



**MOUNTING SYSTEMS
FOR SOLAR
INSTALLATIONS**
PRODUCT RANGE 2009

**DIE TRAGENDE KRAFT
THE SUPPORTING FORCE**

MOUNTING SYSTEMS FOR SOLAR INSTALLATIONS

CONSULTATION, PLANNING, STATICS, INSTALLATION AND MAINTENANCE

PRODUCT RANGE 2009

DATE: 01/2009 · SUBJECT TO AMENDMENT



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The small solar lexicon

Photovoltaics

Photovoltaics is defined as the direct conversion of radiation energy (predominantly solar radiation) into electrical energy. It has been in use ever since it was first adopted for supplying energy to space satellites from solar cells in 1958. It is now used throughout the world to supply electrical power on roof surfaces, parking meters, sound-absorbing walls and open spaces. The name is made up of two parts: *photos* – the Greek word for light – and *Volta* – after Alessandro Volta, a pioneer in electrical technology. Photovoltaics forms part of the extensive area of solar technology which also includes other technical utilisations of solar energy.

Potential

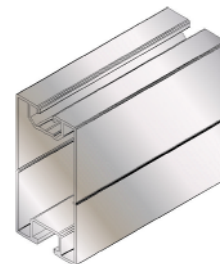
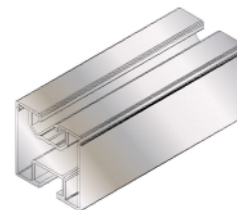
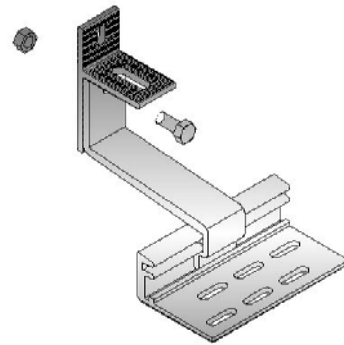
The potential which can be achieved is very high: Despite the apparently unfavourable conditions in Germany, using the technology which is available today, approximately 2% of the total area of the country is theoretically sufficient to yield enough electrical energy to meet the total annual requirements of the country. The objection that the area in Central Europe would not be sufficient to support a significant proportion of photovoltaics for energy production is therefore not tenable. Also, the required surface area could be found by utilising previously built structures (mainly roofs) without building over new ground. This theoretical evaluation of 100% coverage by photovoltaics does not represent the aim of implementation but merely serves to show the magnitude of the surface requirement. In the long term, therefore, photovoltaics can make a significant contribution to climate protection and the saving of resources, even in Germany.

Remuneration for the production of small electricity inflows

The minimum remuneration for solar plants being installed in 2009[4] [2008/2007/2006/2005/2004] is as follows:

- in general, e.g. on open spaces, 31.94 [35.49/37.96/40.6/43.4/45.7] eurocent per kilowatt hour inflow (kWh),
- on a building or a sound protection wall up to and including 30 kW, 43.01 [46.75/49.21/51.80/54.53/57.4] eurocent/kWh inflow,
- on a building or a sound protection wall greater than 30 kW, 43.01 [44.48/46.82/49.28/51.87/54.6] eurocent/kWh inflow and
- on a building or a sound protection wall greater than 100 kW, 39.59 [43.99/46.30/48.74/51.30/54.0] eurocent/kWh inflow.

The remuneration is made up proportionately as follows: With a roof system generating a peak power of 40 kW, the remuneration for 30 kW is 46.75 eurocent/kWh and for the remaining 10 kW, the remuneration is 44.48 eurocent/kWh.



Terms of shipment

We deliver small parts / pallet goods within Germany from 150.00 euro upwards free of charge.

Please note that you are responsible for unloading long items from the lorry. Please prepare your storage area or construction site accordingly. If it is not possible to deliver long items because the recipient is absent, we retain the right to invoice again for another delivery. Please supply a telephone number, particularly when the delivery is to a construction site.

We deliver long items such as mounting rails at 6.1 m from our outside storage area in Bitterfeld. The freight costs are calculated according to the table below:

Freight rates inside Germany per 100 kg								
	Minimum each dispatch	up to 500 kg	501-1,000 kg	1001-2,000 kg	2001-3,000 kg	3001-5,000 kg	5001-10,000 kg	10001-15,000 kg
up to 50 km	59.80 €	27.91 €	20.29 €	11.90 €	7.15 €	4.39 €	2.65 €	1.83 €
51-75 km	59.80 €	27.91 €	20.29 €	11.92 €	8.27 €	5.42 €	3.29 €	2.28 €
76-100 km	61.10 €	29.91 €	21.74 €	12.87 €	9.09 €	6.41 €	4.16 €	2.89 €
101-125 km	62.40 €	32.46 €	23.63 €	14.18 €	10.30 €	6.94 €	5.12 €	3.51 €
126-150 km	63.70 €	34.16 €	24.92 €	15.15 €	10.65 €	7.77 €	5.16 €	3.99 €
151-200 km	65.00 €	36.73 €	26.75 €	16.35 €	12.21 €	8.52 €	6.25 €	4.85 €
201-250 km	66.30 €	39.47 €	28.78 €	17.76 €	13.48 €	9.17 €	7.28 €	5.86 €
251-300 km	67.60 €	41.11 €	29.97 €	18.54 €	14.16 €	9.39 €	7.55 €	6.64 €
301-350 km	70.20 €	45.03 €	32.92 €	20.66 €	16.06 €	9.93 €	7.90 €	6.75 €
351-400 km	71.50 €	46.53 €	33.98 €	21.35 €	16.65 €	10.83 €	8.62 €	7.20 €
401-450 km	74.10 €	47.97 €	35.09 €	22.15 €	17.42 €	11.09 €	8.71 €	7.85 €
451-500 km	75.40 €	48.75 €	36.00 €	22.80 €	17.94 €	11.45 €	9.11 €	8.29 €
501-600 km	78.00 €	50.17 €	36.74 €	23.31 €	18.45 €	12.64 €	10.08 €	9.18 €
601-700 km	80.60 €	50.36 €	36.93 €	23.54 €	18.71 €	13.64 €	10.89 €	9.92 €
from 701 km upwards	85.80 €	51.19 €	37.70 €	24.15 €	19.32 €	14.99 €	12.03 €	10.97 €

Example invoice. dispatch of long items

Dispatch of 100 mounting rails 40 x 40 to Munich:

- Weight of mounting rail 40 x 40 = 921 grams / metre
- 100 rails at 6.1 metre therefore weigh 561.81 kg (calculation always to the nearest hundred)
- Distance Bitterfeld – Munich = 460 km
- Freight rate 36.00 euro / 100 kg
- Freight costs = 216.00 euro

Delivery times / lead times

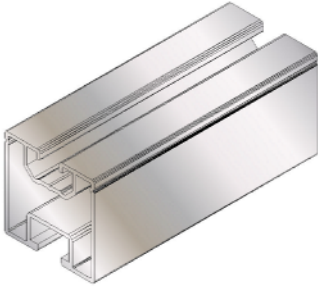
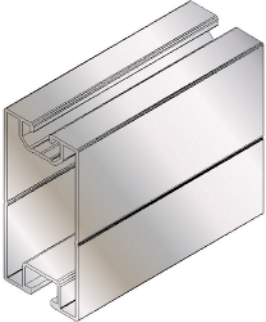
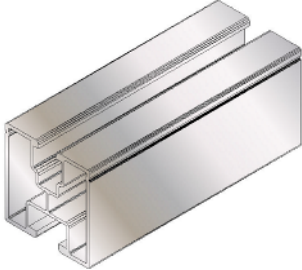
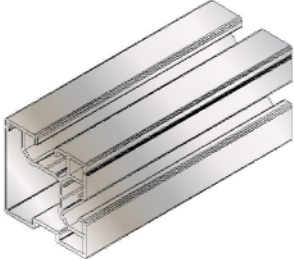
Small parts from the warehouse at Wuppertal:

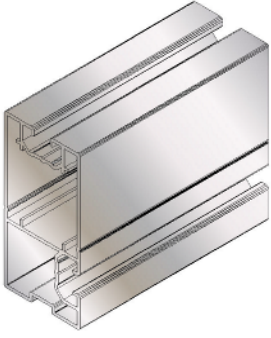
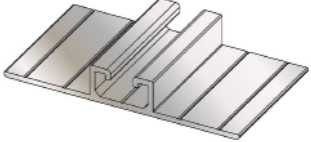
- Order input up to 12:00: Ready for dispatch on the same day
- Dispatch by parcel post (ordinary lead time 24 hours, maximum 72 hours) or courier (ordinary lead time 24 hours, maximum 72 hours)
- Extra charge for dispatch by express service on enquiry. secure dispatch arriving on the following day

Long items from warehouse at Bitterfeld

- Dispatch is usually one day after submission of the order with a maximum lead time of 48 hours

1. Rail system

1.1. Mounting rails				
Item no.	Figure	Item	Comments	Price
9664-WASI 1		Mounting rail 40 x 40 mm	Length: 6.100 mm Span width: 1.6 m Connection below: DIN 933 M10 (length according to customer requirement) Connection top: Sliding block M8 Data sheet	Anodised also available from stock. Price on enquiry 921 g/m
9664-WASI 2		Mounting rail 80 x 40 mm	Length: 6.100 mm Span width: 3.2 m Connection below: DIN 933 M10 (length according to customer requirement) Connection top: Sliding block M8 Data sheet	Anodised also available from stock. Price on enquiry 1.253 g/m
9664-WASI 3		Mounting rail 40 x 40 mm	Length: 6.100 mm Span width: 1.6 m Connection below: DIN 933 M10 (length according to customer requirement) Connection top: Square nuts. M8 Data sheet	Anodised also available from stock. Price on enquiry 910 g/m
9664-WASI 15		Mounting rail 40 x 40 mm	Length: 6.100 mm Span width: 1.6 m Connection at the side: Sliding block M8 Connection top: Sliding block M8 Data sheet	Anodised also available from stock. Price on enquiry 923 g/m

1.1. Mounting rails				
Item no.	Figure	Item	Comments	Price
9664-WASI 16		Mounting rail 80 x 40 mm	Length: 6.100 mm Span width: 3.2 m Connection at the side: Sliding block M8 Connection top: Sliding block M8 Data sheet	Anodised also available from stock. Price on enquiry 1.440 g/m
9664-WASI 31		Trapezoidal rail	Length: depending on requirements The profile can be bolted directly to the trapezoidal sheet. Top channel for sliding block M8	Price on enquiry 703 g/m
We are happy to send you structural calculations on request.				

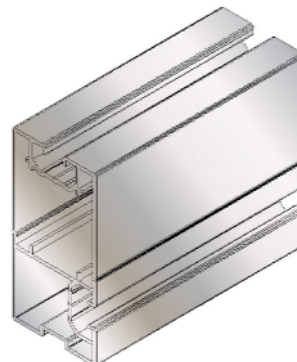
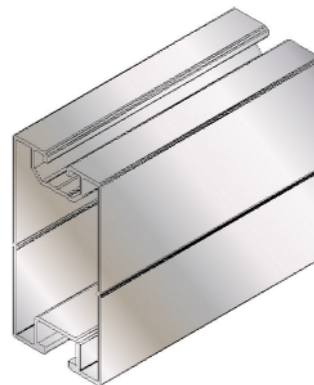
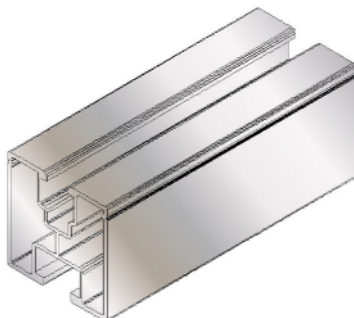
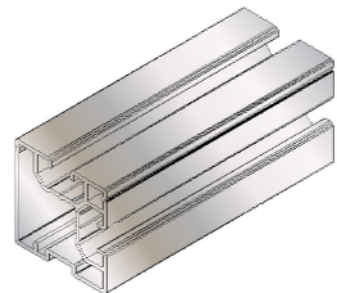
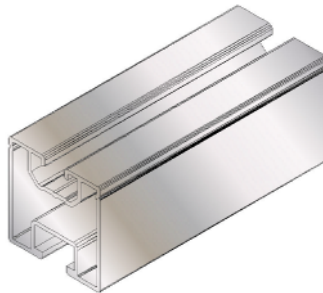
1.2. Sliding block				
Item no.	Figure	Item	Comments	Price
9431-120901		Sliding block Swivel	for M8 VE = 100 pieces ALUMINIUM Ball from A2	On enquiry

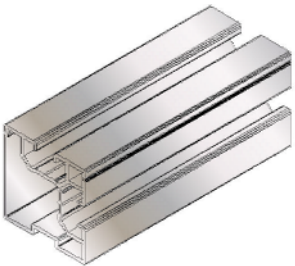
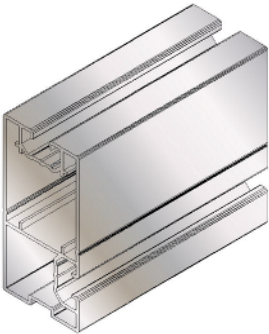
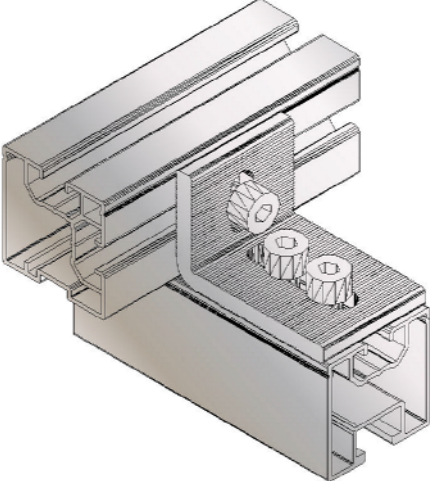
1.3. Made-to-order mounting rails

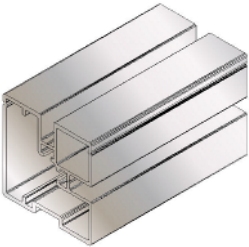
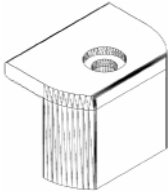
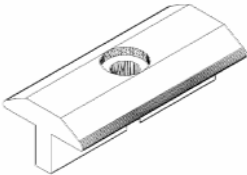
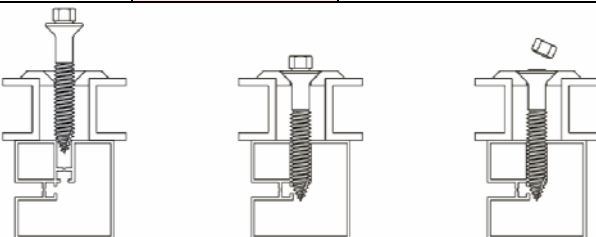
Your item number can be placed here!

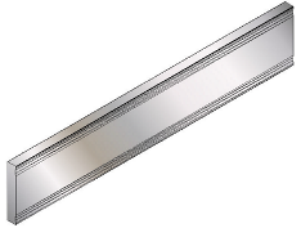
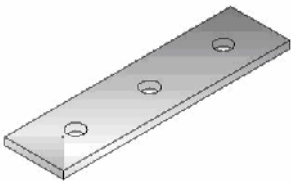
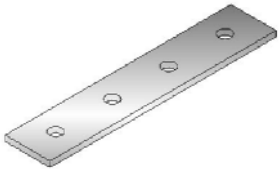
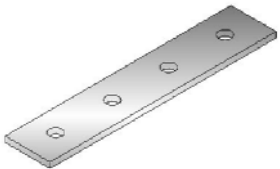
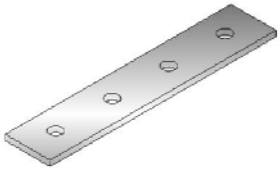
We can supply any profile imaginable, even according to your drawing.

Please enquire!

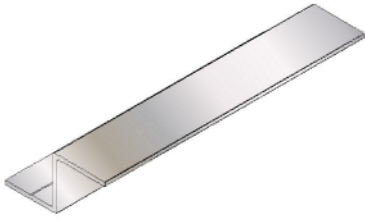
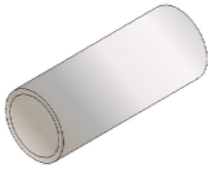


1.4. Simple cross bracing				
Item no.	Figure	Item	Comments	Price
9664-WASI 15		Mounting rail 40 x 40 mm for lateral fastening	Length: 6.100 mm Span width: 1.6 m Connection at the side: Sliding block M8 Connection top: Sliding block M8 <i>For horizontal laying with bracket 9701-WASI 14</i> Data sheet	Anodised also available from stock. Price on enquiry
9664-WASI 16		Mounting rail 80 x 40 mm	Length: 6.100 mm Span width: 3.2 m Connection at the side: Sliding block M8 Connection top: Sliding block M8 <i>For horizontal laying with bracket 9701-WASI 14</i> Data sheet	Anodised also available from stock. Price on enquiry
9701-WASI 14		Cross bracing connection bracket	Mounting 9664-WASI15 or WASI16 on 9664-WASI1. WASI2 or WASI3 with 3 sliding blocks and screws DIN 912-2-8*16 Data sheet	On enquiry
				

1.5. "SUPER-EASY MODULAR SYSTEM" mounting solution				
Item no.	Figure	Item	Comments	Price
9664- WASI 22		Mounting rail 40 x 40 mm	Length: 6.100 mm Span width: 1.6 m Bolted using special tamper-proof shear bolt Data sheet	On enquiry Available from approx. July 2009
9742- WASI 22		End clamp	For security screws Please specify module height	On enquiry Available from approx. July 2009
9745- WASI 22		Middle clamp	For security screws	On enquiry Available from approx. July 2009
9815- WASI 22		Security screw with shear head	For the WASI 22 product range	On enquiry Available from approx. July 2009
				

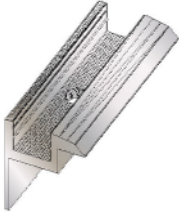
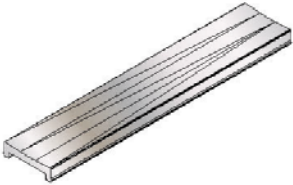
1.6. Profile connectors				
Item no.	Figure	Item	Comments	Price
9751-WASI12		Profile connectors 200 mm	for mounting rails 9664-WASI 1/3/15/22 They also require 4 self-drilling screws / connectors for fastening Data sheet	On enquiry
9751-WASI 18		Profile connector slide-in 200 mm	for mounting rails 9664-WASI 1/3/15/16 Data sheet	On enquiry
9558-2-144*40		Profile connector 3-hole 144 x 40 x 5 mm Round hole M10 A2	for mounting rail WASI 2 3 x hex screws DIN 933 M10*20 + flange nuts with serration 9345-2-10 required	On enquiry
9555-2-200*30		Profile connector 4-hole 200 x 30 x 4 mm Round hole M8 Stainless steel A2	for mounting rails 4 x hammerhead screws WS9420 M8x20 + flange nuts with serration 9345-2-8 required	On enquiry
9556-2-200*35		Profile connector 4-hole 200 x 35 x 4 mm Round hole M8 Stainless steel A2	for mounting rails 4 x hammerhead screws WS9420 M8x20 + flange nuts with serration 9345-2-8 required	On enquiry
9557-2-200*40		Profile connector 4-hole 200 x 40 x 5 mm Round hole M8 Stainless steel A2	for mounting rails 4 x hammerhead screws WS9420 M8x20 + flange nuts with serration 9345-2-8 required	On enquiry

2. Accessories made of aluminium

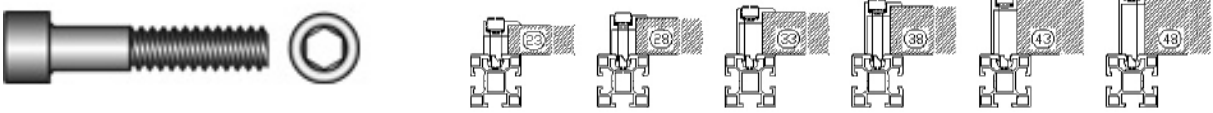
Item no.	Figure	Item	Comments	Price
9671-40*40*3		Angle profile ALU 40*40*3	Length: 6.05 metres 40 x 40 x 40 x 3 mm from stock Other lengths available on enquiry.	On enquiry
9671		Angle profile ALU	e.g. 40 x 40 x 4 lengths at 6.05 m Lengths and other sizes depending on requirements	On enquiry
9671-WASI20		Z profile ALUMINIUM	Z profile ALUMINIUM Length: 6.1 metres 40 x 40 x 40 x 3 mm Other sizes. e. g. 40 x 60 x 40 x 3. available on enquiry	On enquiry
9672 FLAT		ALU Flat	We supply ALUMINIUM flat material in almost any size. Please enquire!	On enquiry
9673 ROUND		ALU Round	We supply ALUMINIUM round material in almost any size. Please enquire!	On enquiry
9674-...		Special profile	We supply special profiles such as window profiles. Please enquire!	On enquiry

3. Modular assembly

3.1. Module clamps for framed modules

Item no.	Figure	Item	Comments	Price
9742- WASI4-...		End clamp ALUMINIUM	<u>Length:</u> 70 mm <u>Width:</u> 30 mm Please specify module height. Data sheet	On enquiry
9745- WASI13		Middle clamp ALUMINIUM	<u>Length:</u> 70 mm <u>Width:</u> 36 mm Data sheet	On enquiry
9664- WASI13D		Cover for end and centre clamp ALUMINIUM	<u>Length:</u> 70 mm Snow deflector and anti-theft deterrent On enquiry Data sheet	On enquiry

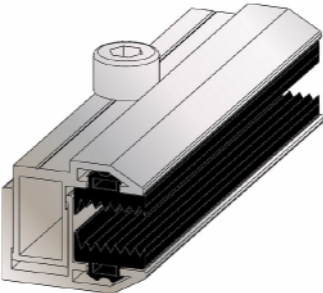
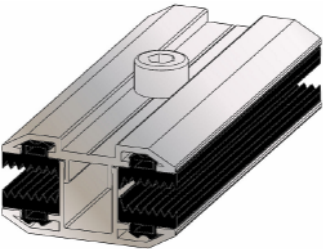
3.2. Screws and accessories for module clamps

Item no.	Item	Price
Allen screws: 		
912-2-8*30	M8*30 mm	On enquiry
912-2-8*35	M8*35 mm	On enquiry
912-2-8*40	M8*40 mm	On enquiry
912-2-8*45	M8*45 mm	On enquiry
912-2-8*50	M8*50 mm	On enquiry
912-2-8*55	M8*55 mm	On enquiry
912-2-8*60	M8*55 mm	On enquiry
9250-2-8.4	Locking washer A2 8.4 mm	On enquiry

3.3. Use of Allen screws for different module heights

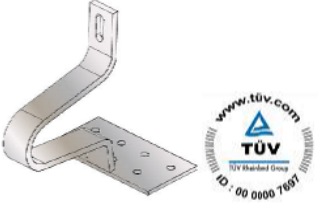
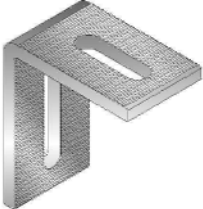
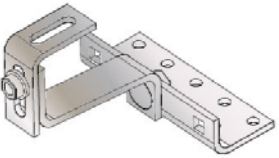
Module height	Screw for rail with sliding block	Locking washer (for sliding block channel only)	Screw for rail with square nut ¹⁾
32 mm	Allen. M8 x 35		Allen. M8 x 35 or x 40
34 mm	Allen, M8 * 35		Allen, M8 * 35 oder *40
35 mm	Allen, M8 * 40	x	Allen, M8 * 40 oder *45
36 mm	Allen, M8 * 40	x	Allen, M8 * 40 oder *45
38 mm	Allen, M8 * 40		Allen, M8 * 40 oder *45
40 mm	Allen, M8 * 45	x	Allen, M8 * 45 oder *50
41 mm	Allen, M8 * 45	x	Allen, M8 * 45 oder *50
42 mm	Allen, M8 * 45		Allen, M8 * 45 oder *50
45 mm	Allen, M8 * 50	x	Allen, M8 * 50 oder *55
46 mm	Allen, M8 * 50	x	Allen, M8 * 50 oder *55
50 mm	Allen, M8 * 55	x	Allen, M8 * 55 oder *60

¹⁾ Both specified lengths can be used with these square nuts.

3.4. Module clamps for glass modules				
Item no.	Figure	Item	Comments	Price
9742 laminate L		End clamp ALUMINIUM	• Practical clip connection • UV resistant EPDM rubber • Modular height adjustable • FirstSolar approval You also require one Allen screw DIN 912 A2 8x35	On enquiry
9745 laminate L		Middle clamp ALUMINIUM	• Practical clip connection • UV resistant EPDM rubber • Modular height adjustable • FirstSolar approval You also require one Allen screw DIN 912 A2 8x35	On enquiry

4. Solar fixings for tiled roofs

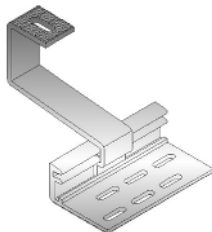
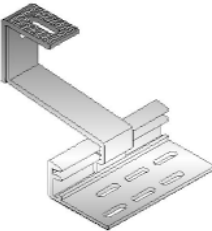
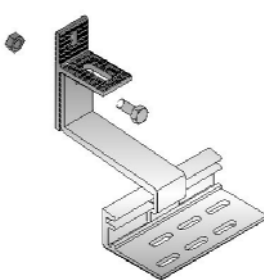
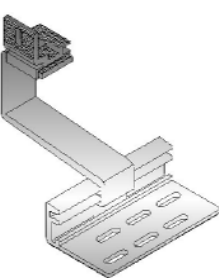
4.1. Roof hooks and accessories made of stainless steel

Item no.	Figure	Item	Comments	Price
9523-2-1508040		Vario 40 roof hook	Plate 150 x 80 x 5 mm bottom bracket 40 mm rounded hook 8 mm Material: 1.4301	On enquiry
9523-2-55*45*5		Angle for VARIO For mounting on bottom rail channel	Material: 1.4301 55 x 45 x 35 x 5 mm 2 long holes 11 x 25 For mounting, you need 1 x 603-2-10 x 25 + 9345-2-10	On enquiry
9523-2-1508040 S	Illustration to follow	Vario Standard 40 roof hook	Plate 150 x 80 x 5 mm bottom bracket 43 mm rounded hook 8 mm Material: 1.4301 Rail connection from below without additional angle	On enquiry
9521-2-180X80		Roof hook standard	Plate 180 x 80 x 5 mm Hook 35 x 6 mm Height 139 mm	On enquiry
9525-2-140*56K		Roof hook adjustable	Plate 144 x 56 x 5 mm Hook 5 mm pre-assembled Material: 1.4301	On enquiry

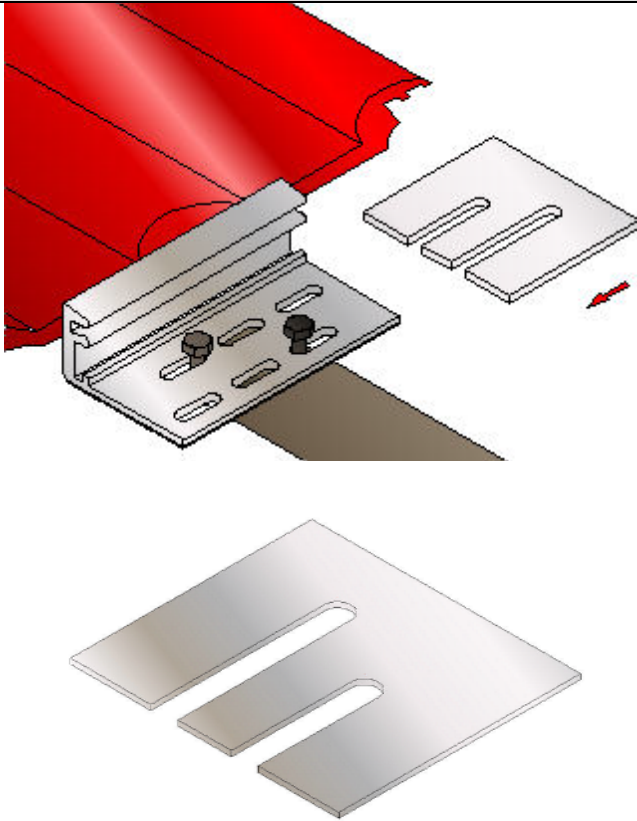
From Page 35 onwards, you will find an **enquiry form for roof hook shapes** which you cannot find here.

We recommend our special washer-head screws for fastening the roof hooks onto the rafter. (see heading "Screw accessories")

We will be happy to send you structural calculations for the roof hooks on request.

4.2. Aluminium roof hooks				
Item no.	Figure	Item	Comments	Price
9721-AL-32		Roof hooks. end-to-end	For 32 mm battens Height of base plate 46 mm	On enquiry
9721-AL-40		Consisting of base plate and hook for clipping	For 40 mm battens Height of base plate 54 mm	On enquiry
9723-AL-32		Roof hook. with height adjustment on the hook	For 32 mm battens Height of base plate 46 mm	On enquiry
9723-AL-40		Consisting of base plate and pre-assembled hook	For 40 mm battens Height of base plate 54 mm	On enquiry
9724-AL-32		Roof hook lateral mounting with height adjustment	For 32 mm battens Height of base plate 46 mm	On enquiry
9724-AL-40		Consisting of base plate and hook with T-piece pre-assembled	For 40 mm battens Height of base plate 54 mm	On enquiry
9725-AL-32		Roof hook for vertical mounting	For 32 mm battens Height of base plate 46 mm	On enquiry
9725-AL-40		Consisting of base plate and pre-assembled hook On enquiry	For 40 mm battens Height of base plate 54 mm	On enquiry
From Page 35 onwards. you will find an enquiry form for roof hook shapes which you cannot find here.				
We recommend our special washer-head screws for fastening the roof hooks onto the rafter. (see heading "Screw accessories")				
We will be happy to send you structural calculations for the roof hooks on request.				

4.3. Support plates for roof hooks, aluminium

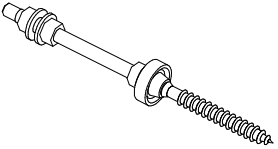
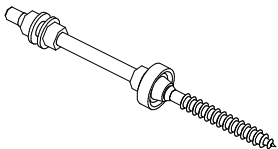
Item no.	Item	Price
		
9731-2*130702	Support plate, 2 mm aluminium	On enquiry
9731-3*130703	Support plate, 3 mm aluminium	On enquiry
9731-5*130705	Support plate, 5 mm aluminium	On enquiry

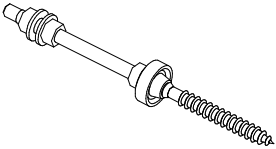
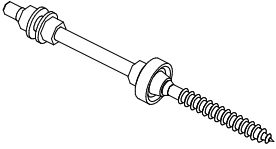
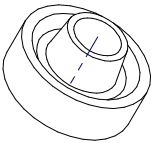
5. Solar fixings for sheet metal and Eternit (asbestos-cement) roofs

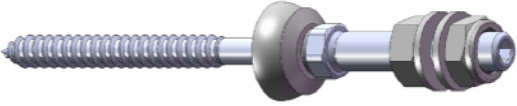
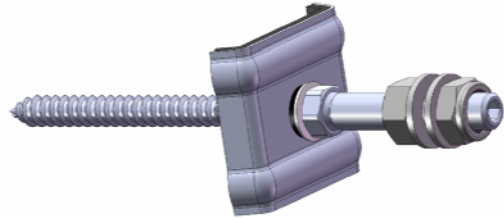
5.1. Approved dowel screws for timber supporting structures

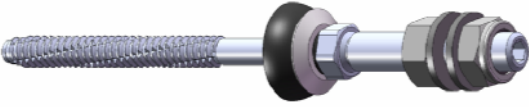
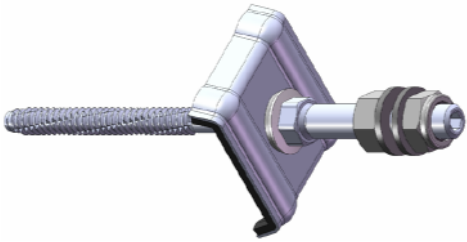
Item no.	Figure	Item	Comments	Price
9211-2-10*180		Dowel screws A2	Dowel Screw (WS9211) hexagon head 7 AF M10x180 mm thread length : Metric: 100 mm wood: 60 mm	On enquiry
9211-2-10*200		Dowel screws A2	Dowel Screw (WS9211) hexagon head 7 AF M10x200 mm thread length : Metric: 110 mm wood: 70 mm	On enquiry
9211-2-10*250		Dowel screws A2	Dowel screw (WS9211) hexagon head 7 AF M10x250 mm thread length: Metric: 130 mm wood: 80 mm	On enquiry
9211-2-10*300		Dowel screws A2	Dowel screw (WS9211) hexagon head 7 AF M10x250 mm thread length: Metric: 140 mm wood: 100 mm	On enquiry
9211-2-12*250		Dowel screws A2	Dowel screw (WS9211) hexagon head 8 AF M12x250 mm thread length: Metric: 130 mm wood: 100 mm	On enquiry

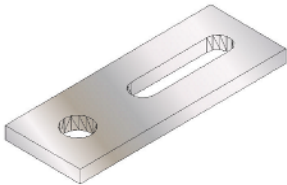
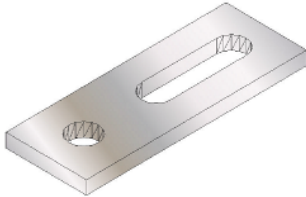
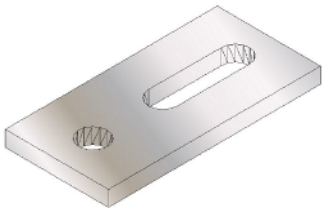
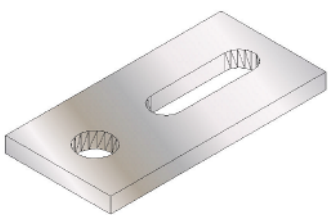
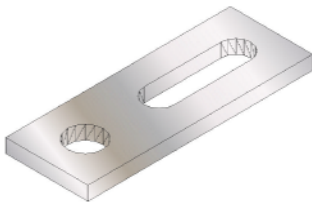
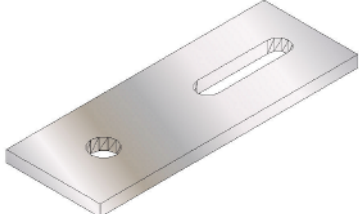
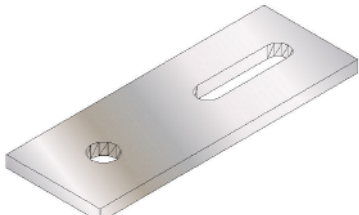
9211-2-12*300		Dowel screws A2	Dowel screw (WS9211) hexagon head 8 AF 12x300 mm thread length : Metric: 140 mm wood: 100 mm	On enquiry
9211-2-12*350		Dowel screws A2	Dowel screw (WS9211) hexagon head 8 AF 12x300 mm thread length : Metric: 180 mm wood: 130 mm	On enquiry

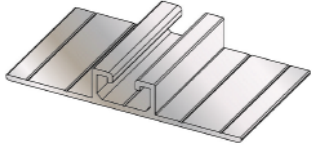
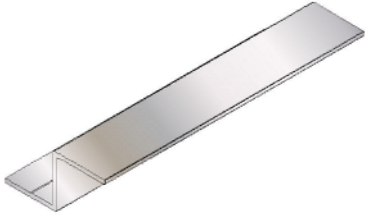
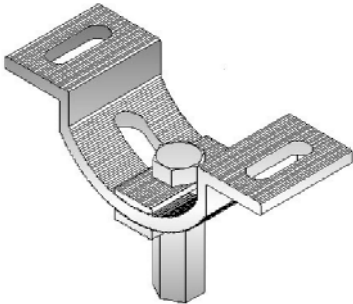
5.2. Pre-assembled dowel screws for timber supporting structures				
Item no.	Figure	Item	Comments	Price
.9215-2-...		Dowel screws hexagon head. pre-assembled (similar picture)	Pre-assembled with 3 hexagon nuts DIN 934 A2 + 3 washers DIN 125 A2 + EPDM gasket WS9218 All dimensions see above WS 9211 with this pre-assembled item available from stock.	On enquiry
.9216-2-...		Dowel screws Hexagon head. pre-assembled (similar picture)	Pre-assembled with 3 serrated nuts WS9345 A2 + EPDM seal WS9218 All dimensions see above WS 9211 with this pre-assembled item available from stock.	On enquiry

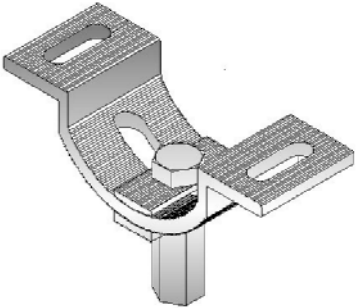
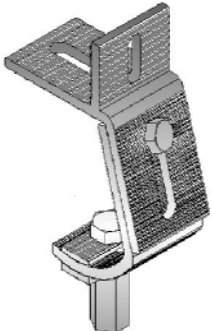
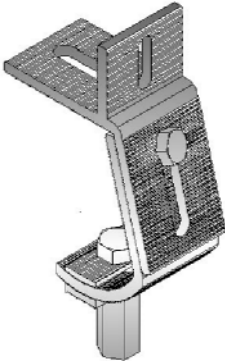
.9217-2-...		Dowel screws Hexagon head. pre-assembled (similar picture)	Pre-assembled with 2 serrated nuts WS9345 A2 + EPDM seal WS9218 All dimensions see above WS 9211 with this pre-assembled item available from stock.	On enquiry
.9219-2-...		Dowel screws Hexagon head. pre-assembled (similar picture)	Pre-assembled with 3 hexagon nuts DIN 934 A2 + 2 washers DIN 125 A2 + EPDM gasket WS9218 All dimensions see above WS 9211 with this pre-assembled item available from stock.	On enquiry
9218 10-12			EPDM – seal approx. 60° Shore A for dowel screws M10/M12	On enquiry
Other pre-assembled items available on enquiry				

5.3. Approved dowel screws for timber supporting structures				
Item no.	Figure	Item	Comments	Price
9221-2-...		Dowel screws Allen head. pre-assembled	Dowel screw for timber supporting structure. with special coating Pre-assembled with nuts, washers and mushroom seal Approval from the construction supervision authority	On enquiry
9221-2-...		Dowel screws Allen head. pre-assembled	Dowel screw for timber supporting structure. with special coating Pre-assembled with nuts, washers and calotte (cup) Approval from the construction supervision authority	On enquiry

5.4. Approved dowel screws for steel supporting structures				
Item no.	Figure	Item	Comments	Price
9222-2-...		Dowel screws Allen head. pre-assembled	Dowel screw for steel supporting structure. with special coating Pre-assembled with nuts, washers and mushroom seal Approval from the construction supervision authority	On enquiry
9222-2-...		Dowel screws Allen head. pre-assembled	Dowel screw for steel supporting structure. with special coating Pre-assembled with nuts, washers and calotte (cup) Approval from the construction supervision authority	On enquiry

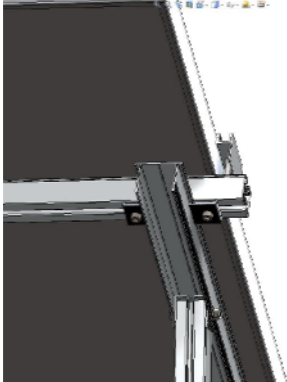
5.5. Adaptor plates for dowel screws				
Item no.	Figure	Item	Comments	Price
9542-2-82*30*5		Adaptor plate stainless steel A2 for dowel screws M10	L: 82 mm x W: 30 mm x H: 5 mm round hole: 11 mm long hole: 9 x 29.5 mm Material: 1.4301 For dowel screws M10 and M8 screw fixing in the bottom rail channel	On enquiry
9543-2-82*30*5		Adaptor plate stainless steel A2 for dowel screws M10	L: 82 mm x W: 30 mm x H: 5 mm round hole: 11 mm long hole: 11 x 29.5 mm Material: 1.4301 For dowel screw M10 and M10 screw fixing in the bottom rail channel	On enquiry
9543-AL82*40*6		Adaptor plate. aluminium. for dowel screws M10	L: 82 mm x W: 40 mm x H: 6 mm round hole: 11 mm long hole: 11 x 29.5 mm Material: Aluminium For dowel screw M10 and M10 screw fixing in the bottom rail channel	On enquiry
9544-AL82*40*6		Adaptor plate. aluminium. for dowel screws M12	L: 82 mm x W: 40 mm x H: 6 mm round hole: 13 mm long hole: 11 x 29.5 mm Material: Aluminium For dowel screw M12 and M10 screw fixing in the bottom rail channel	On enquiry
9544-2-82*30*5		Adaptor plate stainless steel A2 for dowel screws M12	L: 82 mm x W: 30 mm x H: 5 mm round hole: 13 mm long hole: 11 x 29.5 mm Material: 1.4301 For dowel screw M12 and M10 screw fixing in the bottom rail channel	On enquiry
9548-2-110*40		Adaptor plate stainless steel A2 for dowel screws M10	L: 110 mm x B: 40 mm x H: 5 mm round hole: 11 mm long hole: 11 x 29.0 mm Material: 1.4301 For dowel screws M10 and M8 screw fixing in the bottom rail channel	On enquiry
9549-2-110*40		Adaptor plate stainless steel A2 for dowel screws M12	L: 110 mm x B: 40 mm x H: 5 mm round hole: 13 mm long hole: 11 x 29.0 mm Material: 1.4301 For dowel screws M10 and M8 screw fixing in the bottom rail channel	On enquiry
Other sizes available on enquiry				

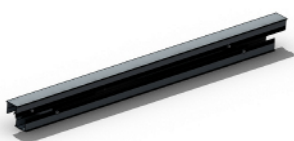
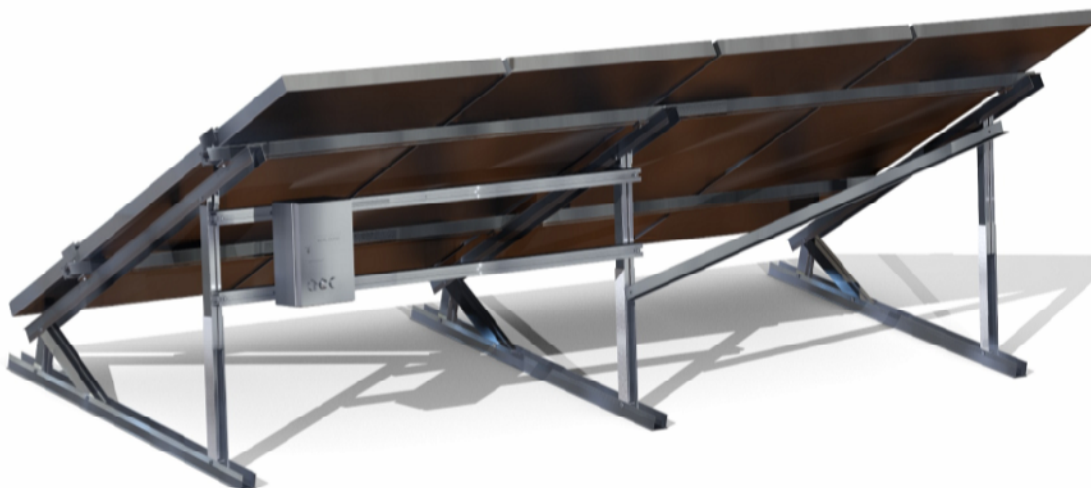
5.6. Accessories for sheet metal and Eternit (asbestos-cement) roofs				
Item no.	Figure	Item	Comments	Price
9664-WASI 31		Trapezoidal rail	Length: depending on requirements The profile can be bolted directly to the trapezoidal sheet. Top channel for sliding block M8	Price on enquiry 703 g/m
9671-WASI20		Z profile ALUMINIUM	Z profile ALUMINIUM Length: 6.1 metres 40 x 40 x 40 x 3 mm Other sizes available on enquiry	On enquiry 921 g/m
9571-AL2-10Z		Round adapter for 10 mm dowel screw or Safetec bracket	Pre-assembled set consisting of: Al round. Al-convex- and concave plates. DIN933-2-M10x30 mm. Hexagon coupler nut WS9300-2-M10x50 mm Angle can be adjusted to 45°	On enquiry

9571-AL2-12Z		Round adapter for 12 mm dowel screws	Pre-assembled set consisting of: Al round. Al-convex- and concave plates. DIN933-2-M12x30 mm. Hexagon coupler nut WS9300-2-M10x50 mm Angle can be adjusted to 45°	On enquiry
9572-AL2-10Z		J adaptor set for 10 mm dowel screw or Safetec bracket	Pre-assembled set consisting of: Al J adaptor. Al hook Al convex and concave plate DIN933-2-M10x25 mm + DIN933-2-M10x30 mm Hexagon coupler nut WS9300-2-M10x50 mm flange nuts with serration WS9345 Height adjustable and fits angles up to 45	On enquiry
9572-AL2-12Z		J adapter for dowel screws 12 mm	Pre-assembled set consisting of: Al J adaptor. Al hook Al convex and concave plate DIN933-2-M10x25 mm + DIN933-2-M12x30 mm Hexagon coupler nut WS9300-2-M12x50 mm flange nuts with serration WS9345 Height adjustable and fits angles up to 45	On enquiry
9590-AL-10 9590- AL-12		Adaptor for 10 mm and 12 mm dowel screws for rails with side connection	for M10 and M12 predominantly for rails with side connection - rod anodised	On enquiry

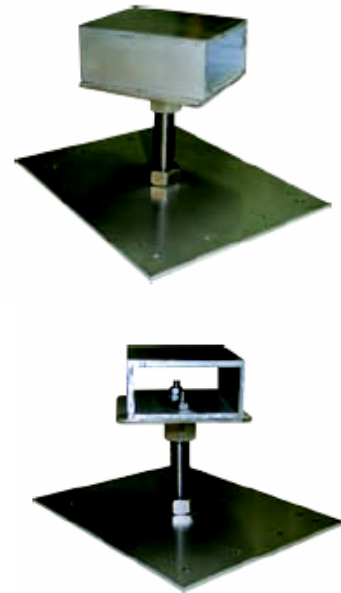
6. Accessories for flat and sheet roofs

6.1. Flat-roof elevation stand

Item no.	Item	Price
9785-WASI 2040	Flat roof elevation triangle. aluminium ❖ Folding ❖ Variable adjustment 20° to 40° ❖ Available from stock ready assembled They require 8 x 9785-WASI 26 mounting plates per triangle. Diagonal struts (angle 40 x 40 x 3) (see Point 8) accessory parts made of aluminium.	On enquiry
9785-WASI 26	Mounting plates for attaching the mounting rails to the triangle 	On enquiry



6.2. Flat roof supports



Ihre Vorteile:

- ☐ Lastenleitung direkt auf die Tragebene
- ☐ unabhängig von der Lage der Binder
- ☐ ohne zusätzliche Beanspruchung der Dachhaut oder der Wärmedämmung
- ☐ Ausrichtung (z.B. zur Sonne) unabhängig von der Gebäudelage
- ☐ zum nachträglichen Einbau besonders geeignet

Ihre Einsatzmöglichkeiten:

- ☐ für Solar- / Photovoltaik-Anlagen
- ☐ für Wartungs- und Montagewege
- ☐ für Flachdach-Aufbauten wie Klimageräte, Schaltkästen u.ä.
- ☐ zur Aufständigung von Rohrleitungen und Kabelbahnen
- ☐ als Blitzschutzkonsole

Ihr Nutzen bei Photovoltaik-Anlagen:

- ☐ aktiver Beitrag zum Umweltschutz
- ☐ Möglichkeit, die Flachdachfläche neu zu nutzen
- ☐ Einsparung von Stromkosten
- ☐ Förderung erneuerbarer Energien
- ☐ Dauerhafte und unabhängige Energieversorgung

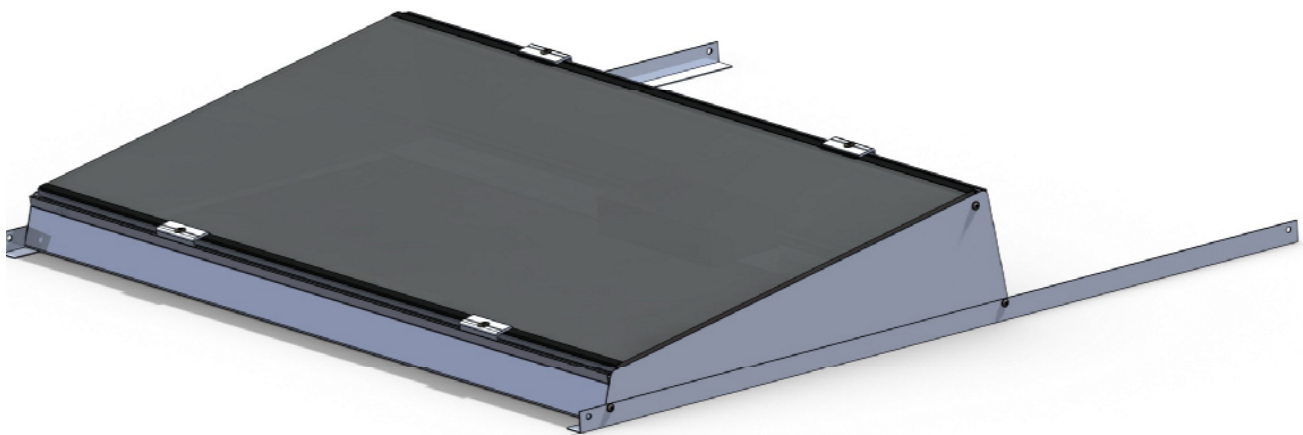
Unser Lieferprogramm FLD-Stützen:

- ☐ Dämmdicke bis 240 mm
- ☐ Nach statischer Berechnung
- ☐ Preise auf Anfrage

6.3. WASI Aerobox

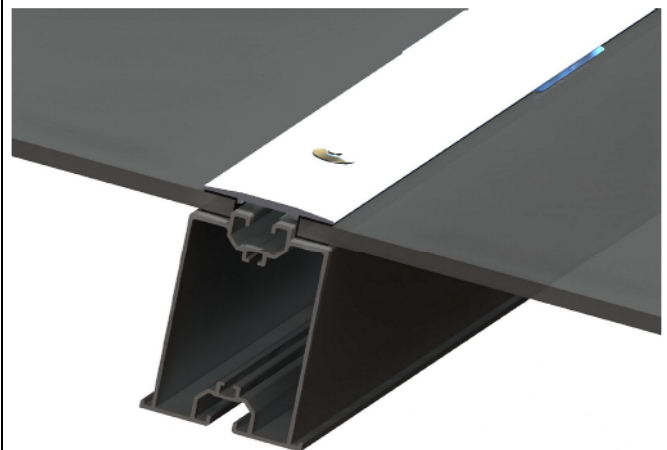
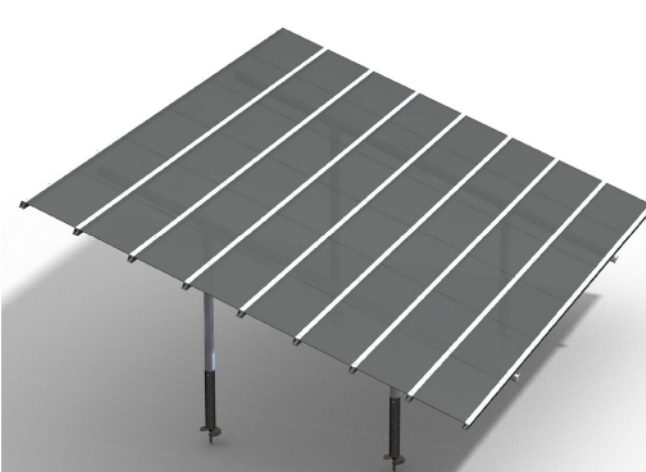
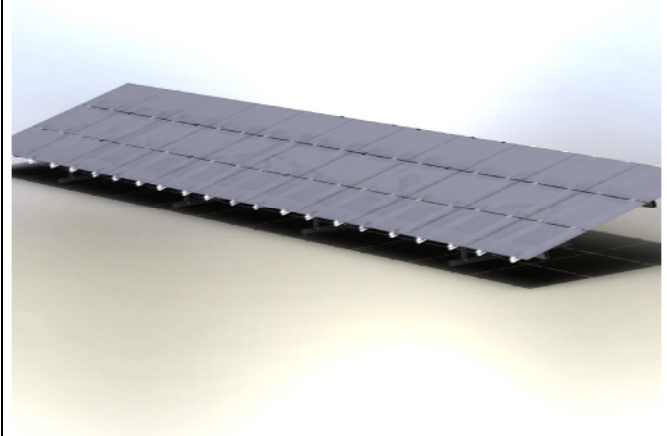
The WASI Aerobox system has an angle of inclination of 10° and makes for high energy efficiency.

- ❖ No roof penetration
 - Flat roof system without mechanical roof fixing easy to install.
- ❖ Quick to install
 - Large area solar fields can be installed efficiently and quickly put into operation
- ❖ No impairment
 - Solar modules do not impair the function of the roof or the water drainage system



7. Open land installations

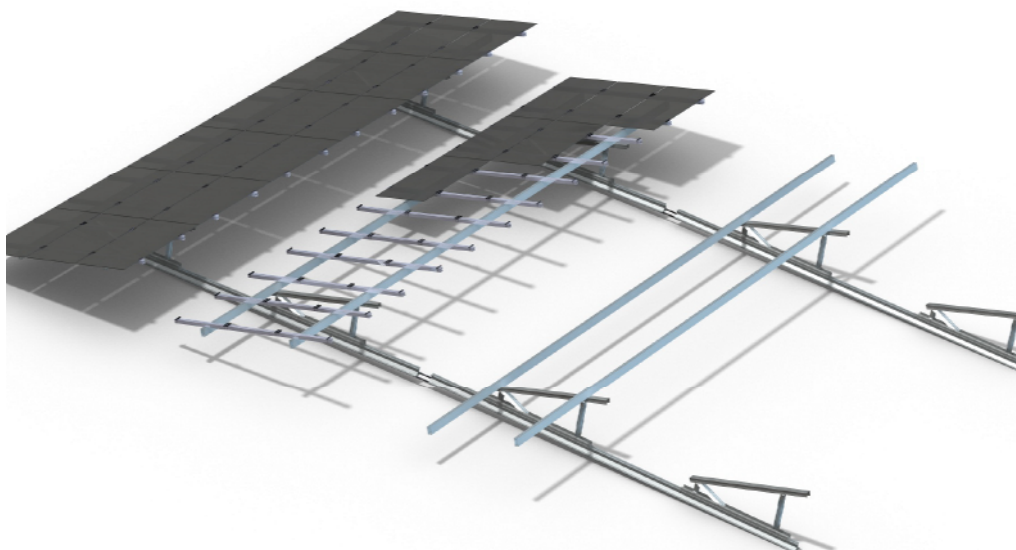
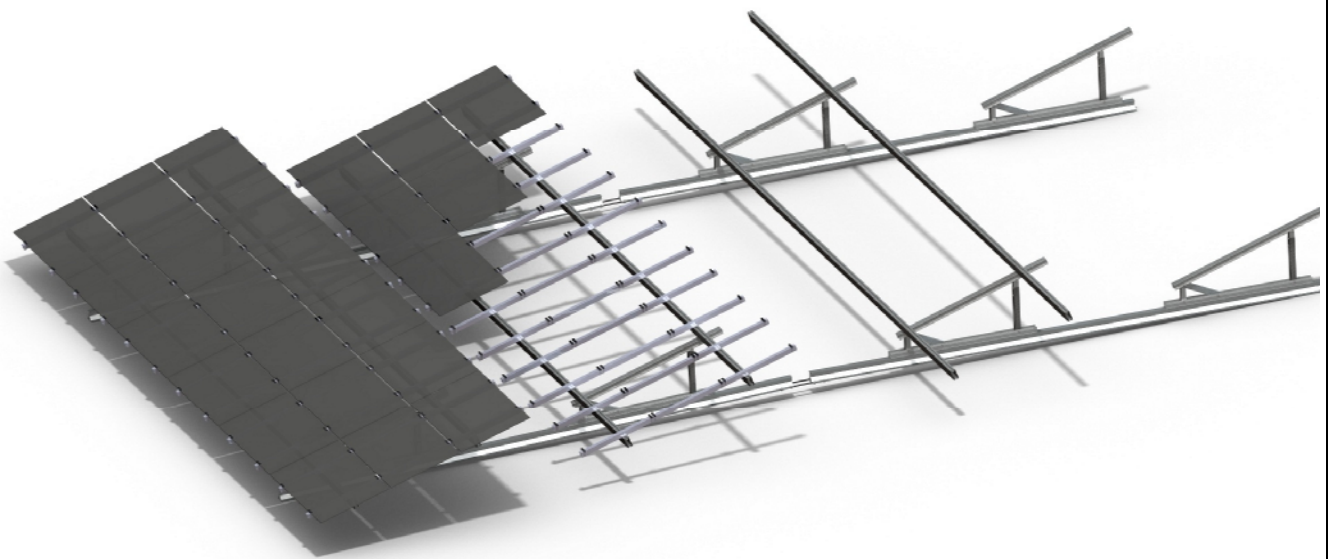
Special elevations, even for open-land installations, are available on [Enquiry](#).



8. Project planning

WASI Solar is the ideal partner for your projects.

Send us your Enquiry!

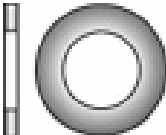


9. Screw accessories, Solar

For information: WASI Solar will not only supply you with our innovative solar items but also all the other rust-proof connection elements. With 24.000 items permanently available in stock, WASI is not just a supplier with one of the widest and deepest ranges of products on the market but also a global market leader in rust-proof connection elements – available in grades A1 to A5 and in all strength classes.

Here is a small selection

Item no.	Figure	Item	Comments	Price
9810-0-*.....		Washer head screws with TX drive. stainless steel. hardened Approved by the construction supervision authority for fastening roof hooks etc.	M8x80	On enquiry
			M8x100	On enquiry
			M8x120	On enquiry
571-2-*.....		Hexagon head – wood screws for fastening roof hooks etc.	8*8010*80 8*10010*100 8*12010*120 8*14010*140 8*16010*160 8*18010*180 8*20010*200 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
912-2-*..... 912-4-*.....		Cheese head Allen screw in A2 and A4 according to DIN912	for fastening our module clamps etc. see table under 7.) Module clamps	On enquiry
933-2-*..... 933-4-*.....		Hexagon head screw full thread in A2 and A4 according to DIN933	including size M10x25 for bottom rail channel Item 9664-WASI1	On enquiry
9415-2-*..... 9415-4-*.....		Hammerhead screw A2 and A4 for mounting rail Type 28/15 according to WASI standard WS9415 (other rail types available on enquiry)	M8*20M10*20 M8*25M10*25 M8*30M10*30 M8*35M10*40 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9021-2-..... 9021-4-.....		Washer with large external diameter in A2 and A4 according to DIN9021	innen- außen- für: (mm) (mm) M8 8,4 24,0 M10 10,5 30,0 M12 13,0 37,0 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry

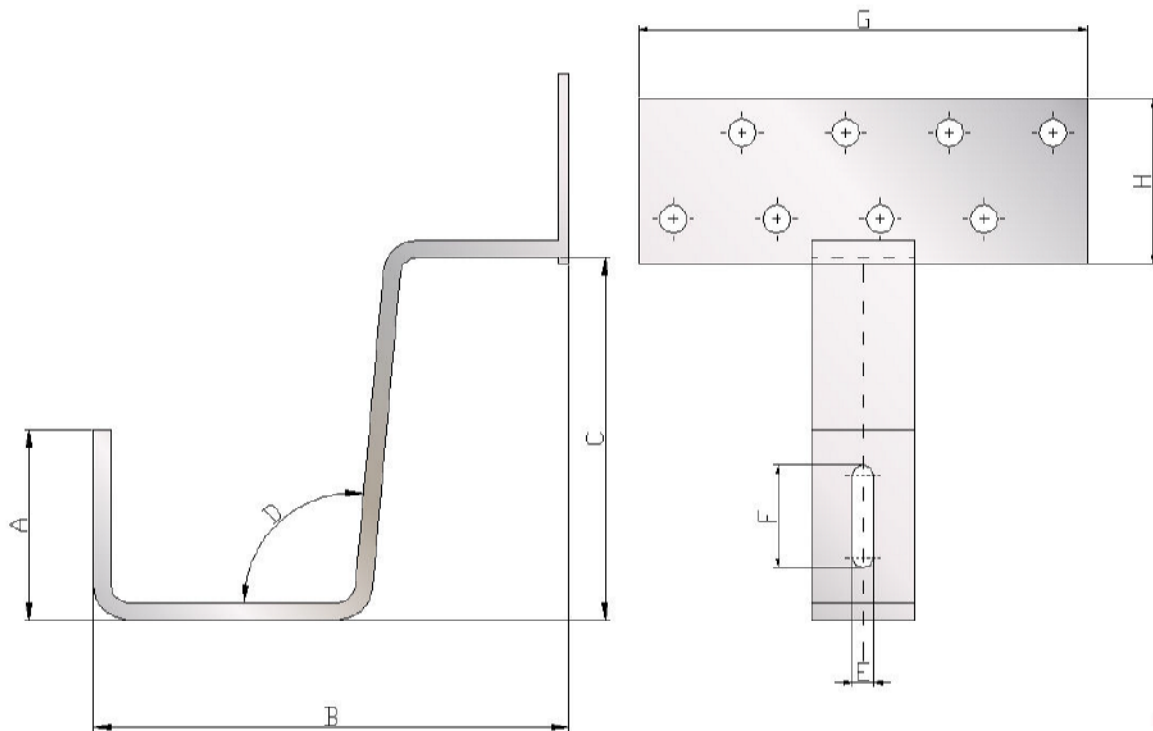
9. Screw accessories, Solar																
Item no.	Figure	Item	Comments	Price												
125-2-..... 125-4-.....		Washer in A2 and A4 according to DIN125	<table><tr><td>für:</td><td>innen- (mm)</td><td>außen- (mm)</td></tr><tr><td>M8</td><td>8,4</td><td>16,0</td></tr><tr><td>M10</td><td>10,5</td><td>20,0</td></tr><tr><td>M12</td><td>13,0</td><td>24,0</td></tr></table> weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	für:	innen- (mm)	außen- (mm)	M8	8,4	16,0	M10	10,5	20,0	M12	13,0	24,0	On enquiry
für:	innen- (mm)	außen- (mm)														
M8	8,4	16,0														
M10	10,5	20,0														
M12	13,0	24,0														
9250-2-....		Locking washers “S” for our module clamps etc. see table under Point 7.) Module clamps	<table><tr><td>für:</td><td>innen- (mm)</td><td>außen- (mm)</td></tr><tr><td>M8</td><td>8,4</td><td>13,0</td></tr><tr><td>M10</td><td>10,5</td><td>16,0</td></tr><tr><td>M12</td><td>13,0</td><td>18,0</td></tr></table> weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	für:	innen- (mm)	außen- (mm)	M8	8,4	13,0	M10	10,5	16,0	M12	13,0	18,0	On enquiry
für:	innen- (mm)	außen- (mm)														
M8	8,4	13,0														
M10	10,5	16,0														
M12	13,0	18,0														
25201-4-.....*.....		Self-locking screw – retaining washer in A4 according to DIN25201	<table><tr><td>für:</td><td>innen- (mm)</td><td>außen- (mm)</td></tr><tr><td>M8</td><td>8,7</td><td>13,5</td></tr><tr><td>M10</td><td>10,7</td><td>16,0</td></tr><tr><td>M12</td><td>13,0</td><td>19,5</td></tr></table> weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	für:	innen- (mm)	außen- (mm)	M8	8,7	13,5	M10	10,7	16,0	M12	13,0	19,5	On enquiry
für:	innen- (mm)	außen- (mm)														
M8	8,7	13,5														
M10	10,7	16,0														
M12	13,0	19,5														
9480-2-.....*.....		Security screw mushroom head in A2 similar to ISO7380 (with TX drive and locking pin.)) BITS (WS9488) and L keys (WS9489) from stock	<table><tr><td>M8*20</td></tr><tr><td>M8*30</td></tr><tr><td>M8*40</td></tr></table> weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	M8*20	M8*30	M8*40	On enquiry									
M8*20																
M8*30																
M8*40																
603-2-.....*..... 603-4-.....*.....		Mushroom head square neck bolt in A2 and A4 according to DIN603	<table><tr><td>M10*20</td></tr><tr><td>M10*25</td></tr><tr><td>M10*25</td></tr></table> weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	M10*20	M10*25	M10*25	On enquiry									
M10*20																
M10*25																
M10*25																

9. Screw accessories, Solar				
Item no.	Figure	Item	Comments	Price
557-2-..... 557-4-.....		Square nut in A2 and A4 according to DIN557	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
934-2-..... 934-4-.....		Hexagon nut in A2 and A4 according to DIN934	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
985-2-..... 985-4-.....		Stop nut. thin in A2 and A4 according to DIN985	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9345-2-..... 9345-4-.....		Hexagon nut similar to DIN 6923 with flange and serration in A2 and A4	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9290-2-.....*..... 9290-4-.....*.....		Coupler nut with end-to-end internal thread. round version in A2 and A4 according to Wasi standard WS9290	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9300-2-.....*..... 9300-4-.....*.....		Coupler nut with end-to-end internal thread. hexagonal version in A2 and A4 according to Wasi standard WS9300	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry

9. Screw accessories, Solar				
Item no.	Figure	Item	Comments	Price
127-2-..... 127-4-.....		Spring lock washer. A2 and A4 according to DIN127	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9305-2-.....		Shear nut according to WASI standard WS9305	M6 M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9265-2-.....		Serrated locking washer shape M (middle) according to Wasi standard 9265 for high-strength connections with normal washer face	M8 M10 M12 weitere Abmessung aus Vorrat lieferbar !! (siehe www.wasi.de)	On enquiry
9360-2-...		VA compound anchor mortar cartridge VA-P	For fastening dowel screws in concrete	On enquiry
9495-ZN-...		Star inserts for TX drive	Material: Zinc diecast For TX sizes 10-40	On enquiry
5401-2-40-6,25		Ball for driving in	Balls Niro 304 6.25 mm Grade40 For securing Allen screws SW6	On enquiry

Order sheet for pan roof hooks

Pan roof hooks



Please enter your particular dimensions

A	B	C	D	E	F	G	H

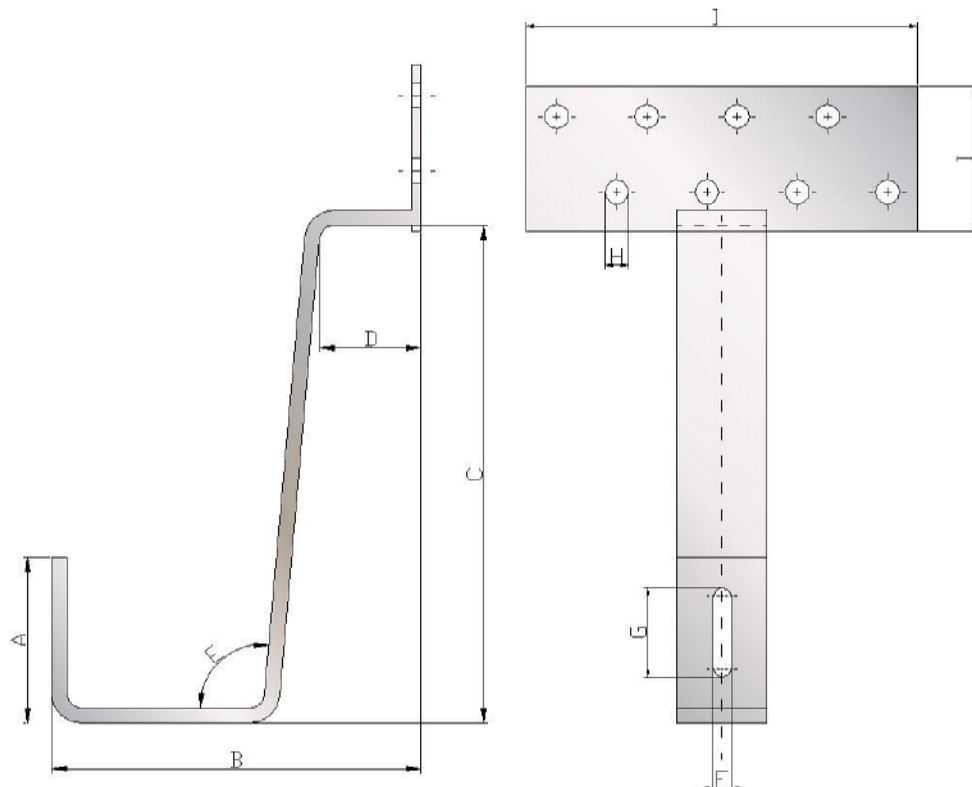
Number of pieces

Delivery address

We make them out of 5 mm thick stainless steel 1.4301 unless instructed otherwise.

Order sheet for flat-tail roof hooks

Flat-tail roof hooks



Please enter your particular dimensions

A	B	C	D	E	F	G	H	I	J

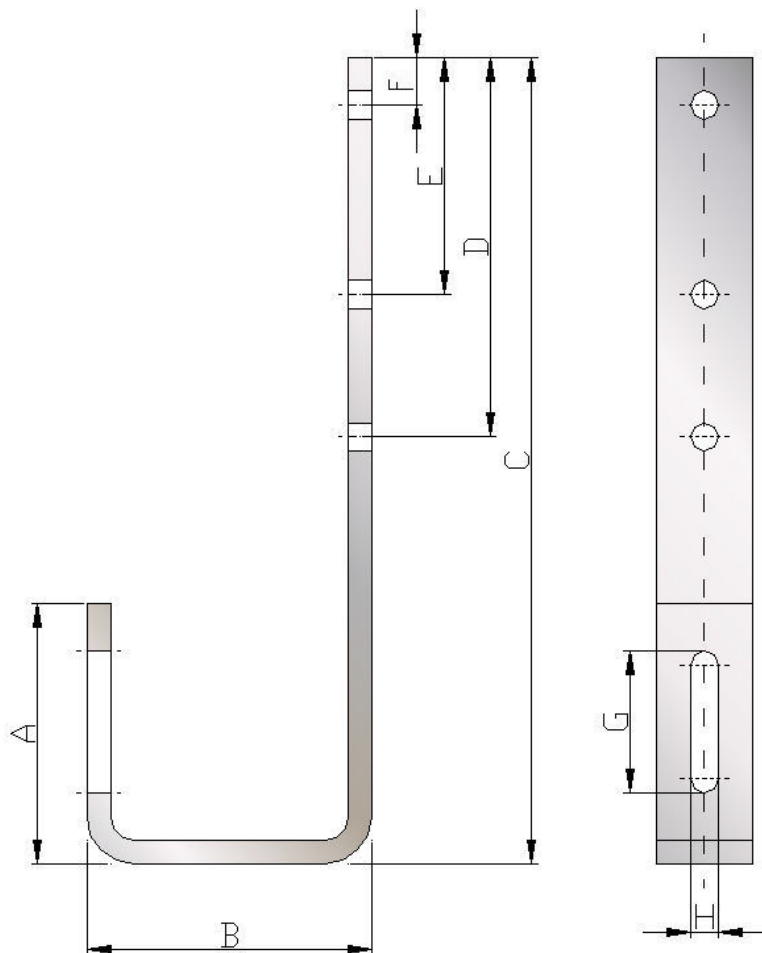
Number of pieces

Delivery address

We make them out of 5 mm thick stainless steel 1.4301 unless instructed otherwise.

Order sheet for slate roof hooks

Slate roof hooks



Please enter your particular dimensions

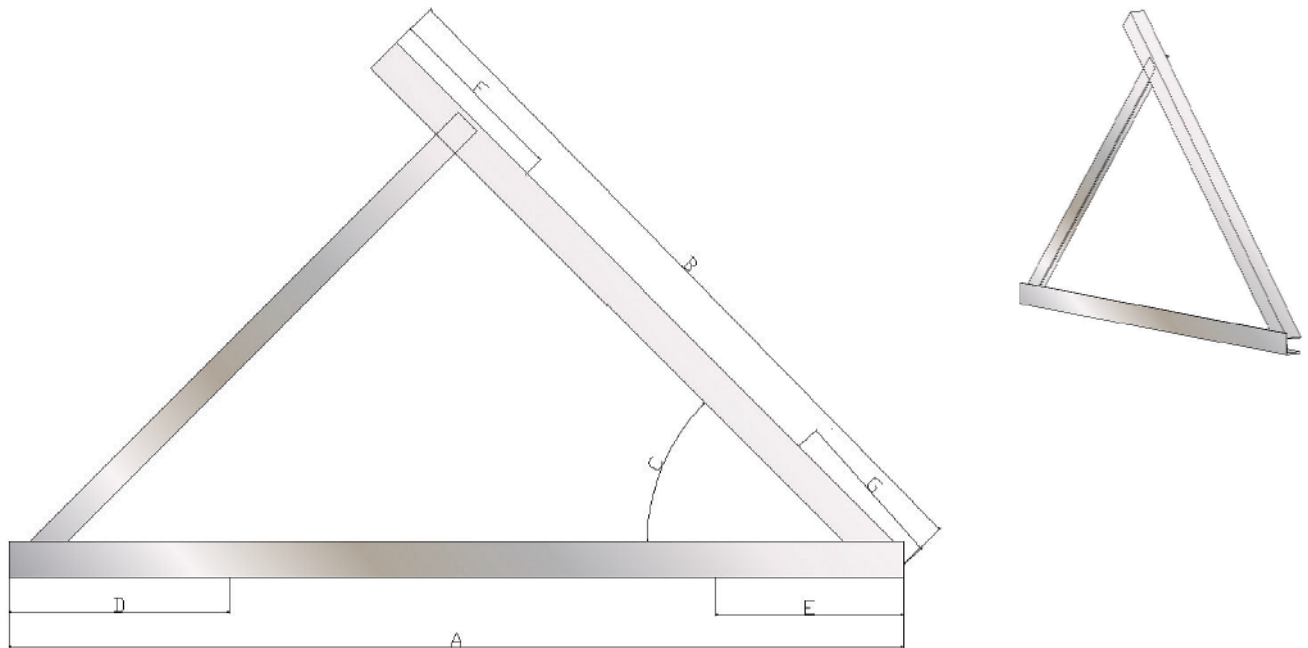
A	B	C	D	E	F	G	H

Number of pieces

Delivery address

We make them out of 5 mm thick stainless steel 1.4301 unless instructed otherwise.

Order sheet for elevations



Please enter your particular dimensions

A	B	C	D	E	F	G

Material (e.g. angle 40 x 40 x 3):

Number of pieces

Delivery address

Enquiry / calculation form

Name :

Customer no. :

Address :

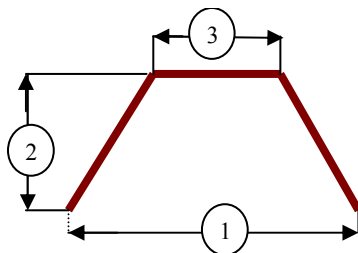
Phone: Fax: e-mail:

Type of fixing: On roof Elevation

Roof cladding: Clay tiles..... Concrete tiles..... Trapezoidal sheets..... Corrugated sheets..... Eternit.....

Manufacturer/other information:

Trapezoidal sheet --> If you do not know the manufacturer and the ID:



1) Jaw lengthin mm

2) Shank lengthin mm

3) Neck lengthin mm

Please note: With sandwich elements. specify total height (Trapezoidal sheet + insulation = element thickness)

Building information : Building height (from ground to ridge in m).....

Snow-load zone (KN/qm):..... Wind-load zone:Roof pitch:.....(in degrees)

Category: Within Germany Coastal area (5 km strip) Island

Roof specifications : Rafters Purlins Spacing between rafters/purlins in cm
(centre to centre)

Material of rafters/purlins (supporting structure) : Concrete..... Steel Timber

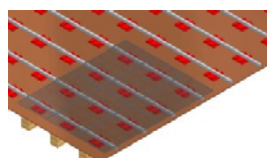
Dimensions of roof battens (width x height in cm):

Module specifications: Number of modules: Type of module:.....

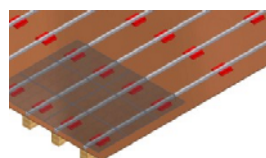
Dimensions of module (please specify anyway) length x width x height in mm:.....

Alignment of module: upright crosswise Weight of module (in g).....

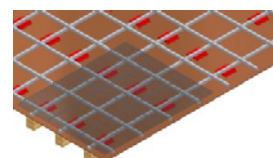
Roof dimensions: Profile placement:



horizontal placement
(parallel to ridge)



vertical placement
(perpendicular to ridge)



cross bracing
(with base rail)

Your contact person

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