-assembled	
Trapezoidal rail MSP-TT-CHV 100 mm	EN AW-6063 T66 Pre-punched screw holes EPDM-Basic, black, pre-assembled 2 mm	
Trapezoidal rail MSP-TT-CHVH 100 mm 100 mm Mounting	EN AW-6063 T66 Pre-punched screw holes EPDM-Basic, black, pre-assembled 2 mm	
Thin sheet metal screw MSP-TT-TS 6x25	Screw: Bimetal A2/steel coated Sealing disc: A2 with EPDM Approval: Z-14.1-537	
Middle clamp MSP-PR-MC 28-45 mm MSP-PR-MCG 28-45 mm, conductive MSP-PR-MCB 28-45 mm, black MSP-PR-MCBG 28-45 mm, black, conductive	Clamp: EN AW-6063 T66 - EN 755-2 Screw: A2-70 - ISO 3506-1 Safety disc: PE-HD or PVC abZ Z-14.4-926	

End clamp MSP-PR-EC 28-45 mm MSP-PR-ECB 28-45 mm MSP-PR-ECG 28-45 mm, conductive MSP-PR-ECBG 28-45 mm, black, conductive	Clamp: EN AW-6063 T66 - EN 755-2 Screw: A2-70 - ISO 3506-1 Safety disc: PE-HD or PVC Nut: A4-70 - ISO 3506-2 abZ Z-14.4-926	

2 Design resistance of the components (ultimate limit state)

To verify the resistance values of trapezoidal sheet metal roof systems of the type MSP-TT-CHA and MSP-TT-CHAH, the calculation values of all components must be considered individually:

– Rated values of the roof structure in accordance with the relevant building regulations – Design value of the trapezoidal sheet in relation to EN 1993-1-3 and DIN 18807 – Rated value of the module according to manufacturer's specifications	– by the customer
– MSP-TT-TS 6x25 thin sheet metal screw for a single, screwed fixing point, see 2.1 – MSP-TT-CH-CHA trapezoidal rail, see 2.2 – Middle clamp MSP-PR-MC/G & MSP-PR-MCB/G, see 2.3 – End clamp MSP-PR-EC/G & MSP-PR-ECB/G, see 2.4	– According to this data sheet and the Swiss S.P.T. Software

The component with the lowest resistance values is decisive for the performance of the application .

All resistance values were calculated in accordance with the following standards and approvals:

- DIN IN 1990 (EC 0)
- DIN EN 1999-1-1 (EC 9)
- abZ Z-14.4-926
- abZ Z-14.1-537 Annex 3.2.22 and 3.1.31

The resistance values only apply if the complete MSP-TT system from Schweizer is used and the installation is carried out in accordance with the installation instructions for the PV mounting system for trapezoidal sheet metal roofs MSP-TT.

2.1 MSP-TT-TS 6x25 thin sheet metal screw

For this application, the design values of the load-bearing capacity shown in Tables 1 to 3 can be assumed under the following conditions:

- Trapezoidal sheet metal roof made of: steel S235 - EN 10025, steel S280GD or S320GD - EN 10346, aluminium $f_{(u,min)} \geq 165$ N/mm2.
- The rated values given in Tables 1 to 3 apply to a single fixing point, i.e. one screw.
  - Design value for individual fixing points on trapezoidal steel sheet: Table 1.
  - Design value for individual fixing points on aluminium trapezoidal sheet: Tables 2 and 3.
- For the effect of pull-out and shear should be $\frac{N_{Ed}}{N_{Rd}} + \frac{V_{Ed}}{V_{Rd}} \leq 1$ applied.
- The pull-through design value of the screw head is irrelevant, the fastening is limited by the pull-out value of the screw.

Table 1 :
Rated values of the load-bearing capacity of the thin sheet metal screw MSP-TT-TS 6x25 in steel trapezoidal sheet

Trapezoidal sheet thickness	0.50	0.63	0.75	0.88	1
Rated value Extract N_{Rd} [kN].	0.59	0.89	1.11	1.41	1.68
Rated value Shear V_{Rd} [kN]	0.77	1.56	2.16	2.80	3.38

Table 2 :
Rated values of the load-bearing capacity of the thin sheet metal screw MSP-TT-TS 6x25 in aluminium trapezoidal sheet with Rm ≥165 N/mm^2

Trapezoidal sheet thickness [mm]	0.6	0.7	0.8	1	1.2
Rated value Extract N_{Rd} [kN].	0.35	0.44	0.53	0.71	0.85
Rated value Shear V_{Rd} [kN]	0.46	0.74	0.78	1.26	1.44

Table 3 :
Rated values of the load-bearing capacity of the thin sheet metal screw MSP-TT-TS 6x25 in aluminium trapezoidal sheet with Rm ≥ 215 N/mm$^{(2)}$

Trapezoidal sheet thickness [mm]	0.6	0.7	0.8	1	1.2
Rated value Extract N_{Rd} [kN].	0.46	0.58	0.69	0.92	1.11
Rated value Shear V_{Rd} [kN]	0.60	0.89	1.02	1.65	1.87

2.2 MSP-TT-CHA and MSP-TT-CHAH trapezoidal rail

A single module clamp per rail can be installed within the permitted span (see Fig. 1) under the following conditions.

Maximum bead spacing: s max = 333 mm

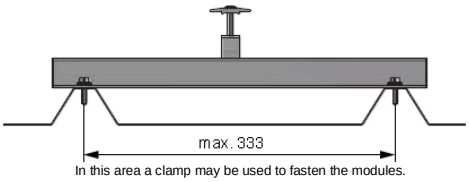


Figure 1: Clamping area on trapezoidal rail

2.3 MSP-TT-CHV and MSP-TT-CHVH trapezoidal rail

The minimum bead width must not be less than **20 mm in** order to ensure the best possible support for the profile.

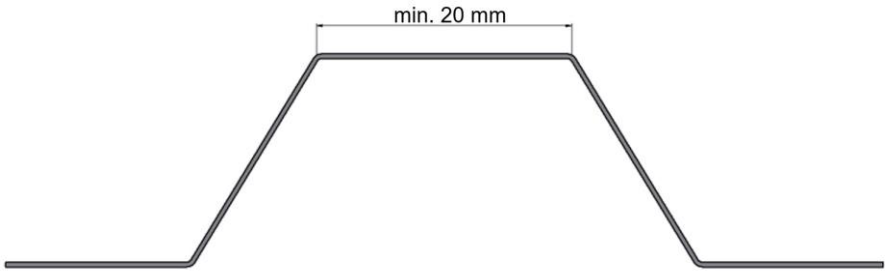


Figure 2: Illustration of the minimum bead width

Table 4 :
Rated values of the load-bearing capacity of the MSP-TT-CHV and CHA trapezoidal rail.

	MSP-TT-CHV 100 mm	MSP-TT-CHVH 100 mm	MSP-TT-CHA 270 mm	MSP-TT-CHA 370 mm	MSP-TT-CHAH 370 mm
Rated value suction N_{Rd} [kN].	-4.35	-4.35	-2.86	-2.00	-2.00
Rated value pressure N_{Rd} [kN]	7.58	7.58	2.86	2.00	2.00
Rated value lateral force V_{Rd} [kN].	0.67	0.67	4.36	3.61	3.61

2.4 Centre clamp MSP-PR-MC/G & MSP-PR-MCB/G

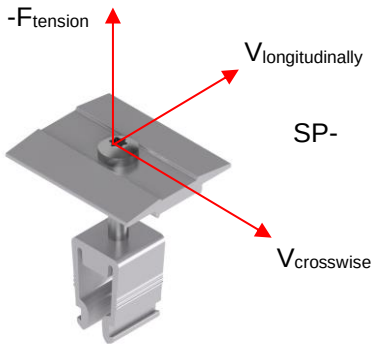


Table 5 :
Design values for the load-bearing capacity of the centre clamp PR-MC/G & MSP-PR-MCB/G in accordance with abZ Z-14.4-926

Rated resistance $F_{tension}$ [kN].	-6.14
Rated resistance crosswise $V_{crosswise}$ [kN]	2.20
Rated resistance $V_{longitudinally}$ [kN]	2.04

2.5 End clamp MSP-PR-EC/G & MSP-PR-ECB/G

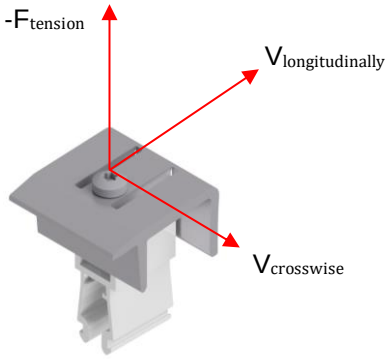


Table 6 :
Rated values for the load-bearing capacity of the end clamp MSP-PR-EC/G & MSP-PR-ECB/G according to abZ Z-14.4-926

Rated resistance $F_{tension}$ [kN].	-3.76
Rated resistance $V_{crosswise}$ [kN]	1.33
Rated resistance $V_{longitudinally}$ [kN]	1.93