

Solar systems by Schweizer

Data sheet – PV-Mounting system

Trapezoidal sheet metal roof MSP-TT



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1 Basic dimensions and component materials

<p>Trapezoidal rail MSP-TT-CHA 270 mm, High point distance 97 to 233 mm MSP-TT-CHA 370 mm, centre-to-centre distance up to 333 mm</p>	<p>EN AW-6063 T66 Pre-punched screw holes, Hole pattern: 17 mm EPDM seal, black, pre-assembled</p>	
<p>Trapezoidal rail MSP-TT-CHV 100 mm</p>	<p>EN AW-6063 T6 Pre-punched screw holes, EPDM-Basic, black, pre-assembled 2mm</p>	
<p>Thin sheet metal screw MSP-TT-TS 6x25</p>	<p>Screw: Bimetal A2/steel specially coated Sealing disc: A2 with EPDM Approval: Z-14.1-537</p>	
<p>Centre 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</p>	<p>Clamp EN A-6063 T66 - EN 755-2 Screw A2-70 - ISO 3506-1 Locking disc PE-HD or PVC abZ Z-14.4-926</p>	
<p>End clamp MSP-PR-EC 28-45 mm MSP-PR-ECB 28-45 mm</p>	<p>Clamp EN AW-6063 T66 - EN 755-2 Screw A2-70 - ISO 3506-1 Locking disc PE-HD or PVC Bolt: A4-70 - ISO 3506-2 abZ Z-14.4-926</p>	

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2 Design resistance of the components (Limit state of load-bearing capacity)

In order to verify the resistance values of trapezoidal roof systems of the type MSP-TT-CHA, the rated resistances of each component must be considered individually:

<ul style="list-style-type: none"> – Rated resistance of the roof structure in accordance with the relevant building regulations – Rated resistance of the trapezoidal sheet metal in relation to EN 1993-1-3 and DIN 18807 – Rated resistance of the module according to manufacturer's specifications 	<ul style="list-style-type: none"> – by the customer
<ul style="list-style-type: none"> – 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 – Centre clamp MSP-PR-MC/MCB, see 2.3 – End clamp MSP-PR-EC/ECB, see 2.4 	<ul style="list-style-type: none"> – According to this data sheet and the Schweizer SPT software

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

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

- DIN EN 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 PV mounting system trapezoidal roof MSP-TT.

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

For this application, the design values for 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 $f_{u,min} \geq 165 \text{ N/mm}^2$.
- The design values given in tables 1 to 3 are valid for 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 $\frac{N_{Ed}}{N_{Rd}} + \frac{V_{Ed}}{V_{Rd}} \leq 1$ needs to be applied.
- The pull-through rated resistance of the screw head is never relevant, the fastening is limited by the pull-out value of the screw.

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Table 1:

Design value of the load-bearing capacity of the MSP-TT-TS 6x25 thin sheet screw in steel in accordance with abZ Z-14.1-537 Annex 3.2.22.

Thickness of trapezoidal sheet [mm]	0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25	1.50	2.00
Rated resistance extract N_{Rd} [kN]	0.65	0.74	0.89	1.11	1.41	1.68	1.80	1.92	1.92	1.92
Rated resistance Shear V_{Rd} [kN]	0.62	0.68	0.79	0.95	1.28	1.65	1.81	1.97	2.29	2.29

Table 2:

Dimensioning of the load-bearing capacity of the MSP-TT-TS 6x25 thin sheet screw in aluminium with $R_m \geq 165$ N/mm² in accordance with abZ Z-14.1-537 Annex 3.1.31.

Thickness of trapezoidal sheet [mm]	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.50	2.00
Rated value extract N_{Rd} [kN]	0.29	0.38	0.48	0.57	0.64	0.71	0.85	1.12	1.12
Rated value shear V_{Rd} [kN]	0.47	0.58	0.68	0.78	1.02	1.26	1.46	1.76	1.76

Table 3:

Rated value of the load-bearing capacity of the MSP-TT-TS 6x25 thin sheet screw in aluminium with $R_m \geq 215$ N/mm² in accordance with abZ Z-14.1-537 Annex 3.1.31.

Thickness of trapezoidal sheet [mm]	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.50	2.00
Rated value extract N_{Rd} [kN]	0.38	0.50	0.62	0.74	0.83	0.92	1.11	1.47	1.47
Rated value shear V_{Rd} [kN]	0.62	0.75	0.89	1.02	1.34	1.65	1.90	2.29	2.29

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2.2 MSP-TT-CHA 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: $s_{\max} = 333 \text{ mm}$

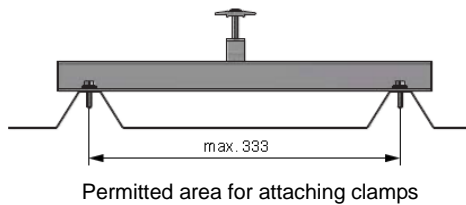


Figure 1: Clamping area on trapezoidal rail

2.3 MSP-TT-CHV Trapezoidal rail

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

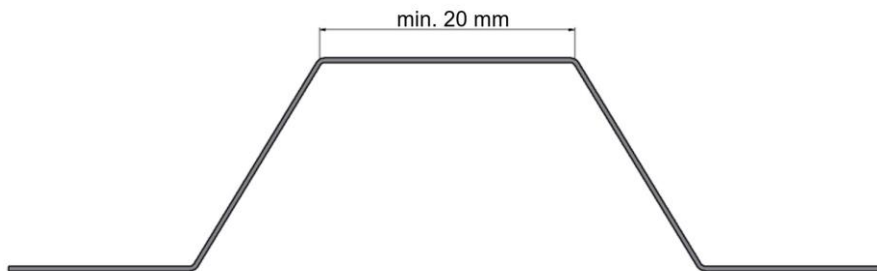


Figure 3: Illustration of the minimum bead width

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Table 4:

Rated value of the load-bearing capacity of the MSP-TT-CHA and CHV trapezoidal rail.

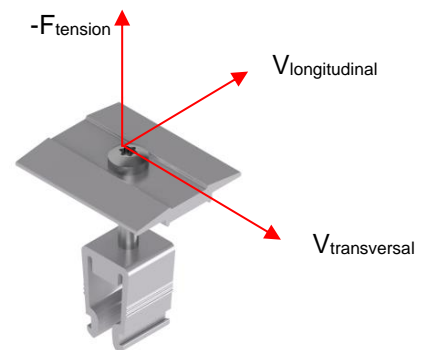
	MSP-TT-CHV 100 mm	MSP-TT-CHA 270 mm	MSP-TT-CHA 370 mm
Rated resistance suction N_{Rd} [kN] _{Rd}	-4.35	-2.86	-2.00
Rated resistance suction to pressure N_{Rd}	7.58	2.86	2.00
Rated resistance shear force VRd [kN] _{Rd}	0.67	4.36	3.61

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

Table 5:

Rated resistance of the load-bearing capacity of the centre clamp MSP-PR-MC/G & MSP-PR-MCB/G in accordance with abZ Z-14.4-926

Rated resistance tension $F_{tension}$ [kN]	-6.14
Rated resistance shear force $V_{transversal}$ [kN]	2.20
Rated resistance longitudinal $V_{longitudinal}$ [kN]	2.04



2.5 End clamp MSP-PR-EC/B

Table 6:

Rated value of the load-bearing capacity of the end clamp MSP-PR-EC/B according to abZ Z-14.4-926

Rated resistance tension $F_{tension}$ [kN]	-3.76
Rated resistance transverse $V_{transverse}$ [kN]	1.33
Rated resistance longitudinal $V_{longitudinal}$ [kN]	1.93

