Solar systems of Schweizer:
Datasheet – MSP-TT
metal roof PV mounting system.

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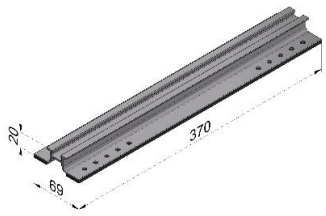
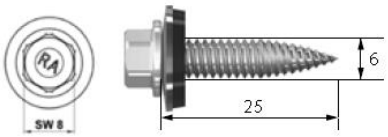
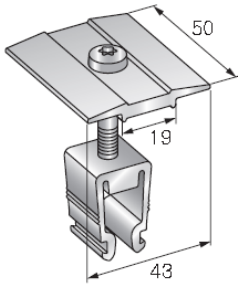
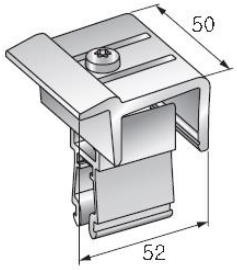
1 Basic dimensions and component materials

Trapezoidal track MSP-TT-CHA 270 mm Distance btw. high points 97 mm to 233 mm MSP-TT-CHA 370 mm Distance btw. high points up to 333 mm	EN AW-6063 T66 Pre-punched screw passages, hole grid: 17 mm EPDM-Basic, black, pre-assembled	
Trapezoidal track MSP-TT-CHV 100 mm	Pre-punched screw passages, EPDM-Basic, black, pre-assembled	
Thin metal sheet screw MSP-TT-TS 6x25	Screw: Bimetal A2/steel special coated sealing washer: A2 with EPDM Approval Z-14.1-537	
Middle clamp MSP-PR-MC 30-50 mm MSP-PR-MCG 30-50 mm grounding MSP-PR-MCB 30-50 mm, black MSP-PR-MCBG 30-50 mm, black, grounding	Mounting clamp EN AW-6063 T66 - EN 755-2 Grounding strap A4 Screw: A2-70 - ISO 3506-1	
End clamp MSP-PR-EC 30-50 mm MSP-PR-ECB 30-50 mm, black	Mounting clamp EN AW-6063 T66 - EN 755-2 Screw: A2-70 - ISO 3506-1	

2 Design resistance of the components (ultimate limit state)

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

– Rated values of the roof construction according to the corresponding building regulations – Rated value of the trapezoidal sheet in relation to EN 1993-1-3 and DIN 18807 – Rated value of the PV module according to manufacturer's specifications	– Evaluation by the customer

– MSP-TT-TS 6x25 thin metal screw for a single, screwed fixing point, see 2.1 – MSP-TT-CH-CHA trapezoidal track, see 2.2 – Middle clamp MSP-PR-MC/MCB, see 2.3 – End clamp MSP-PR-EC/ECB, see 2.4	– According to this data sheet and the proMSP software from Schweizer

The feature with the lowest load capacity values is decisive for the performance of the application.
All mechanical strength values are calculated in accordance with the following regulations and standards:

- DIN EN 1990:2010-12 (EC 0)
- DIN EN 1999-1-1:2010-05 (EC 9)
- VDI 2230 Blatt 1:2003-02 (VDI 2230)
- DIN EN 1995-1-1:2012-12 (EC 5)
- abZ Z-14.1-537 Appendix 3.2.22 and 3.1.31

The mechanical strength values only apply if the complete MSP-TT system from Schweizer is used and the installation is carried out according to the installation instructions for the MSP-TT metal roof PV mounting system.

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

For this application, the rated values for the bearing strength 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 are valid for a single fixing point, i.e. one screw.
  - Rated value for single fixing point on trapezoidal steel sheet: Table 1.
  - Rated value for single fixing point on trapezoidal aluminium sheet: Tables 2 and 3.
- For the loads of lift-off and shear the following equation shall be $\frac{N_{Ed}}{N_{Rd}} + \frac{V_{Ed}}{V_{Rd}} \leq 1$ applied:
- The rated pull-through value of the screw head is never relevant, as the fastening is limited by the lift-off value of the screw.
- The total rated value of the load capacity of an application with the MSP-TT trapezoidal sheet metal system is limited by the rated value of one fastening per bead with 2 screws.

Table 1:
Rated value of the load capacity of the MSP-TT-TS 6x25 thin sheet steel screw in steel according to Z-14.1-537 Annex 3.2.22.

Thickness metal sheet [mm]	0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25	1.50	2.00
Rated value Lift-off N_{Rd} [kN]	0.65	0.74	0.89	1.11	1.41	1.68	1.80	1.92	1.92	1.92
Rated value 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:
Rated value of the load capacity of the MSP-TT-TS 6x25 thin sheet screw in aluminium with Rm ≥165 N/mm2 according to abZ Z-14.1-537 Annex 3.1.31.

Thickness metal sheet [mm]	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.50	2.00
Rated value Lift-off 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 capacity of the MSP-TT-TS 6x25 thin sheet aluminium screw with Rm ≥ 215 N/mm2 according to abZ Z-14.1-537 Appendix 3.1.31.

Thickness metal sheet [mm]	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.50	2.00
Rated value Lift-off 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

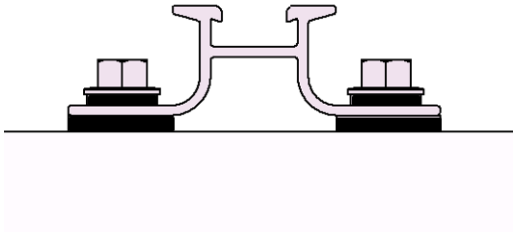
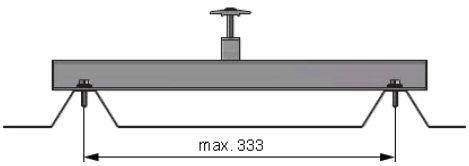


Figure 1: Fixing point with two screws

2.2 MSP-TT-CHA Trapezoidal track

A single module clamp per rail can be installed within the permitted span (see Fig. 2) under the following conditions.

Maximum bead spacing: s max= 333 mm



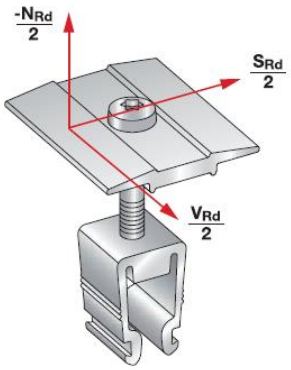
Permitted span for the installation of the module clamps

Figure 2: Clamping area on trapezoidal rail

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

	MSP-TT-CHV 100 mm	MSP-TT-CHA 270 mm	MSP-TT-CHA 370 mm
Rated value lift-off N_{Rd} [kN]	-4.35	-2.86	-2.00
Rated value pressure N_{Rd} [kN]	7.58	2.86	2.00
Rated value shear V_{Rd} [kN]	0.67	4.36	3.61

2.3 MSP-PR-MC / -MCG Middle clamp

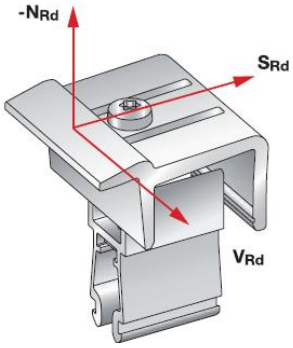


Middle clamps can be stressed with $N_{Rd/2}$ and $V_{Rd/2}$ on each side of the terminal.

Table 5:
Rated values of the load carrying capacity of the middle clamp MSP-PR-MC.

	MSP-PR-MC
Rated value lift-off N_{Rd} [kN]	-5.17
Rated value pressure N_{Rd} [kN]	1.29
Rated value shear V_{Rd} [kN]	1.29

2.4 MSP-PR-EC End clamp



End clamps can only be stressed with $N_{Rd/2}$ and $V_{Rd/2}$.

Table 6:
Rated values of the load carrying capacity of the end clamp MSP-PR-EC.

	MSP-PR-EC
Rated value lift-off N_{Rd} [kN]	-1.99
Rated value pressure N_{Rd} [kN]	0.51
Rated value shear V_{Rd} [kN]	0.51