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to Article 29 of the Regulation (EU)  
No 305/2011 of the European  
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March 2011

MEMBER OF EOTA



## European Technical Assessment ETA-14/0416 of 19/06/2017

### General Part

#### Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the  
construction product:

AV Post bases

Product family to which the  
above construction product  
belongs:

Three-dimensional nailing plate (Post bases for the  
support of timber columns and posts as load-bearing  
elements)

Manufacturer:

August Vormann GmbH & Co. KG  
Postfach 1552  
Heilenbecker Strasse 191 - 205  
DE-58256 Ennepetal  
Tel. +49 02333 / 978 - 0  
Fax +49 02333 / 978 - 241599  
Internet [www.vormann.com](http://www.vormann.com)

Manufacturing plant:

August Vormann GmbH & Co. KG  
Berliner Strasse 50  
DE-04910 Elsterwerda

This European Technical  
Assessment contains:

62 pages including 2 annexes which form an integral  
part of the document

This European Technical  
Assessment is issued in  
accordance with Regulation  
(EU) No 305/2011, on the  
basis of:

Guideline for European Technical Approval (ETAG) No.  
015 Three Dimensional Nailing Plates, April 2013, used  
as European Assessment Document (EAD).

This version replaces:

The ETA with the same number issued on 2015-01-30

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## II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

### 1 Technical description of product and intended use

#### Technical description of the product

The post bases are made from 3,0 mm to 8,0 mm thick steel plates in combination with reinforcing bars, threaded rods or steel tubes. The post bases are produced from steel grade S235JR according to EN 10025-2:2004 with minimum characteristic yield strength of  $R_e = 235 \text{ N/mm}^2$  and minimum characteristic tensile strength of  $R_m = 360 \text{ N/mm}^2$  and from stainless steel according to EN 10088-2:2001 with minimum characteristic yield strength of  $R_{p0,2} = 220 \text{ N/mm}^2$  and minimum characteristic tensile strength of  $R_m = 520 \text{ N/mm}^2$ . Threaded rods correspond to property class 4.6 according to DIN EN ISO 898-1, stainless steel bars have a minimum characteristic yield strength of  $R_{p0,2} = 190 \text{ N/mm}^2$  and minimum characteristic tensile strength of  $R_m = 500 \text{ N/mm}^2$ . The reinforcing bars are produced from steel grade B 500 A according to EN 10080:2005 with minimum characteristic yield strength of  $R_{eH} = 500 \text{ N/mm}^2$ .

The post base types 071312000, 071313000, 071325000, 071326000, 071329000, 071331000, 071332000, 071333000, 071345000 and 071346000 can be made with a galvanic coating Fe/Zn 15/DSP corrosion protection

For the connections with metal fasteners dowels and bolts  $\varnothing 8,0$  and  $\varnothing 10,0$  mm (S235) and screws  $\varnothing 6,0$  and  $\varnothing 10,0$  mm according to EN 14592:2012 (DIN 571 and thread according to DIN 7998) are used.

Dimensions are shown in Annex A and B.

### 2 Specification of the intended use in accordance with the applicable EAD

The post bases are intended for use as support of timber columns and posts as load-bearing elements, where requirements for mechanical resistance and stability and safety in use in the sense of the Basic Work Requirements 1 and 4 of the Regulation 305/2011 (EU) shall be fulfilled.

The static and kinematical behaviour of the timber members or the supports shall be as described in Annex B.

The timber posts may be of solid timber of strength class C24 or better according to EN 338:2009. Minimum dimensions for the post have to be considered (Annex A).

The post base shall be installed as pictured in the drawings. The cross-section of the timber column shall be positioned centrally and with the end grain plane on the base plate. Some post bases may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (distance  $e$  given in Annex A).

The maximum distance between the foundation and the base plate of the post base is given in Annex A, table A.1.

Annex B states the load-carrying capacities of the post bases for solid timber of strength class C24 according to EN 338:2009. The design of the connections shall be in accordance with Eurocode 3 and Eurocode 5 or a similar national code. The anchorage of the post base in the foundation and imperfections exceeding the assumptions in Eurocode 5, 5.4.4 are not part of this ETA.

The post bases are for use in timber structures subject to the service classes 1, 2 and 3 of Eurocode 5 and for connections subject to static or quasi-static loading. The corrosion protection is given by hot-dip zinc coating with a minimum thickness of  $55 \mu\text{m}$  according to EN 1461:2009, galvanic zinc coating Fe/Zn 25c according to EN ISO 2081:2008 or stainless steel.

Alternatively, the post base types 071312000, 071313000, 071325000, 071326000, 071329000, 071331000, 071332000, 071333000, 071345000 and 071346000 can be made with a galvanic coating Fe/Zn 15/DSP corrosion protection for use in timber structures subject to the service classes 1, 2 and 3 of Eurocode 5 and corrosivity category C1 to C4 in accordance with ISO 9223.

The screws must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081:2008).

The bolts and nuts must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081:2008 or galvanic coating Fe/Zn 15/DSP).

The scope of the connectors regarding resistance to corrosion shall be defined according to national provisions that apply at the installation site considering environmental conditions and in conjunction with the admissible service conditions according to EN 1995-1-1 and the admissible corrosivity category as described and defined in EN ISO 12944-2

#### Assumed working life

The assumed intended working life of the post bases for the intended use is 50 years, provided that they are subject to appropriate use and maintenance. See also section 3.11 of this ETA.

The information on the working life should not be regarded as a guarantee provided by the manufacturer or ETA Danmark. An "assumed intended working life" means that it is expected that, when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements.

### 3 Performance of the product and references to the methods used for its assessment

Characteristic	Assessment of characteristic
<b>3.1 Mechanical resistance and stability (BWR 1)*</b>	
Characteristic load-carrying capacity	See Annex B
Stiffness	No performance determined
Ductility in cyclic testing	No performance determined
<b>3.2 Safety in case of fire (BWR 2)</b>	
Reaction to fire	The post bases are made from steel classified as <b>Euroclass A1</b> in accordance with EN 1350-1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC
<b>3.3 Hygiene, health and the environment (BWR 3)</b>	
Influence on air quality	The product does not contain/release dangerous substances specified in TR 034, dated March 2012
<b>3.7 Sustainable use of natural resources (BWR 7)</b>	No Performance Determined
<b>3.8 General aspects related to the performance of the product</b>	
Identification	The post bases have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species described in Eurocode 5 and subject to the conditions defined by service class 1, 2 and 3 See Annex A

\*) See additional information in section 3.9 – 3.12.

In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

### 3.9 Methods of verification

#### Safety principles and partial factors

The characteristic load-carrying capacities are based on the characteristic values of the connections with metal fasteners, the steel components and the timber post.

In the case of timber failure or failure of the metal fasteners, the design values shall be calculated according to EN 1995-1-1 by dividing the characteristic values of the load-carrying capacities by different partial factors for the strength properties, and in addition multiplied with the coefficient  $k_{mod}$ .

In the case of steel failure, the design value shall be calculated according to EN 1993-1-1 by reducing the characteristic values of the load-carrying capacity with different partial factors.

The design value of the load-carrying capacity is the smaller value of all load-carrying capacities:

$$F_{Rd} = \min \left\{ \frac{k_{mod} \cdot F_{Rk,T}}{\gamma_{M,T}}, \frac{F_{Rk,S}}{\gamma_{M,S}} \right\}$$

Therefore, for timber failure or failure of the metal fasteners the load duration class and the service class are included. The different partial factors  $\gamma_M$  for steel or timber failure, respectively, are also correctly taken into account.

#### 3.10 Mechanical resistance and stability

See Annex B for the characteristic load-carrying capacity in the different directions  $F_1$  to  $F_5$  for solid timber of strength class C24 according to EN 338:2009. Using the load-carrying capacities of the post bases, the specifications in Annex A must be fulfilled. The end grain of the timber post must in general be plane on the base plate of the post base. Some post bases may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (distance  $e$  given in Annex A).

The characteristic capacities of the post bases are determined by calculation according to Eurocode 3 and Eurocode 5. They should be used for designs in accordance with Eurocode 3 and Eurocode 5 or a similar national code.

The design models allow the use of fasteners described in the table on page 11 in Annex A

No performance has been determined in relation to ductility of a joint under cyclic testing. The contribution to the performance of structures in seismic zones, therefore, has not been assessed.

No performance has been determined in relation to the joint's stiffness properties - to be used for the analysis of the serviceability limit state.

No performance has been determined in relation to the anchorage of the post bases in the foundation. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms  $e_{F2/F3}$  (for load case  $F_2 / F_3$ ) and  $e_{F4/F5}$  (for load case  $F_4 / F_5$ ) in annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.

#### 3.11 Aspects related to the performance of the product

Corrosion protection in service class 1, 2 and 3.

In accordance with ETAG 015 the post bases are corrosion protected by hot-dip zinc coating with a minimum thickness of 55  $\mu\text{m}$  according to EN 1461:2009, galvanic zinc coating Fe/Zn 25c according to EN ISO 2081:2008 or stainless steel.

Alternatively, the post base types 071312000, 071313000, 071325000, 071326000, 071329000, 071331000, 071332000, 071333000, 071345000 and 071346000 can be made with a galvanic coating Fe/Zn 15/DSP corrosion protection for use in timber structures subject to the service classes 1, 2 and 3 of Eurocode 5 and corrosivity category C1 to C4 in accordance with ISO 9223.

Note that the corrosion protection period for the corrosion protection options appear from the manufacturers technical dossier. The corrosion protection period for Fe/Zn 25c and hot-dip Zinc with 55 $\mu\text{m}$  can be derived from Eurocode 5 or EN 14713-1, whereas the Fe/Zn 15DSP shall be derived from the manufacturers technical dossier and may be lower than the assumed working life stated elsewhere in this ETA.

The screws must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081:2008).

The bolts and nuts must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081:2008 or galvanic coating Fe/Zn 15/DSP).

#### 3.12 General aspects related to the use of the product

AV post bases are manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation

The following provisions concerning installation apply:

- The timber post
  - shall be restrained against rotation, and supported at the lower and upper end

- shall be strength class C24 according to EN 338:2009 or better, see section 3 of this evaluation report
  - shall be free from wane in the post base
  - must fulfil the requirements regarding minimum dimensions (see Annex A)
  - end grain must in general be plane on the base plate of the post base; some post bases may have a distance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (distance  $e$ , see Annex A)
- The post base shall be installed centrally in the cross-section of the timber column.
  - The actual end bearing capacity of the timber member to be used in conjunction with the post base is checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly.
  - There are no specific requirements relating to preparation of the timber members.
  - The anchorage of the post base in the foundation is not part of this ETA. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms  $e_{F_2/F_3}$  (for load case  $F_2 / F_3$ ) and  $e_{F_4/F_5}$  (for load case  $F_4 / F_5$ ) in Annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.

## **4 Assessment and verification of constancy of performance (AVCP)**


### **4.1 AVCP system**

According to the decision 97/638/EC of the European Commission<sup>1</sup>, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

## **5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2017-06-19 by



Thomas Bruun  
Managing Director, ETA-Danmark

**Annex A**  
**Product details and definitions**

Table A.1 Specifications of the post bases

Post Base				Post		Distances			
Type	Article No.	Size	Fastener	min b	min h	max e	max a	e <sub>F2/F3</sub>	e <sub>F4/F5</sub>
		[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Leichte Stützenschuhe Typ A, U-Form	071274000CE	45	4 x Ø 6,0	45	144	-	50	122	70
	071276000CE	61	4 x Ø 6,0	61	144	-	50	122	70
	071277000CE	71	4 x Ø 6,0	71	144	-	50	122	70
	071278000CE	81	4 x Ø 6,0	81	144	-	50	122	70
	071279000CE	91	4 x Ø 6,0	91	144	-	50	122	70
Leichte Stützenschuhe Typ A, L-Form	071275000CE	44	3 x Ø 6,0	40	144	-	50	-	-
Leichte Stützenschuhe mit Steg	071280000CE	80	5 x Do Ø10,0	80	134	-	50	-	-
Stützenschuhe aufschraubbar	071281000CE	71	8 x Ø 6,0	71	150	10	-	90	34
	071283000CE	91	8 x Ø 6,0	91	150	10	-	90	34
	071284000CE	101	8 x Ø 6,0	101	150	10	-	90	34
	071285000CE	116	8 x Ø 6,0	116	150	10	-	90	34
Stützenschuhe aufschraubbar rostfrei	071281000RF	71	2 x Bo Ø 10,0	71	80	10	-	184	22
	071283000RF	91	2 x Bo Ø 10,0	91	80	10	-	184	22
Stützenschuhe aufschraubbar	071286000CE	71	8 x Ø 6,0	71	165	30	-	92	47
	071287000CE	81	8 x Ø 6,0	81	165	30	-	92	47
	071288000CE	91	8 x Ø 6,0	91	165	30	-	92	47
	071289000CE	101	8 x Ø 6,0	101	165	30	-	92	47
	071290000CE	121	8 x Ø 6,0	121	165	30	-	92	47
	071291000CE	141	8 x Ø 6,0	141	165	30	-	92	47
Stützenschuhe aufschraubbar rostfrei	071286000RF	71	4 x Scr Ø10,0	71	117	30	-	86	21
	071288000RF	91	4 x Scr Ø10,0	91	117	30	-	86	21
L-Stützenschuhe	071292000CE (pair)	110	8 x Ø 6,0	100	165	10	-	-	18
	071292140CE (pair)	140	8 x Ø 6,0	100	165	10	-	-	18
Schwere Stützenschuhe	071294000CE	71	8 x Ø 6,0	71	165	30	50	142	47
	071295000CE	81	8 x Ø 6,0	81	165	30	50	142	47
	071296000CE	91	8 x Ø 6,0	91	165	30	50	142	47
	071297000CE	101	8 x Ø 6,0	101	165	30	50	142	47
	071298000CE	121	8 x Ø 6,0	121	165	30	50	142	47
	071300000CE	141	8 x Ø 6,0	141	165	30	50	142	47



Continuation of Table A.1 Specifications of the post bases

Post Base				Post		Distances			
Type	Article No.	Size	Fastener	min b	min h	max e	max a	e <sub>F2/F3</sub>	e <sub>F4/F5</sub>
		[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
U-Stützenschuhe Rostfrei	071294000RF	71	8 x Ø 6,0	71	165	-	50	105	64
	071295000RF	81	8 x Ø 6,0	81	165	-	50	105	64
	071296000RF	91	8 x Ø 6,0	91	165	-	50	105	64
	071297000RF	101	8 x Ø 6,0	101	165	-	50	105	64
	071298000RF	121	8 x Ø 6,0	121	165	-	50	105	64
Schwere Stützenschuhe L-Form	071299000CE	70	4 x Ø 6,0	70	120	-	50	-	-
L-Stützenschuhe Rostfrei	071299000RF	70	4 x Ø 6,0	70	120	-	50	-	-
Schwere Stützenschuhe mit Rohrdolle	071304000CE	71	8 x Ø 6,0	71	146	-	50	130	74
	071305000CE	81	8 x Ø 6,0	81	146	-	50	130	74
	071306000CE	115	8 x Ø 6,0	115	146	-	50	130	74
	071307000CE	101	8 x Ø 6,0	101	146	-	50	130	74
	071308000CE	91	8 x Ø 6,0	91	146	-	50	130	74
Verstellbare Schwerlastbetonanker	071310000CE (pair)	40	2 x Bo Ø10,0	80	80	10**	(l=250)*	100	50
Stützenschuh mit durchgehender Dolle	071311000CE		-	80	80	-	100 (l=130)*	-	-
Höhenverstellbarer Stützenschuh	071312000CE		-	80	80	-	160 (l=160)*	-	-
Höhenverstellbarer Stützenschuh	071313000CE		-	80	80	-	260	-	-
Leichte Stützenschuhe Typ B; U-Form	071314000CE	71	8 x Ø 6,0	71	165	-	50	119	70
	071315000CE	81	8 x Ø 6,0	81	165	-	50	119	70
	071316000CE	91	8 x Ø 6,0	91	165	-	50	119	70
	071317000CE	101	8 x Ø 6,0	101	165	-	50	119	70
	071318000CE	121	8 x Ø 6,0	121	165	-	50	119	70
	071320000CE	141	8 x Ø 6,0	141	165	-	50	119	70
Leichte Stützenschuhe Typ B; L-Form	071319000CE	70	4 x Ø 6,0	70	165	-	50	-	-
Leichte Stützenschuhe Typ B; U-Form	071323000CE	75	8 x Ø 6,0	75	165	-	50	122	70
Leichte Stützenschuhe Typ B; U-Form	071325000CE	61-140	-	61-140	70	-	50	-	-
Seitenverstellbare Stützenschuhe	071326000CE	60-140	-	60-140	70	-	104,5	-	-
Schwerer Stützen- schuh mit Rohrdolle	071328000CE		-	80	80	-	129	-	-

\* depth [mm] in foundation of adjustable post base set in concrete

\*\* 10 mm clearance between the end grain of the timber post and the foundation

Continuation of Table A.1 Specifications of the post bases

Post Base				Post		Distances			
Type	Article No.	Size	Fastener	min b	min h	max e	max a	e <sub>F2/F3</sub>	e <sub>F4/F5</sub>
		[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Höhenverstellbare Stützenschuhe	071329000CE		-	70	80	-	125-190	-	-
Seiten- und Höhenverstellbare Stützenschuhe	071331000CE	60-140	-	60-140	70	-	135 - 215	-	-
Seiten- und Höhenverstellbare Stützenschuhe	071332000CE	60-140	-	60-140	70	-	135 - 215 (l=125)*	-	-
Höhenverstellbare Stützenschuhe mit Steg	071333000CE	80	4 x Do Ø8,0	80	200	-	135 - 215	270	230
Schwere Pfostenanker H-Form	071335000CE	71	2 x Bo Ø10,0	71	80	10	50	190	65
	071337000CE	91	2 x Bo Ø10,0	91	80	10	50	190	65
	071338000CE	101	2 x Bo Ø10,0	101	80	10	50	190	65
	071339000CE	121	2 x Bo Ø10,0	121	80	10	50	190	65
	071340000CE	116	2 x Bo Ø10,0	116	80	10	50	190	65
	071342000CE	141	2 x Bo Ø10,0	141	80	10	50	190	65
Schwere Pfostenanker H-Form	071335006CE	71	2 x Bo Ø10,0	71	80	10	50	190	75
	071337006CE	91	2 x Bo Ø10,0	91	80	10	50	190	75
	071338006CE	101	2 x Bo Ø10,0	101	80	10	50	190	75
	071339006CE	121	2 x Bo Ø10,0	121	80	10	50	190	75
	071340006CE	116	2 x Bo Ø10,0	116	80	10	50	190	75
	071342006CE	141	2 x Bo Ø10,0	141	80	10	50	190	75
Schwere Pfostenanker, H-Form	071337000RF	91	2 x Bo Ø10,0	91	80	10	50	190	65
Schwere Pfostenanker H-Form	071337806CE	91	2 x Bo Ø10,0	91	80	10	100	240	90
	071338806CE	101	2 x Bo Ø10,0	101	80	10	100	240	90
	071339806CE	116	2 x Bo Ø10,0	116	80	10	100	240	90
	071340806CE	121	2 x Bo Ø10,0	121	80	10	100	240	90
	071342806CE	141	2 x Bo Ø10,0	141	80	10	100	240	90
Schwere Pfostenanker, H-Form	071339808CE	116	2 x Bo Ø10,0	116	80	10	100	300	100
	071340808CE	121	2 x Bo Ø10,0	121	80	10	100	300	100
	071342808CE	141	2 x Bo Ø10,0	141	80	10	100	300	100
Aufschraubbare, verstellbare Stützenschuhe	071345000CE	0-90	6 x Ø 6,0	0-90	169	10	-	0	-
Aufschraubbare, verstellbare Stützenschuhe	071346000CE	70-140	6 x Ø 6,0	70-140	169	10	-	0	-
Stützenschuhe	071354000CE	71	8 x Ø 6,0	71	165	30	50	142	47
	071356000CE	91	8 x Ø 6,0	91	120	30	20	142	47

\* depth l[mm] in foundation of adjustable post base set in concrete

Table A.2 Specifications of the metal fasteners according to EN 14592

Fastener type	Size			Material	Finish
	Diameter	Length	Threaded length		
Screws	6,0 mm	min 50 mm	min 24 mm	$f_{u,k} \geq 400 \text{ N/mm}^2$	Galvanic zinc coating (zinc coating Fe/Zn 25c)
Screws	10,0 mm	min 60 mm	min 40 mm	$f_{u,k} \geq 400 \text{ N/mm}^2$	Galvanic zinc coating (zinc coating Fe/Zn 25c)
Bolts	10,0 mm			$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating (zinc coating Fe/Zn 25c or Fe/Zn 15/DSP)
Dowels	8,0 mm; 10,0 mm			$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating (zinc coating Fe/Zn 25c or Fe/Zn 15/DSP).

The load-carrying-capacities of the metal fasteners were calculated according to Eurocode 5 for lateral loads. The contribution to the load-carrying capacity due to the rope effect was considered according to Eurocode 5.

**Annex B**  
**Characteristic load-carrying capacities**

Table B.1 Characteristic load-carrying capacities for post bases  $F_{i,Rk}$  [kN]

Post base	$F_1$ (Compression)			$F_1$ (Tension)		$F_2/F_3$			$F_4/F_5$	
	Timber	Steel		Timber	Steel	Timber	Steel		Timber	Steel
071274000CE	31,3	22,4	-	2,36	6,18	2,71	1,28	2,02	2,97	2,73
071276000CE	39,7	24,9	-	2,39	3,90	2,75	1,16	2,02	2,97	2,73
071277000CE	44,9	24,9	-	2,39	3,17	2,75	1,03	2,02	2,97	2,73
071278000CE	50,2	24,9	-	2,39	2,67	2,75	1,03	2,02	2,97	2,73
071279000CE	55,4	24,9	-	2,39	2,31	2,75	1,03	2,02	2,97	2,73
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071275000CE	28,7	25,4	-	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	-	-	-	-	-	-	-
071280000CE	51,9	34,4	-	28,5	33,4	14,0	4,27	3,63	2,22	7,03
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071281000CE	7,08	-	47,2	2,36	14,2	9,44	2,37	-	4,43	1,37
071283000CE	9,44	-	47,2	4,72	14,2	9,44	2,37	-	4,43	1,37
071284000CE	9,44	-	47,2	4,72	14,2	9,44	2,37	-	4,43	1,37
071285000CE	9,44	-	47,2	4,72	14,2	9,44	2,37	-	4,43	1,37
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,2}$
071281000RF	24,7	-	45,3	6,63	13,3	5,58	1,08	-	5,74	1,77
071283000RF	24,7	-	45,3	6,63	13,3	5,58	1,08	-	5,74	1,77
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,2}$
071286000CE	8,67	14,1	-	5,38	4,12	11,6	2,36	-	3,67	2,94
071287000CE	8,67	14,1	-	5,38	3,47	11,6	1,49	-	3,67	2,94
071288000CE	8,67	14,1	-	5,38	3,00	11,6	1,72	-	3,67	2,94
071289000CE	8,67	14,1	-	5,38	2,65	11,6	1,14	-	3,67	2,94
071290000CE	8,67	14,1	-	5,38	2,14	11,6	0,92	-	3,67	2,94
071291000CE	8,67	14,1	-	5,38	1,79	11,6	0,77	-	3,67	2,94
	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071286000RF	7,64	10,5	-	7,14	2,95	5,41	1,86	-	1,03	2,86
071288000RF	7,64	10,5	-	7,14	2,16	5,41	1,36	-	1,03	2,86
	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071292000CE	8,67	-	29,9	4,95	1,57	1,53	10,4	-	-	-
071292140CE	8,93	-	28,3	5,68	1,48	1,56	11,1	-	-	-
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,2}$	-	-	-

Continuation of Table B.1 Characteristic load-carrying capacities for post bases  $F_{i,Rk}$  [kN]

Post base	$F_1$ (Compression)			$F_1$ (Tension)		$F_2/F_3$			$F_4/F_5$	
	Timber	Steel		Timber	Steel	Timber	Steel		Timber	Steel
071294000CE	8,93	5,65	-	5,54	5,65	11,9	1,51	-	3,85	2,80
071295000CE	8,93	4,67	-	5,54	4,67	11,9	1,51	-	3,85	2,80
071296000CE	8,93	3,99	-	5,54	3,99	11,9	1,51	-	3,85	2,80
071297000CE	8,93	3,48	-	5,54	3,48	11,9	1,51	-	3,85	2,80
071298000CE	8,93	2,77	-	5,54	2,77	11,9	1,26	-	3,85	2,80
071300000CE	8,93	2,30	-	5,54	2,30	11,9	1,05	-	3,85	2,80
	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071294000RF	57,2	28,0	-	5,00	2,09	7,49	1,37	-	2,72	2,25
071295000RF	64,0	28,0	-	5,00	1,74	7,49	1,08	-	2,72	2,25
071296000RF	70,8	28,0	-	5,00	1,49	7,49	0,93	-	2,72	2,25
071297000RF	77,6	28,0	-	5,00	1,31	7,49	0,93	-	2,72	2,25
071298000RF	91,3	28,0	-	5,00	1,05	7,49	0,93	-	2,72	2,25
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071299000CE	55,7	37,5	-	2,89	4,39	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	-	-	-	-	-
071299000RF	56,1	37,8	-	2,98	4,68	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	-	-	-	-	-
071304000CE	57,7	55,8	71,0	2,89	9,96	10,1	1,69	-	3,34	3,34
071305000CE	63,0	58,6	71,0	2,89	7,92	10,1	1,27	-	3,34	3,34
071306000CE	80,8	58,6	71,0	2,89	4,68	11,6	1,18	-	3,34	3,34
071307000CE	73,5	58,6	71,0	2,89	5,78	11,6	1,18	-	3,34	3,34
071308000CE	68,2	58,6	71,0	2,89	6,58	11,6	1,18	-	3,34	3,34
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071310000CE	28,4	-	72,9	28,4	124,4	9,20	17,6	-	6,9	4,13
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071311000CE	61,2	30,1	-	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	-	-	-	-	-	-	-
071312000CE	109	-	33,5	-	-	-	-	-	-	-
	$\gamma_{M,T}$	-	$\gamma_{M,1}$	-	-	-	-	-	-	-
071313000CE	109	-	18,5	-	-	-	-	-	-	-
	$\gamma_{M,T}$	-	$\gamma_{M,1}$	-	-	-	-	-	-	-
071314000CE	55,7	36,3	-	5,34	4,41	8,25	1,95	-	3,56	3,56
071315000CE	62,0	36,3	-	5,34	3,65	8,25	1,61	-	3,56	3,56
071316000CE	68,3	36,3	-	5,34	3,12	8,25	1,38	-	3,56	3,56
071317000CE	74,6	36,3	-	5,34	2,72	8,25	1,38	-	3,56	3,56
071318000CE	87,2	36,3	-	5,34	2,17	8,25	1,38	-	3,56	3,56
071320000CE	99,8	36,3	-	5,34	1,81	8,25	1,38	-	3,56	3,56
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$

Continuation of Table B.1 Characteristic load-carrying capacities for post bases  $F_{i,Rk}$  [kN]

Post base	$F_1$ (Compression)			$F_1$ (Tension)		$F_2/F_3$			$F_4/F_5$	
	Timber	Steel		Timber	Steel	Timber	Steel		Timber	Steel
071319000CE	55,1	36,3	-	2,64	4,50	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	-	-	-	-	-
071323000CE	58,2	36,3	-	5,44	4,07	8,25	1,67	-	3,56	3,56
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071325000CE	22,1	13,8	-	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	-	-	-	-	-	-	-
071326000CE	22,1	11,8	-	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	-	-	-	-	-	-	-	-
071328000CE	62,9	48,5	68,6	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	-	-	-	-	-	-	-
071329000CE	64,6	26,9	30,6	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	-	-	-	-	-	-	-
071331000CE	22,1	13,8	24,1	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	-	-	-	-	-	-	-
071332000CE	22,1	13,8	24,1	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	-	-	-	-	-	-	-
071333000CE	57,5	-	26,7	16,5	2,97	7,95	0,48	-	1,40	0,55
	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,T}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$
071335000CE	23,6	-	79,5	12,7	81,8	6,53	-	10,2	3,65	2,68
071337000CE	23,6	-	79,5	12,7	81,8	8,37	-	10,2	3,65	2,68
071338000CE	23,6	-	79,5	12,7	81,8	9,29	-	10,2	3,65	2,68
071339000CE	23,6	-	79,5	12,7	81,8	11,1	-	10,2	3,65	2,68
071340000CE	23,6	-	79,5	12,7	81,8	10,7	-	10,2	3,65	2,68
071342000CE	23,6	-	79,5	12,7	81,8	13,0	-	10,2	3,65	2,68
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071335006CE	25,3	-	112,1	13,4	98,2	6,53	-	12,6	3,83	3,63
071337006CE	25,3	-	112,1	13,6	98,2	8,37	-	12,6	3,83	3,63
071338006CE	25,3	-	112,1	13,6	98,2	9,29	-	12,6	3,83	3,63
071339006CE	25,3	-	112,1	13,6	98,2	11,1	-	12,6	3,83	3,63
071340006CE	25,3	-	112,1	13,6	98,2	10,7	-	12,6	3,83	3,63
071342006CE	25,3	-	112,1	13,6	98,2	13,0	-	12,6	3,83	3,63
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071337000RF	23,6	-	76,9	12,7	100	8,37	-	9,64	3,65	2,51
	$\gamma_{M,C}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,T}$	$\gamma_{M,0}$

Continuation of Table B.1 Characteristic load-carrying capacities for post bases  $F_{i,Rk}$  [kN]

Post base	$F_1$ (Compression)		$F_1$ (Tension)		$F_2/F_3$			$F_4/F_5$		
	Timber	Steel	Timber	Steel	Timber	Steel		Timber	Steel	
071337806CE	25,3	-	71,0	13,6	98,2	8,37	-	9,4	3,27	2,69
071338806CE	25,3	-	71,0	13,6	98,2	9,29	-	9,4	3,27	2,69
071339806CE	25,3	-	71,0	13,6	98,2	10,7	-	9,4	3,27	2,69
071340806CE	25,3	-	71,0	13,6	98,2	11,1	-	9,4	3,27	2,69
071342806CE	25,3	-	71,0	13,6	98,2	13,0	-	9,4	3,27	2,69
	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071339808CE	36,2	-	176	19,6	133	12,9	-	18,3	6,14	5,82
071340808CE	36,2	-	176	19,6	133		-	18,3	6,14	5,82
071342808CE	36,2	-	176	19,6	133	15,6	-	18,3	6,14	5,82
	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,2}$	$\gamma_{M,T}$	-	$\gamma_{M,1}$	$\gamma_{M,T}$	$\gamma_{M,0}$
071345000CE	8,25	-	74,1	8,25	3,44	2,53	-	-	-	-
071346000CE	8,25	-	74,1	8,25	2,28	2,53	-	-	-	-
	$\gamma_{M,T}$	-	$\gamma_{M,2}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	-	-	-	-
071354000CE	8,25	3,54	-	5,12	3,54	11,0	0,85	-	3,85	2,21
071356000CE	8,25	2,56	-	5,12	2,56	11,0	0,85	-	3,85	2,21
	$\gamma_{M,C}$	$\gamma_{M,00}$	-	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,C}$	$\gamma_{M,0}$	-	$\gamma_{M,T}$	$\gamma_{M,0}$

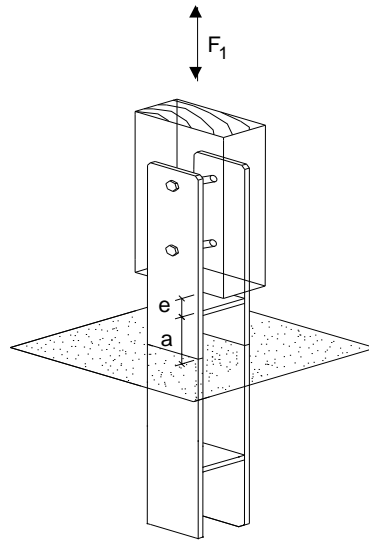
$\gamma_{M,T}$  = partial factor for solid timber according to EN 1995-1-1 and national annex

$\gamma_{M,C}$  = partial factor for connections according to EN 1995-1-1 and national annex

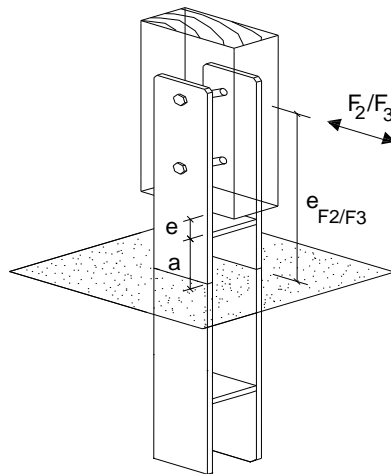
$\gamma_{M,0}$ ;  $\gamma_{M,1}$ ;  $\gamma_{M,2}$  = partial factor according to EN 1993-1-1 and national annex

Definitions of forces, their directions and eccentricity

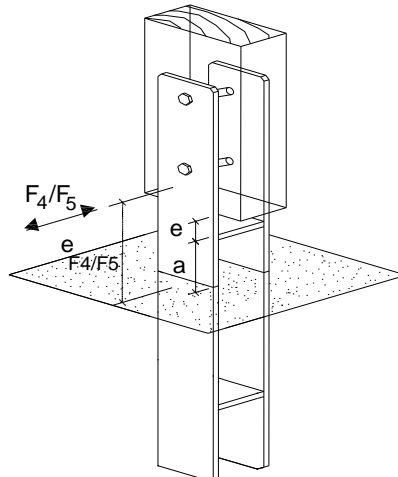
- Force  $F_1$ : tensile or compression load



- Force  $F_2 / F_3$ : horizontal load parallel to the side plates of the post base and perpendicular to the fasteners



- Force  $F_4 / F_5$ : horizontal load perpendicular to the side plates of the post base and parallel to the fasteners





### Acting forces

- $F_1$  axial force (tension or compression) acting along the central axis of the joint
- $F_2$  and  $F_3$  horizontal force parallel to the side plates of the post base acting with the lever arm  $e_{F_2/F_3}$  above the foundation
- $F_4$  and  $F_5$  horizontal force perpendicular to the side plates of the post base acting with the lever arm  $e_{F_4/F_5}$  above the foundation

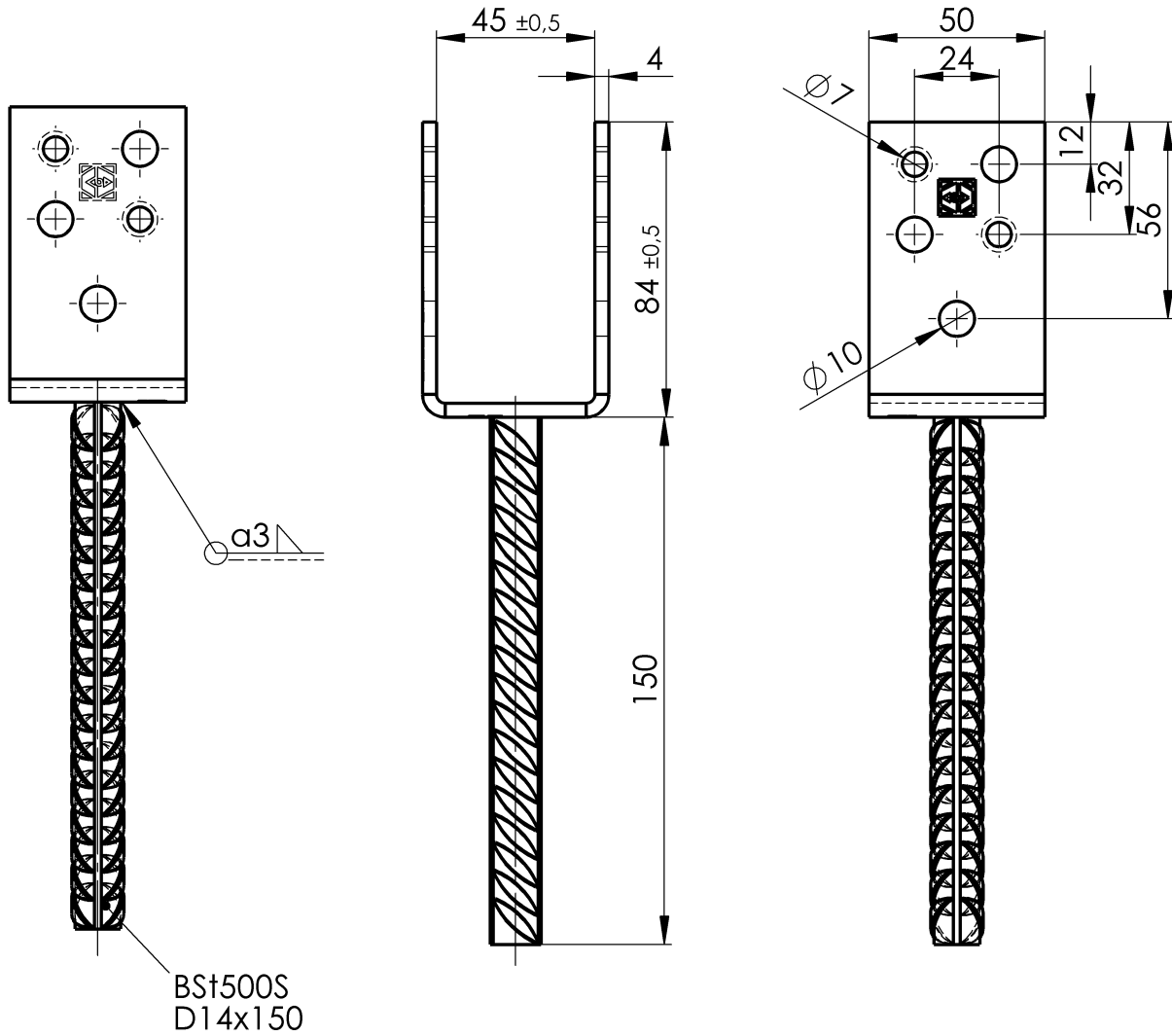
### Combined forces

If the forces  $F_1$  and  $F_2/F_3$  or  $F_4/F_5$  act at the same time, the following inequality shall be fulfilled:

$$\sum \frac{F_{i,Ed}}{F_{i,Rd}} \leq 1$$

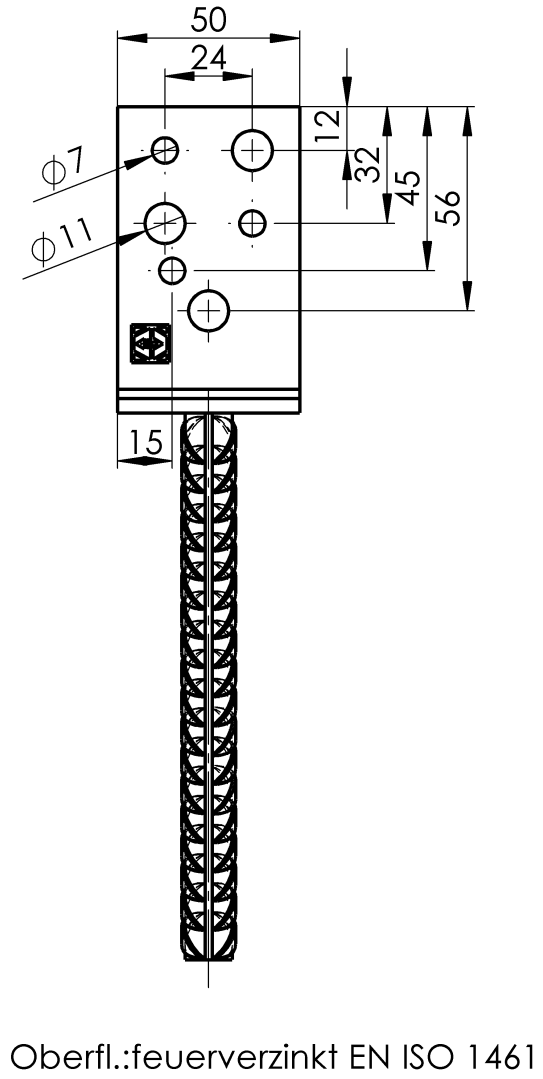
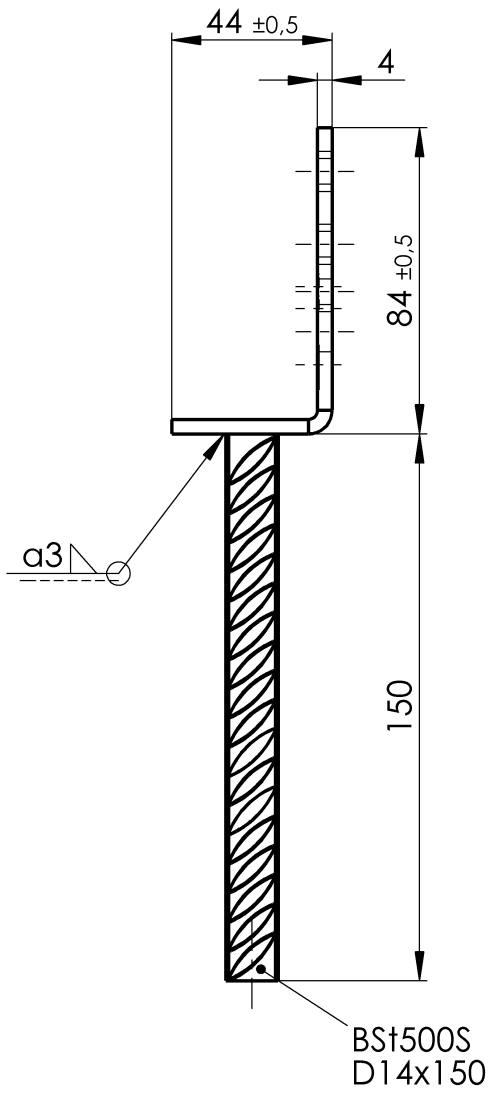
The forces  $F_2$  and  $F_3$  or  $F_4$  and  $F_5$  are forces with opposite direction. Therefore only one force  $F_2$  or  $F_3$ , and  $F_4$  or  $F_5$ , respectively, is able to act simultaneously with  $F_1$ .

B.1 Leichter Stützenschuh Typ A 071274000CE

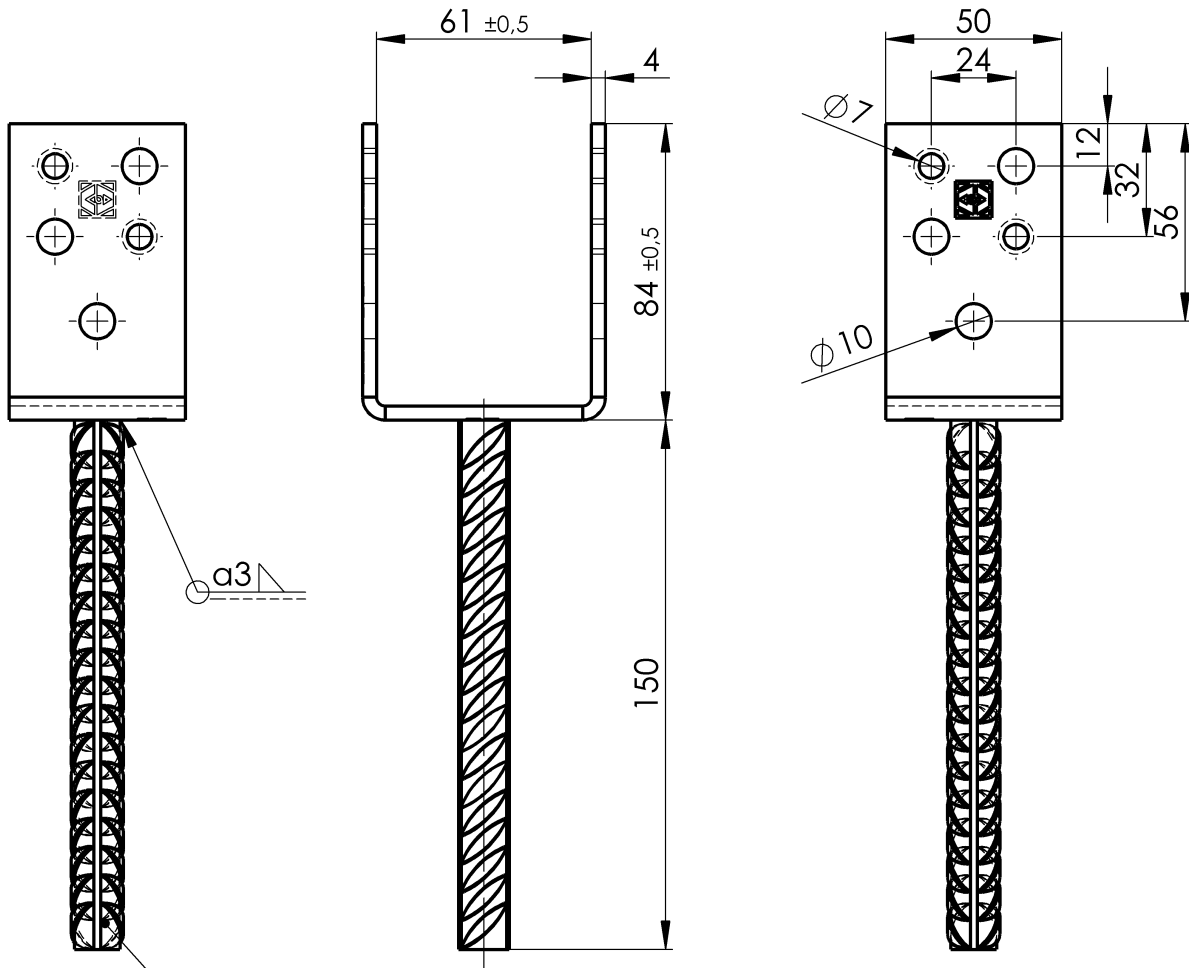


Oberfl.: feuerverzinkt EN ISO 1461

B.2 Leichter Stützenschuh Typ A, L-Form 071275000CE



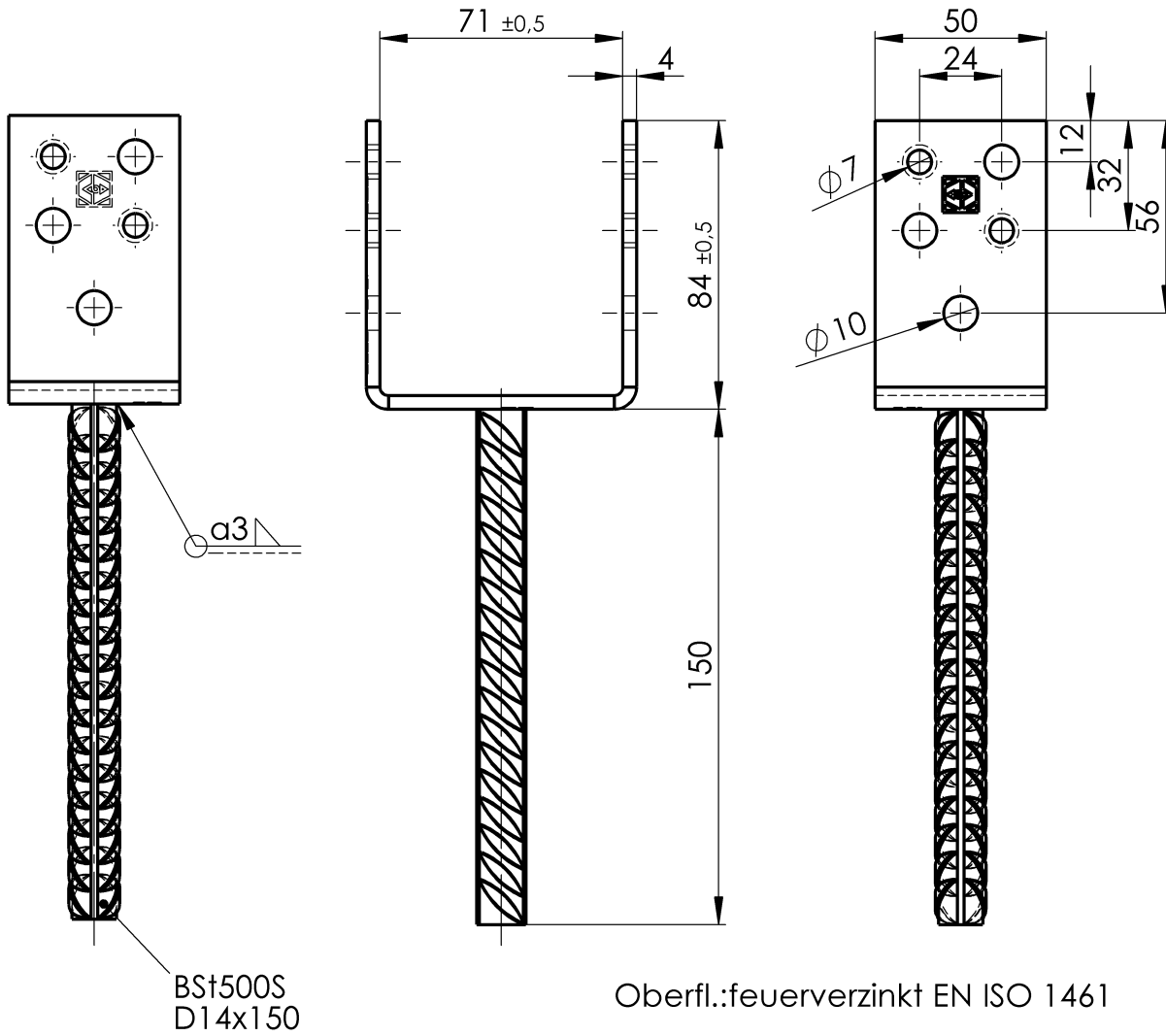
B.3 Leichter Stützenschuh Typ A 071276000CE



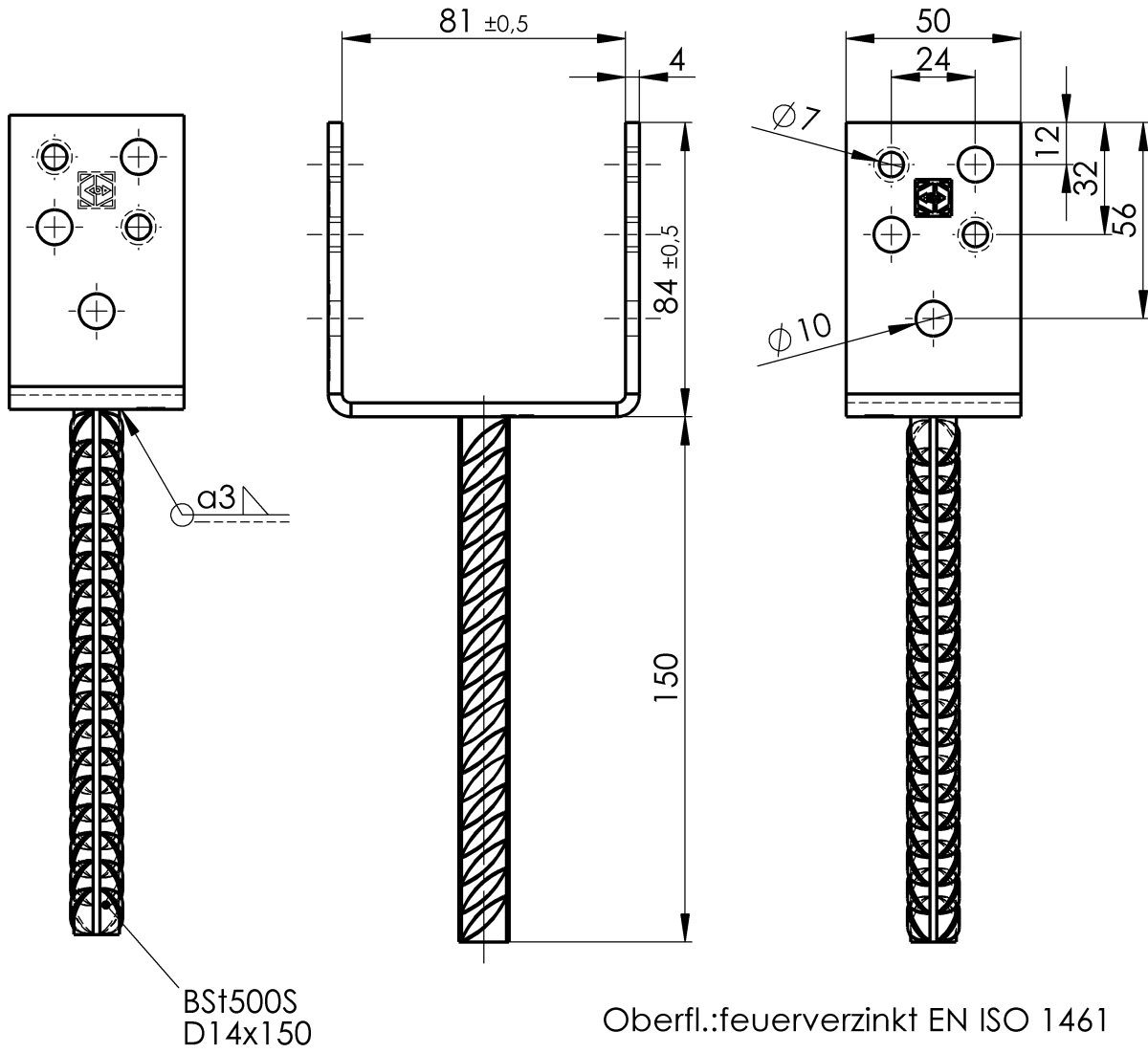
BSf500S  
D14x150

Oberfl.: feuerverzinkt EN ISO 1461

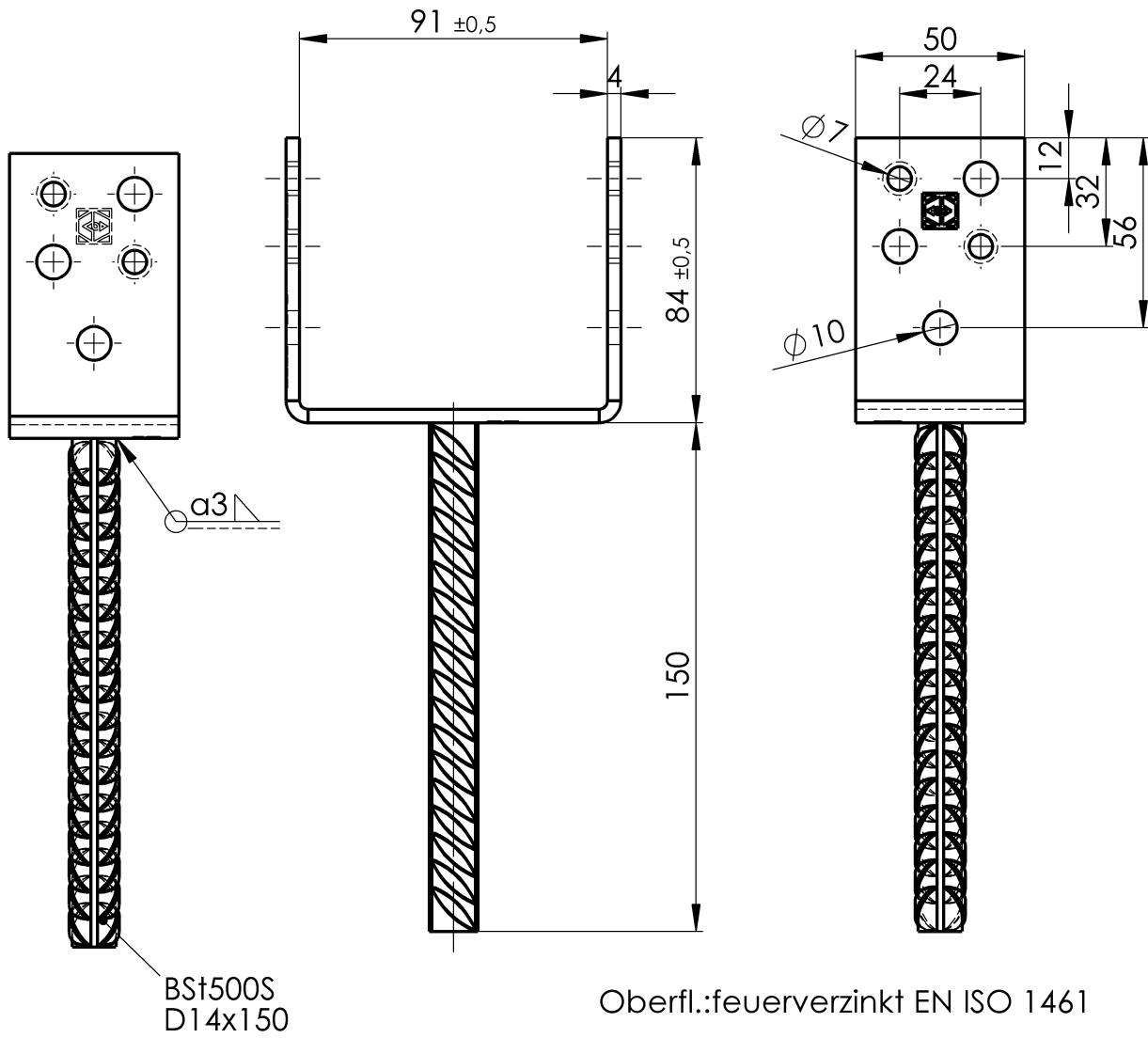
B.4 Leichter Stützenschuh Typ A 071277000CE



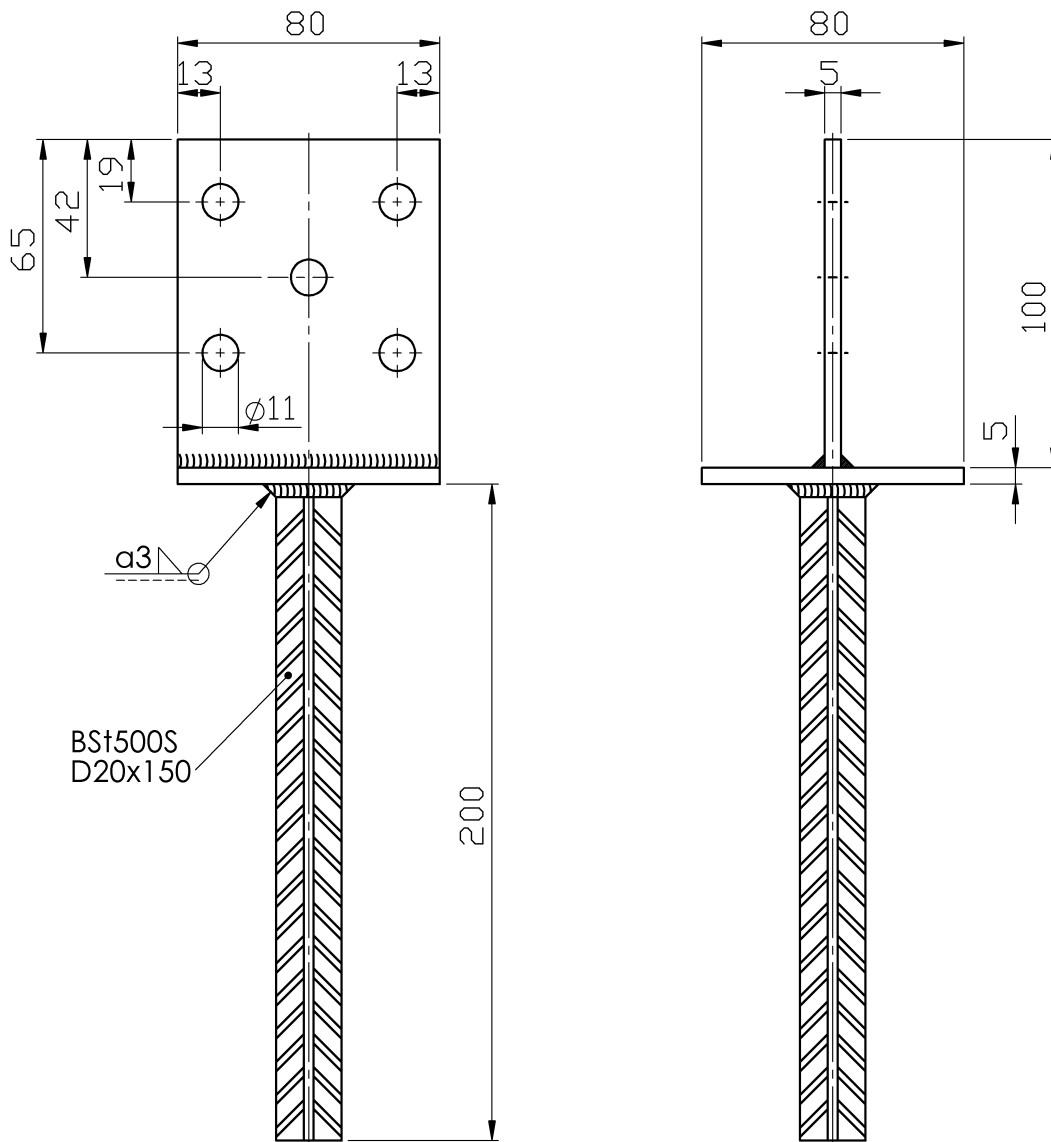
B.5 Leichter Stützenschuh Typ A 071278000CE



B.6 Leichter Stützenschuh Typ A 071279000CE



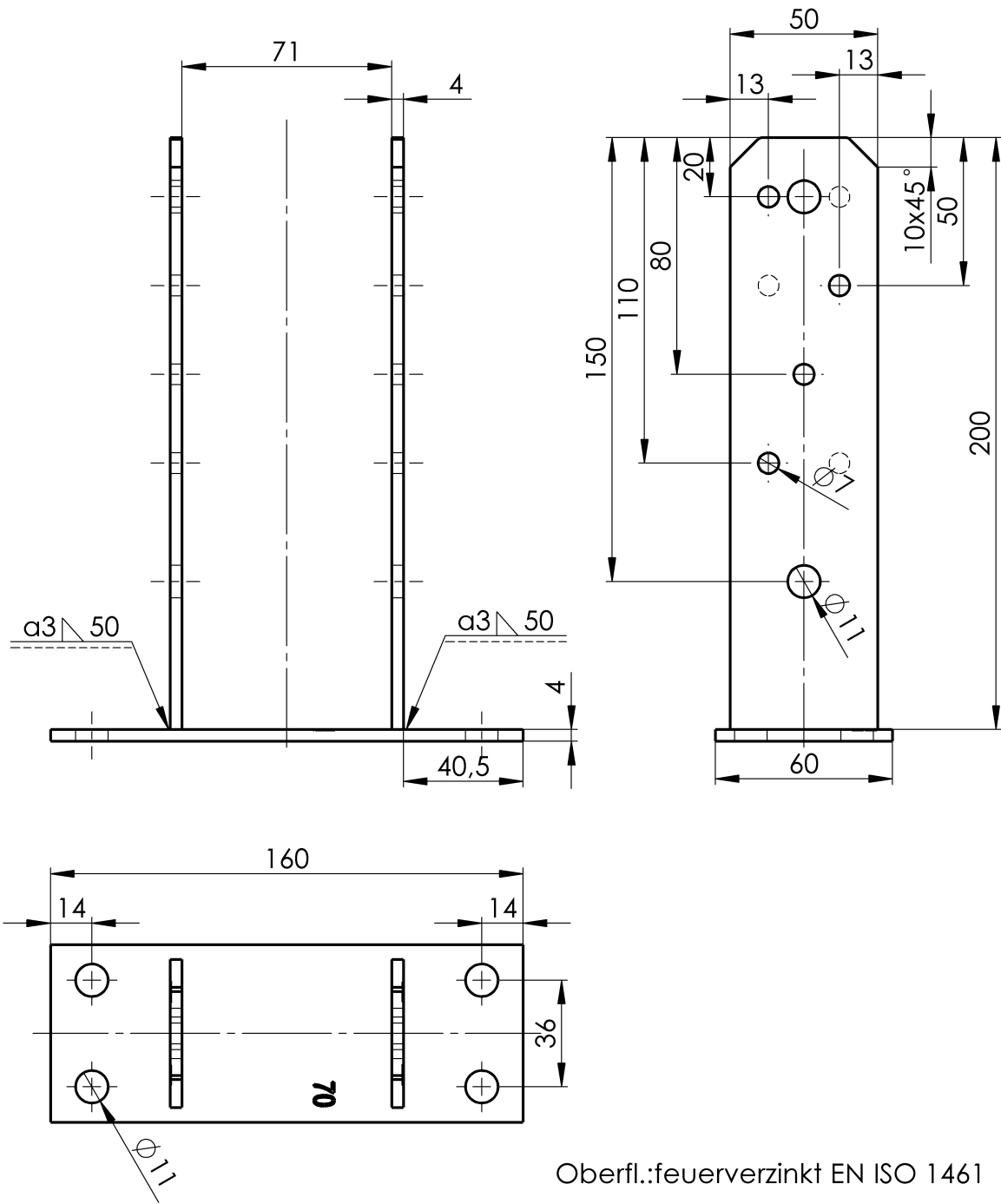
B.7 Leichte Stützenschuhe mit Steg 071280000CE



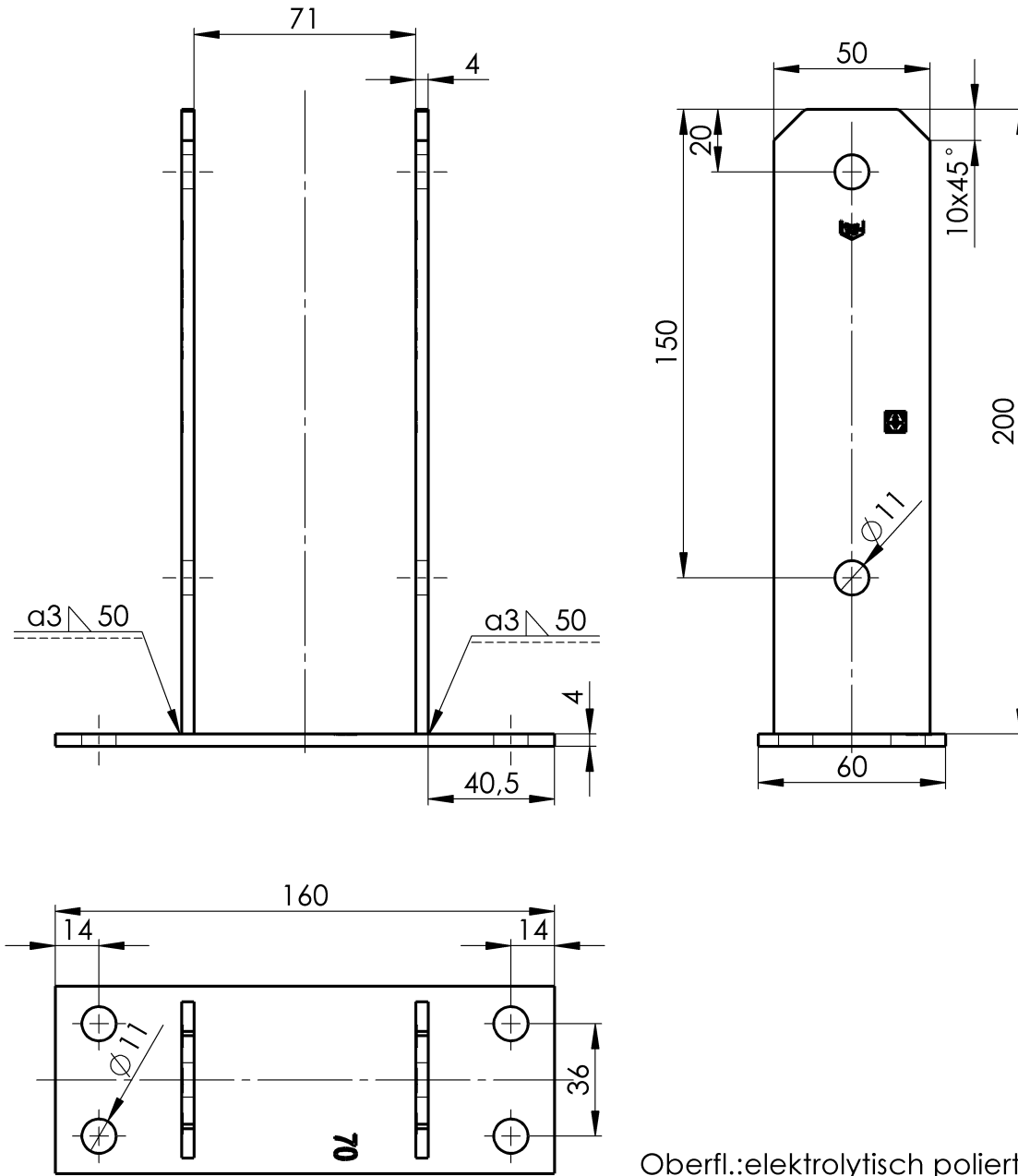
Oberfl.: feuerverzinkt EN ISO 1461



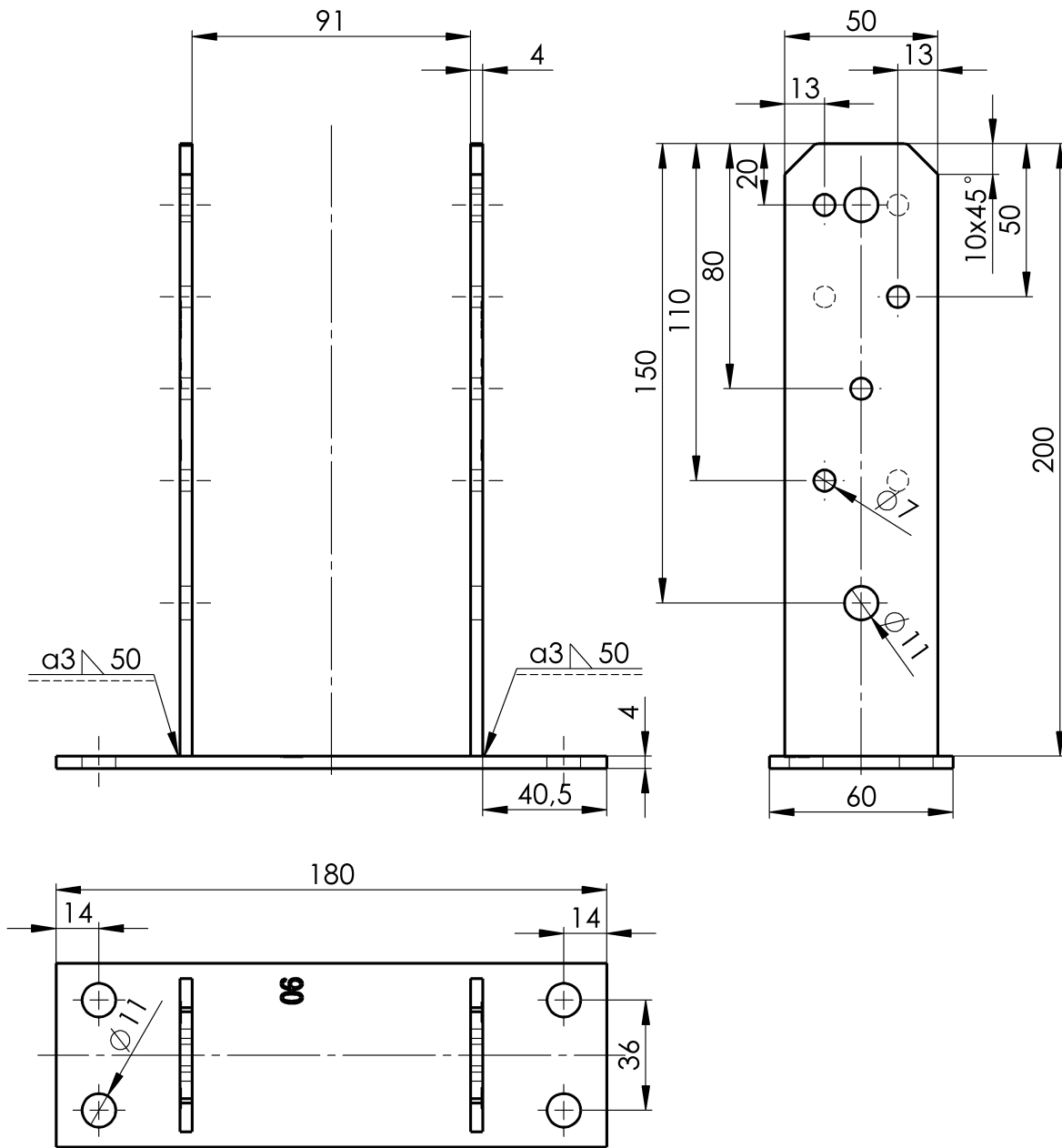
B.8 Stützenschuh aufschraubbar 071281000CE



B.9 Stützenschuh aufschraubbar, rostfrei 071281000RF CE

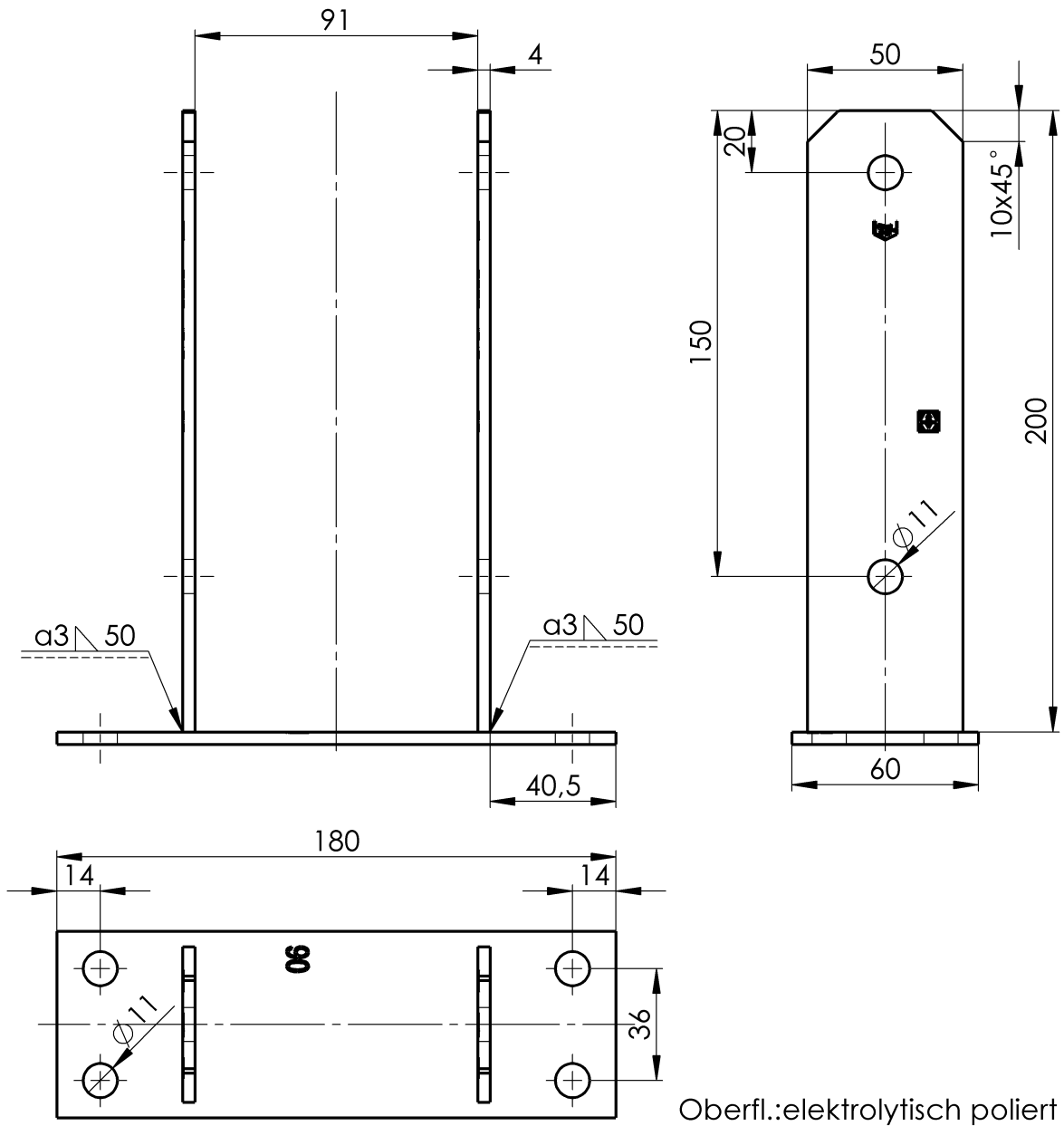


B.10 Stützenschuh aufschraubbar 071283000CE

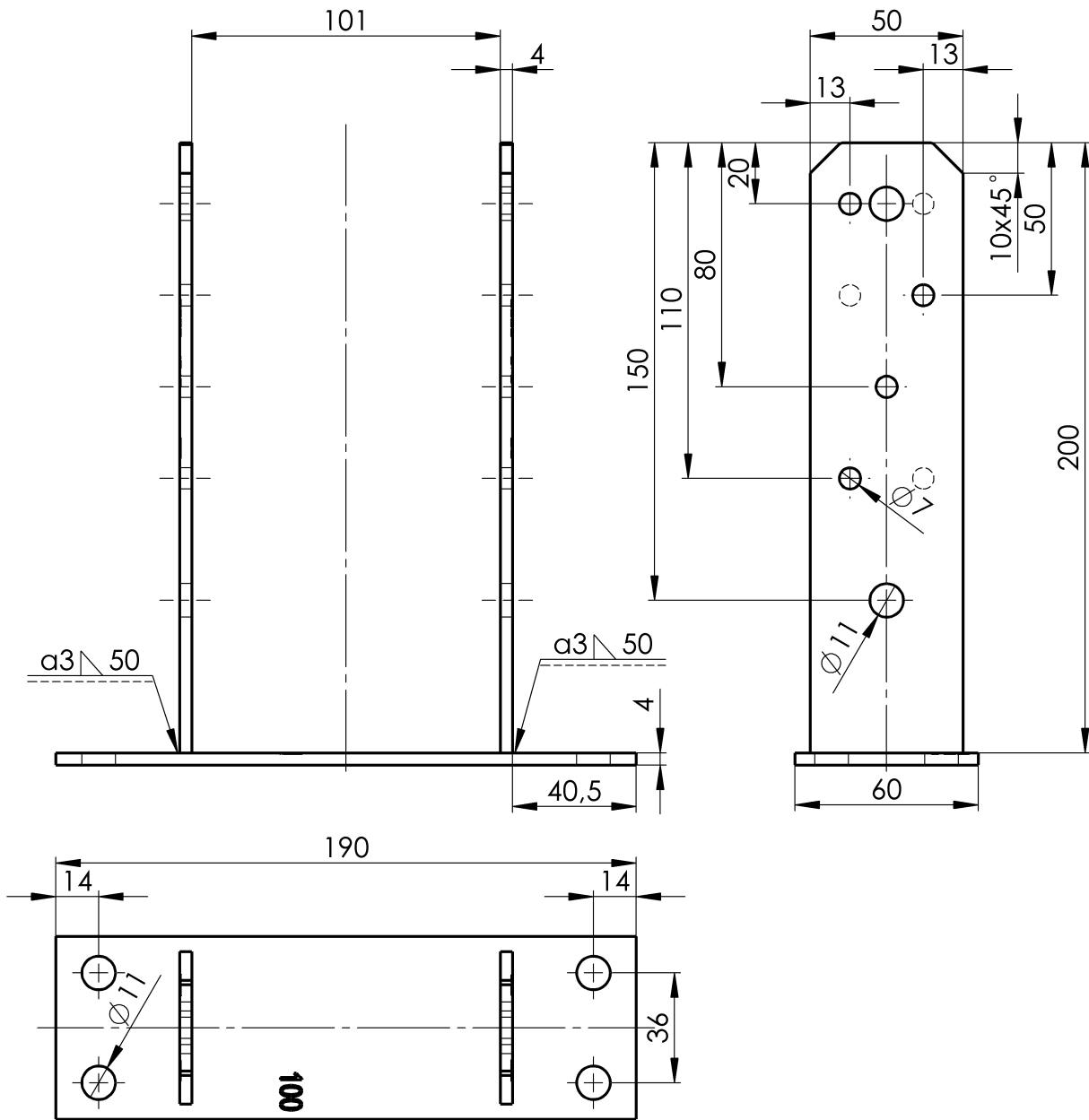


Oberfl.: feuerverzinkt EN ISO 1461

B.11 Stützenschuh aufschraubbar, rostfrei 071283000RF CE

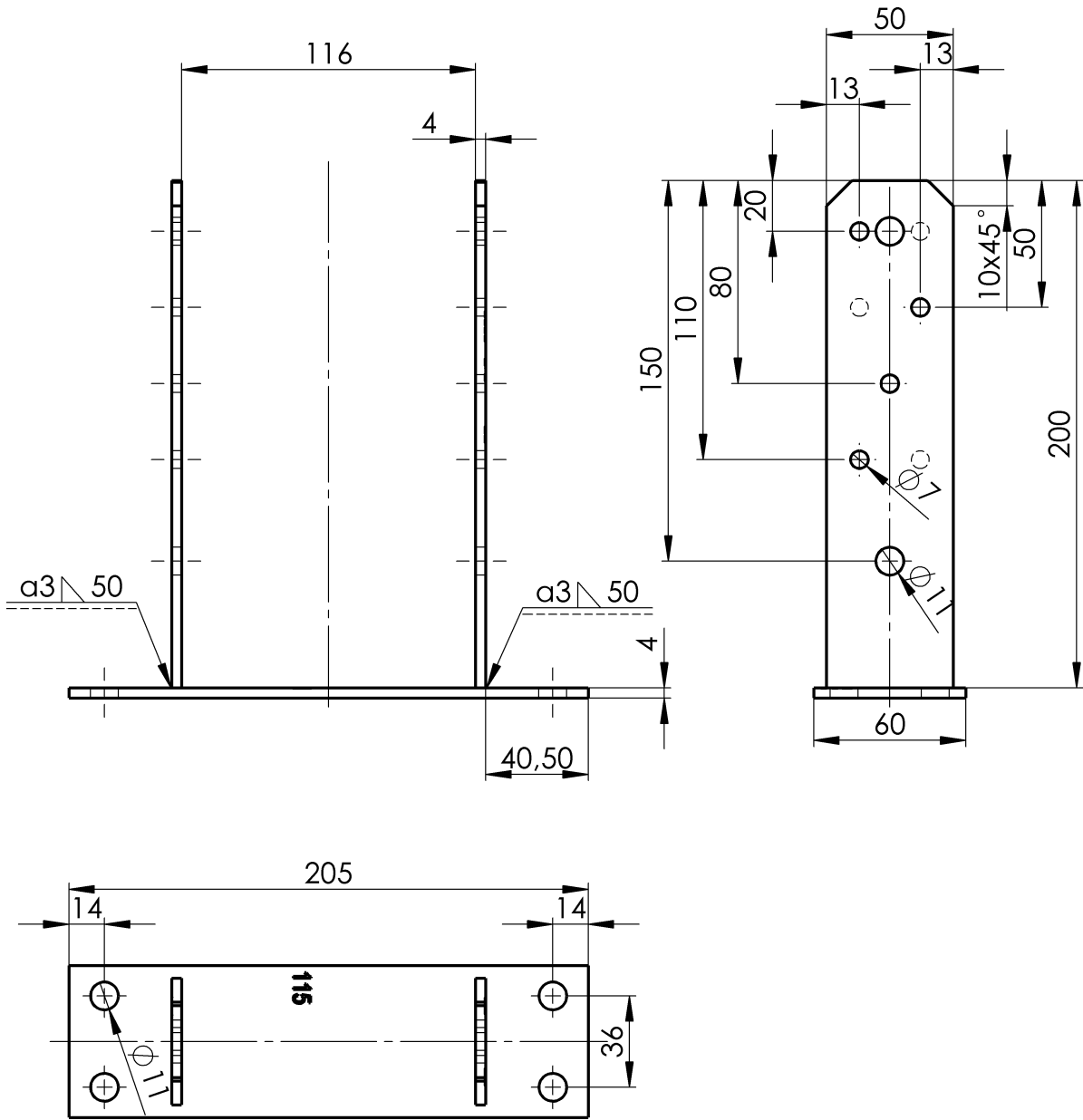


B.12 Stützenschuh aufschraubbar 071284000CE



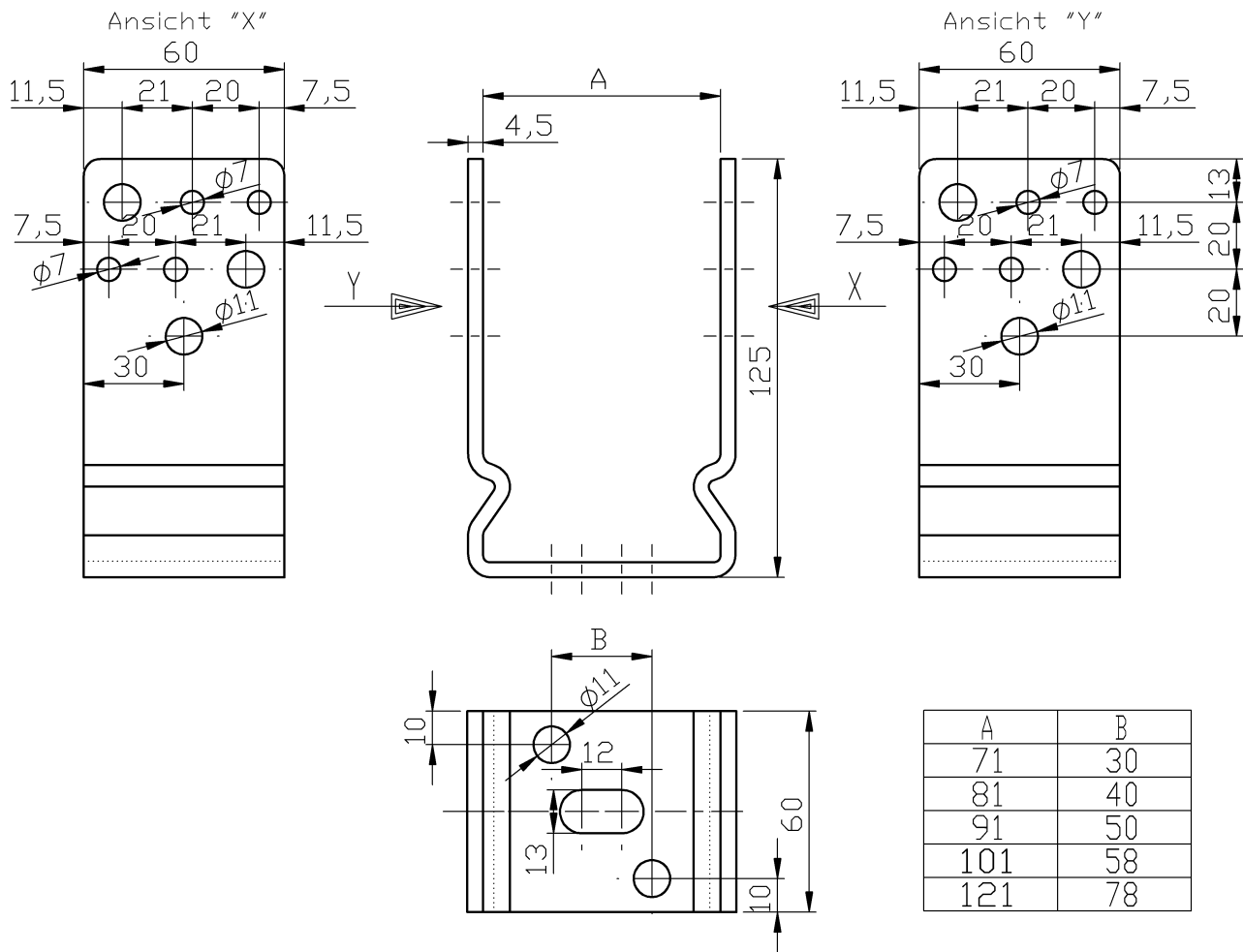
Oberfl.: feuerverzinkt EN ISO 1461

B.13 Stützenschuh aufschraubbar 071285000CE



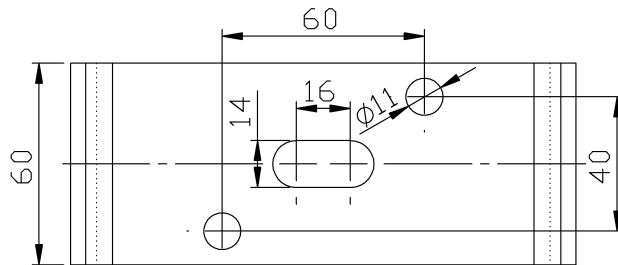
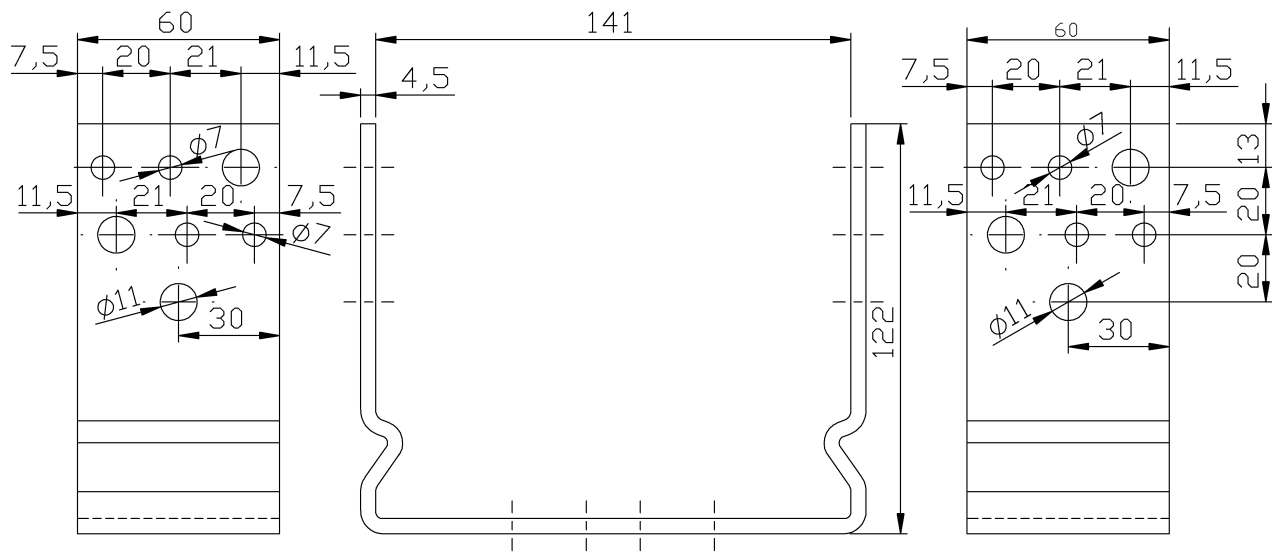
Oberfl.: feuerverzinkt EN ISO 1461

B.14 Stützenschuhe aufschraubbar 071286000CE-071290000CE



Oberfl.: feuerverzinkt EN ISO 1461

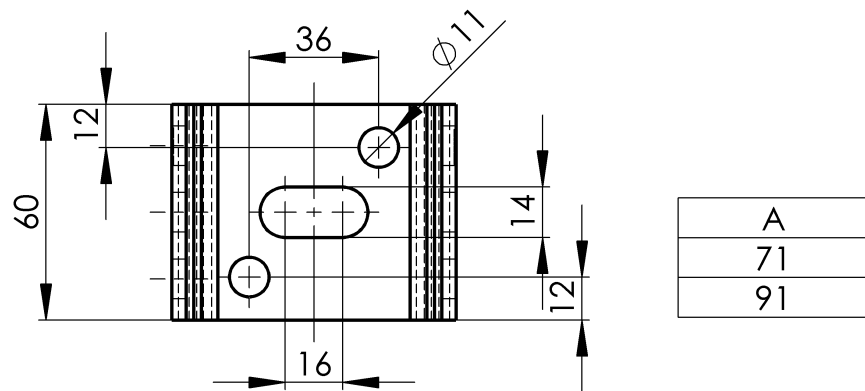
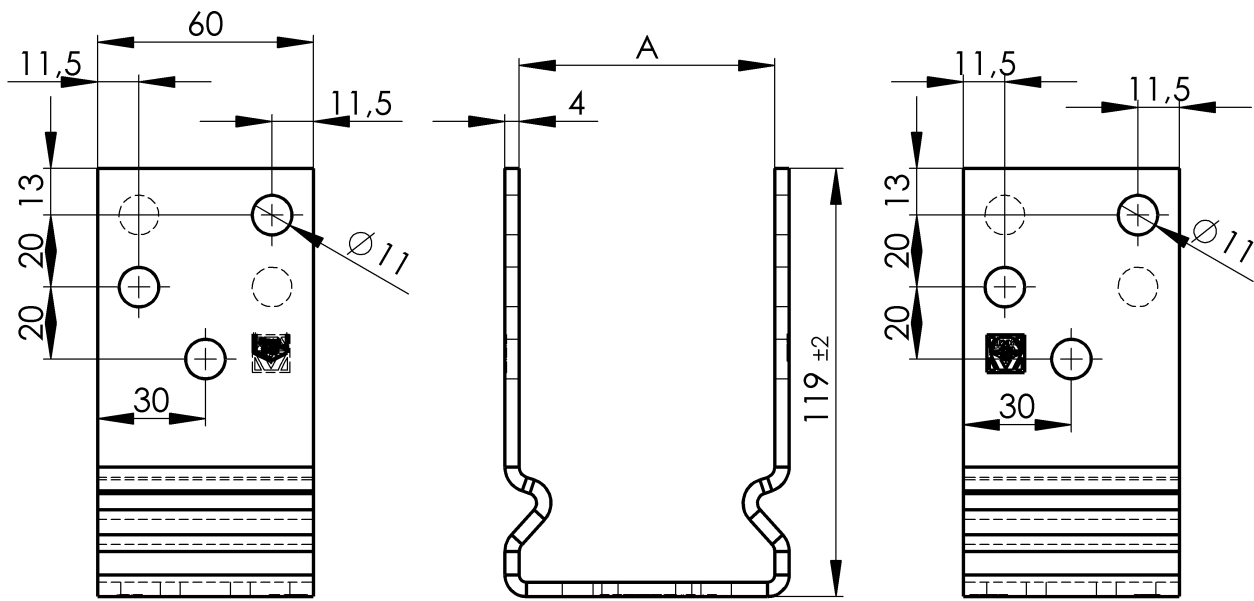
B.15 Stützenschuhe aufschraubbar 071291000CE



Oberfl.: feuerverzinkt EN ISO 1461

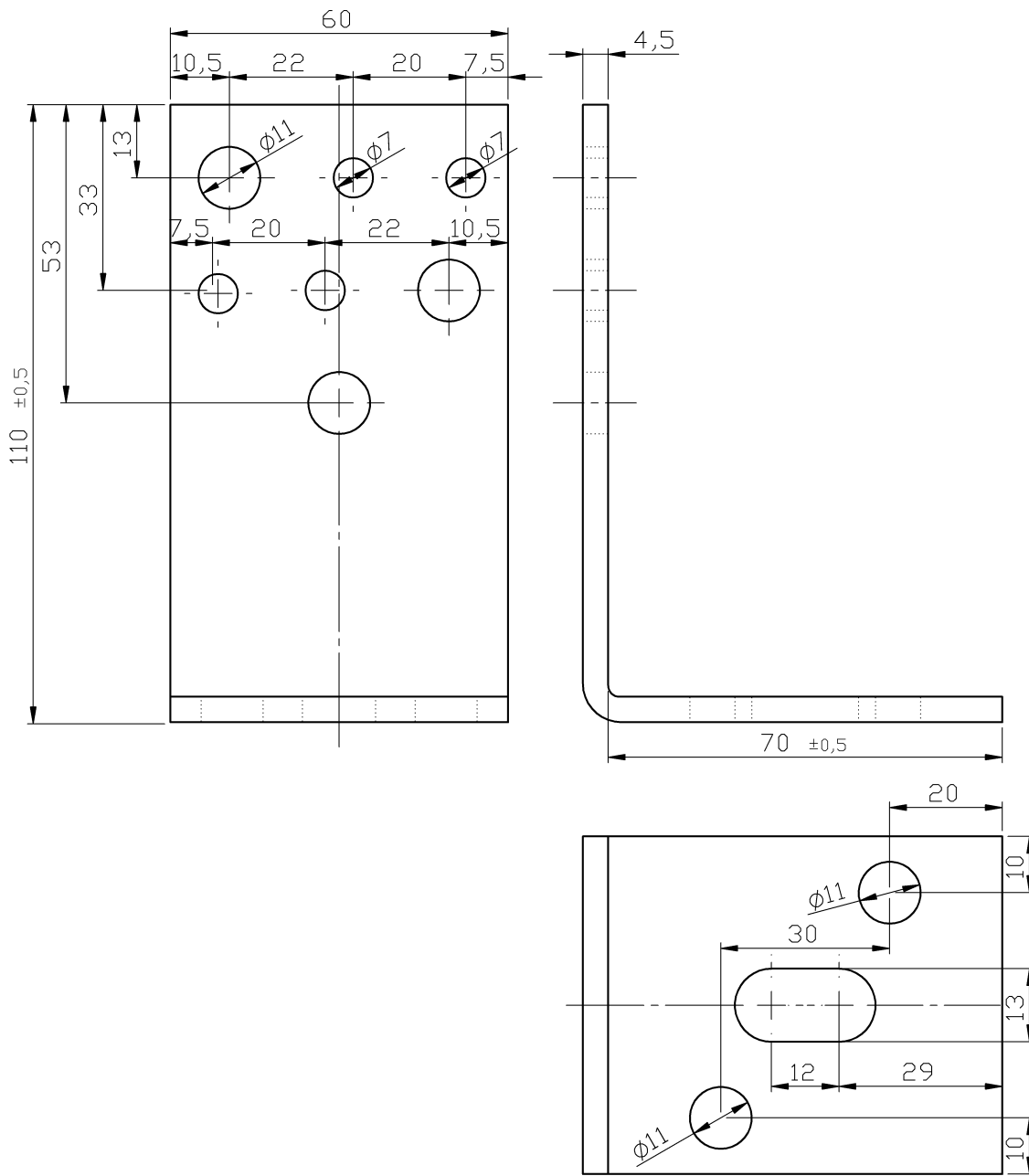


B.16 Stützenschuhe rostfrei 071286000RF+071288000RF



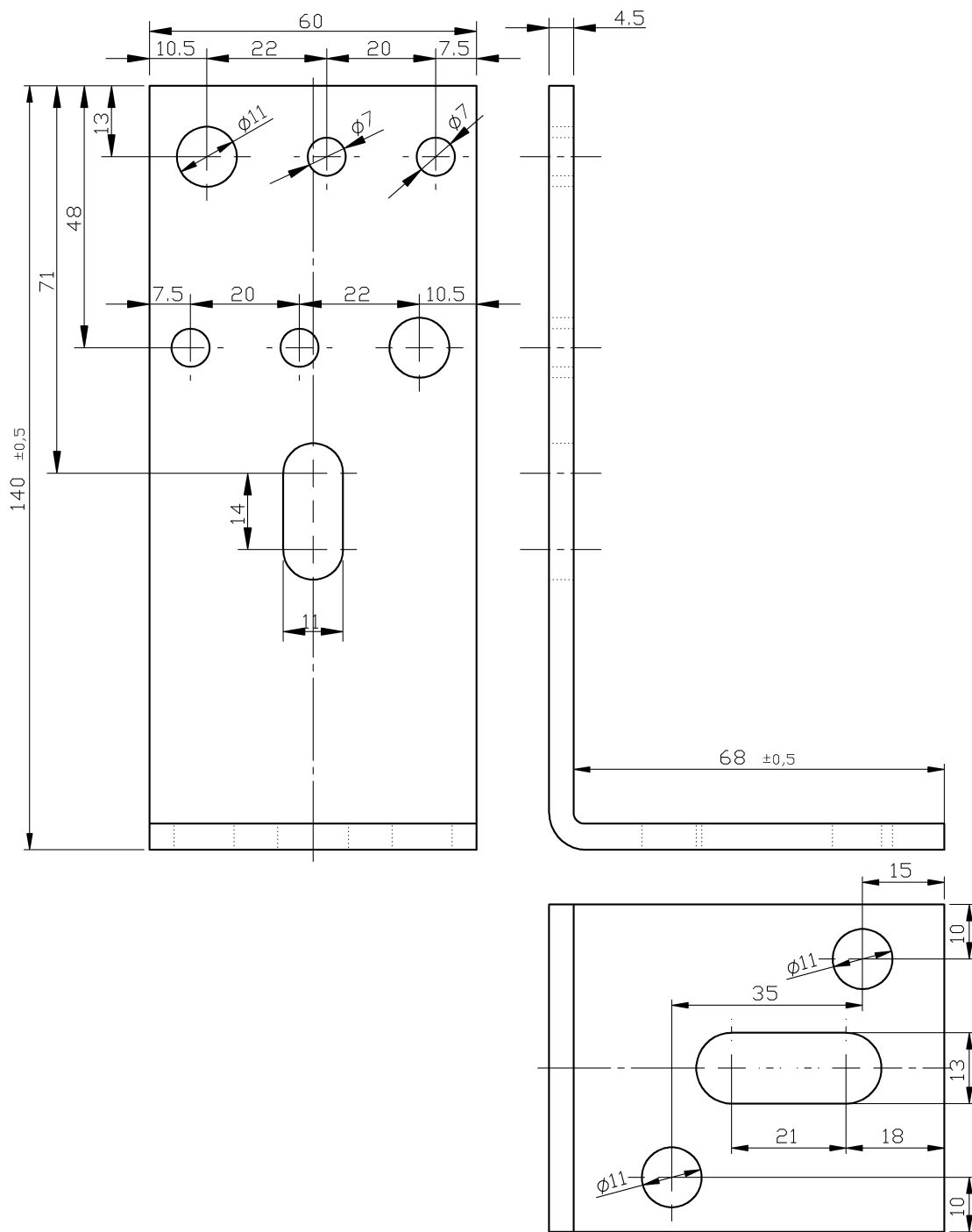
Oberfl.:elektrolytisch poliert

B.17 L-Stützenschuhe 071292000CE



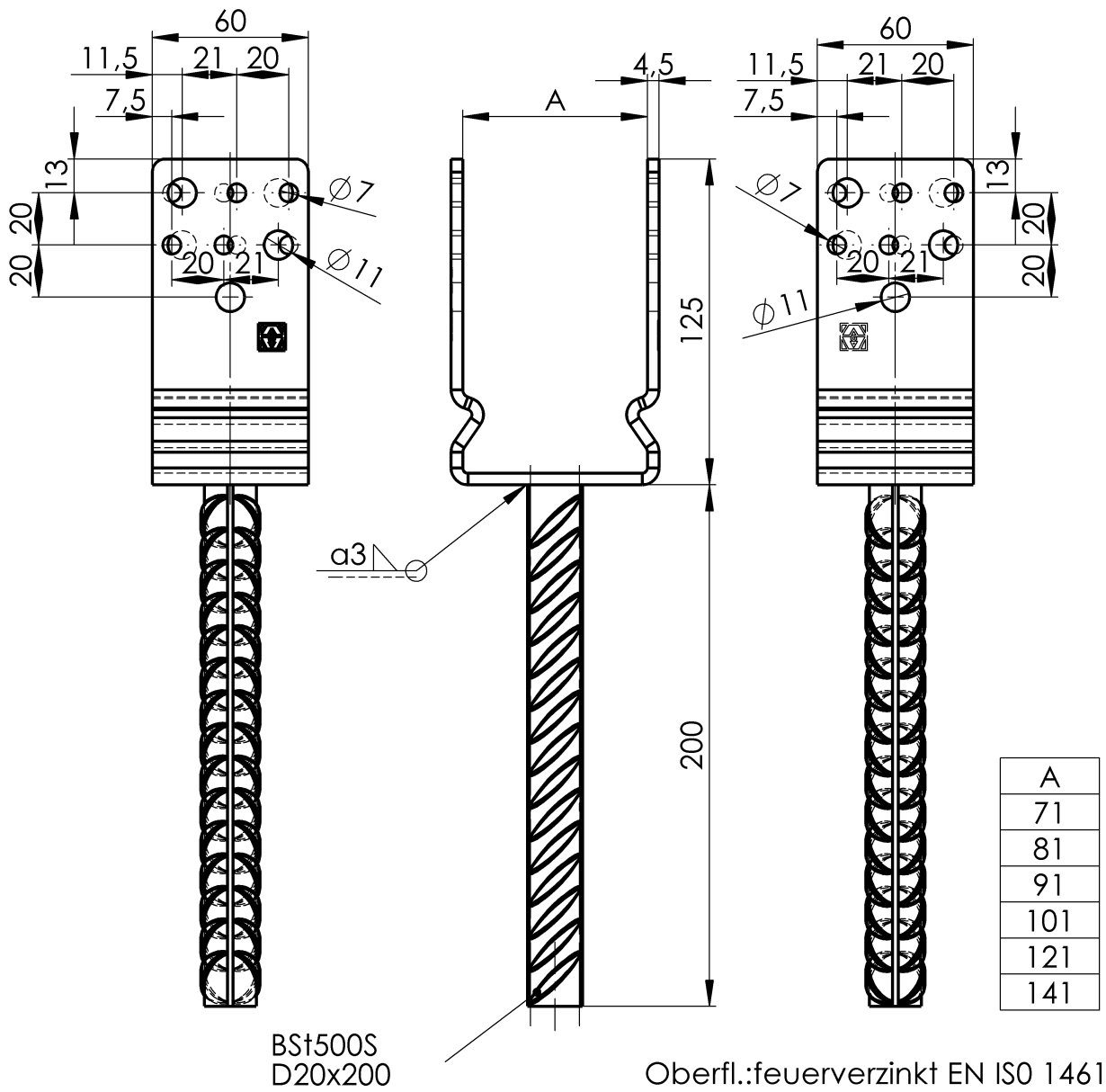
Oberfl.: feuerverzinkt EN ISO 1461

B.18 L-Stützenschuhe 071292140CE

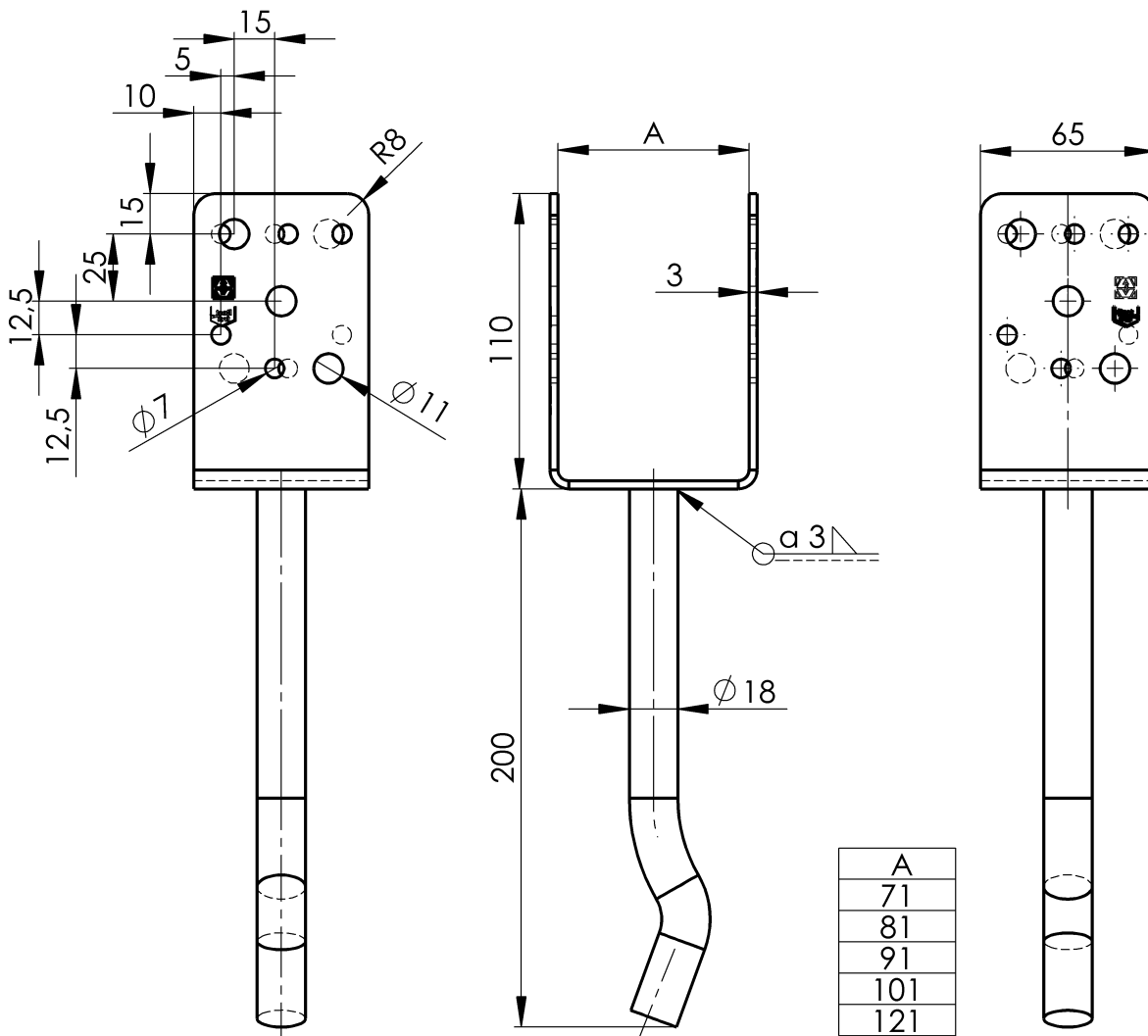


Oberfl.: feuerverzinkt EN ISO 1461

B.19 Schwere Stützenschuhe 071294000CE-071300000CE

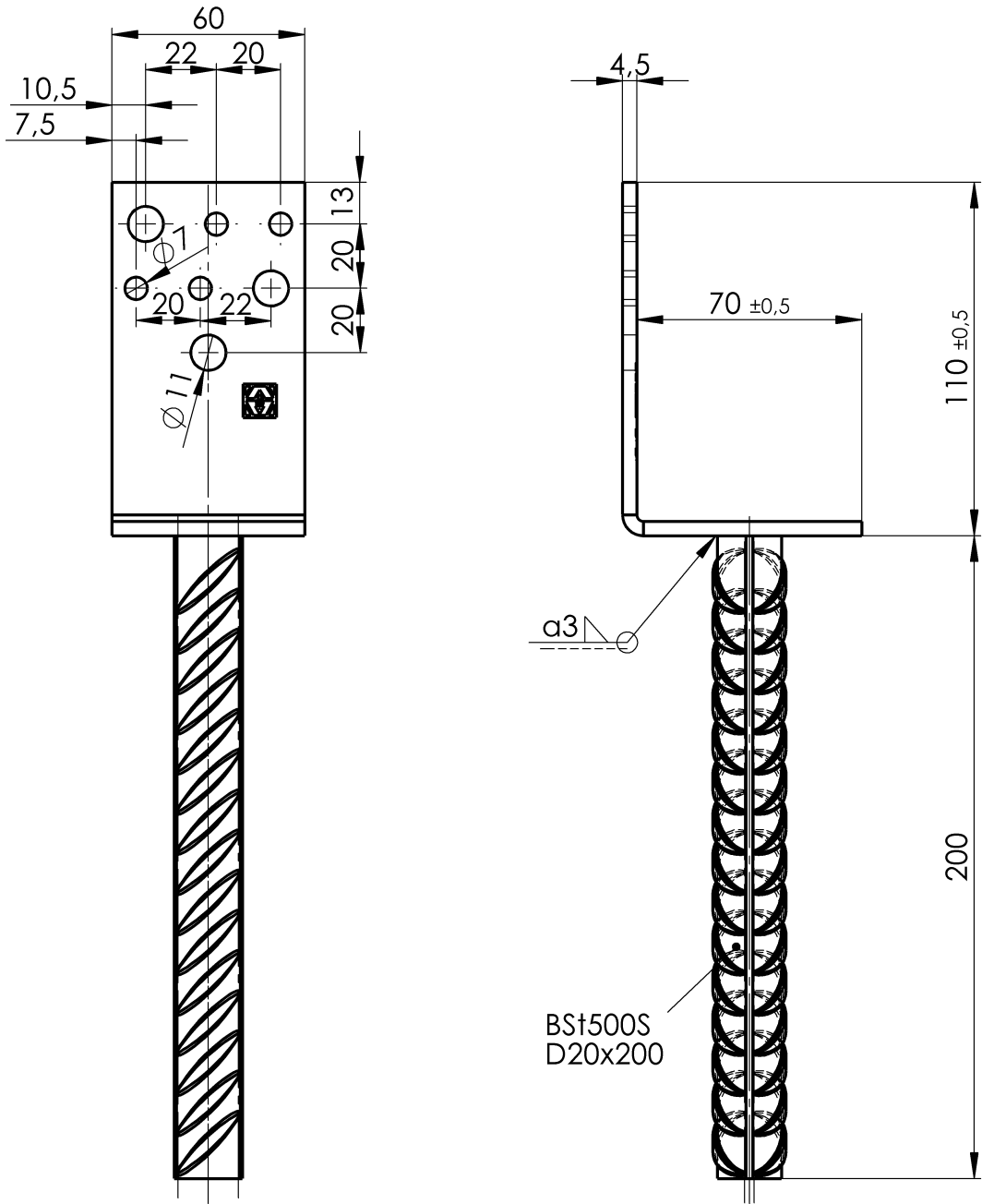


B.20 U-Stützenschuhe rostfrei 071294000RF-071298000RF



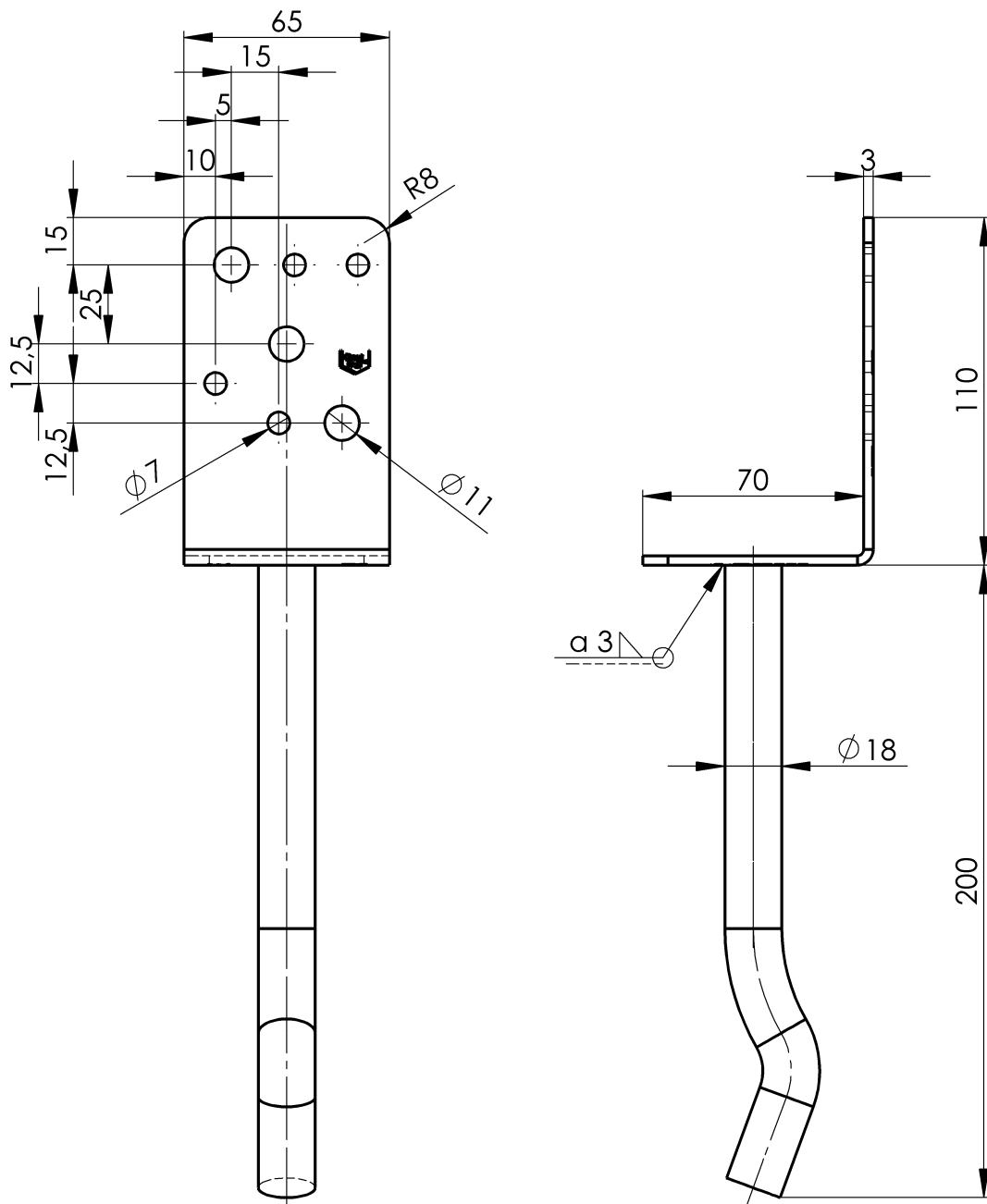
Oberfl.:elektrolytisch poliert

B.21 Schwere Stützenschuhe L-Form 071299000CE



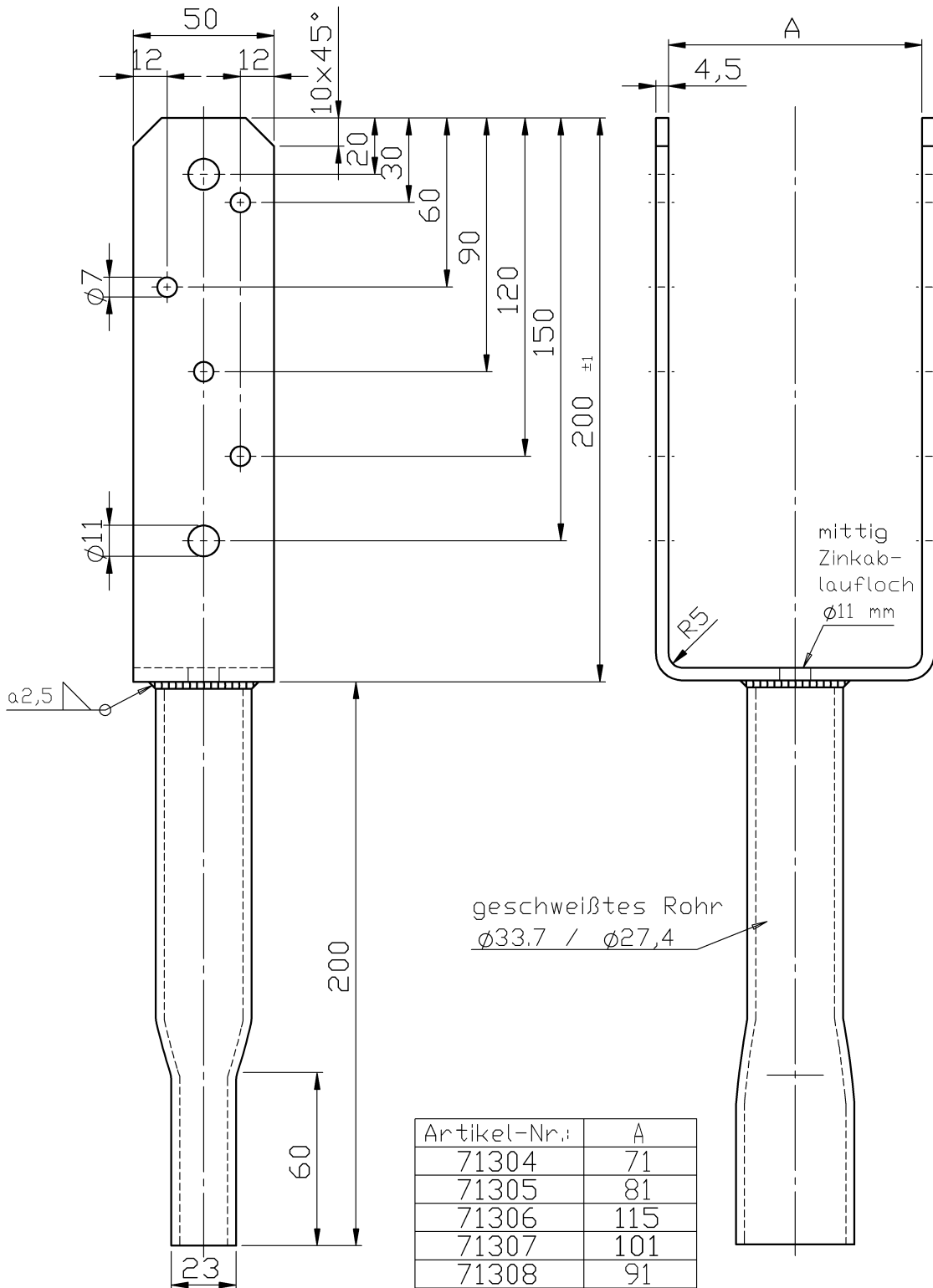
Oberfl.: feuerverzinkt EN ISO 1461

B.22 L-Stützenschuhe rostfrei 071299000RF



Oberfl.:elektrolytisch poliert

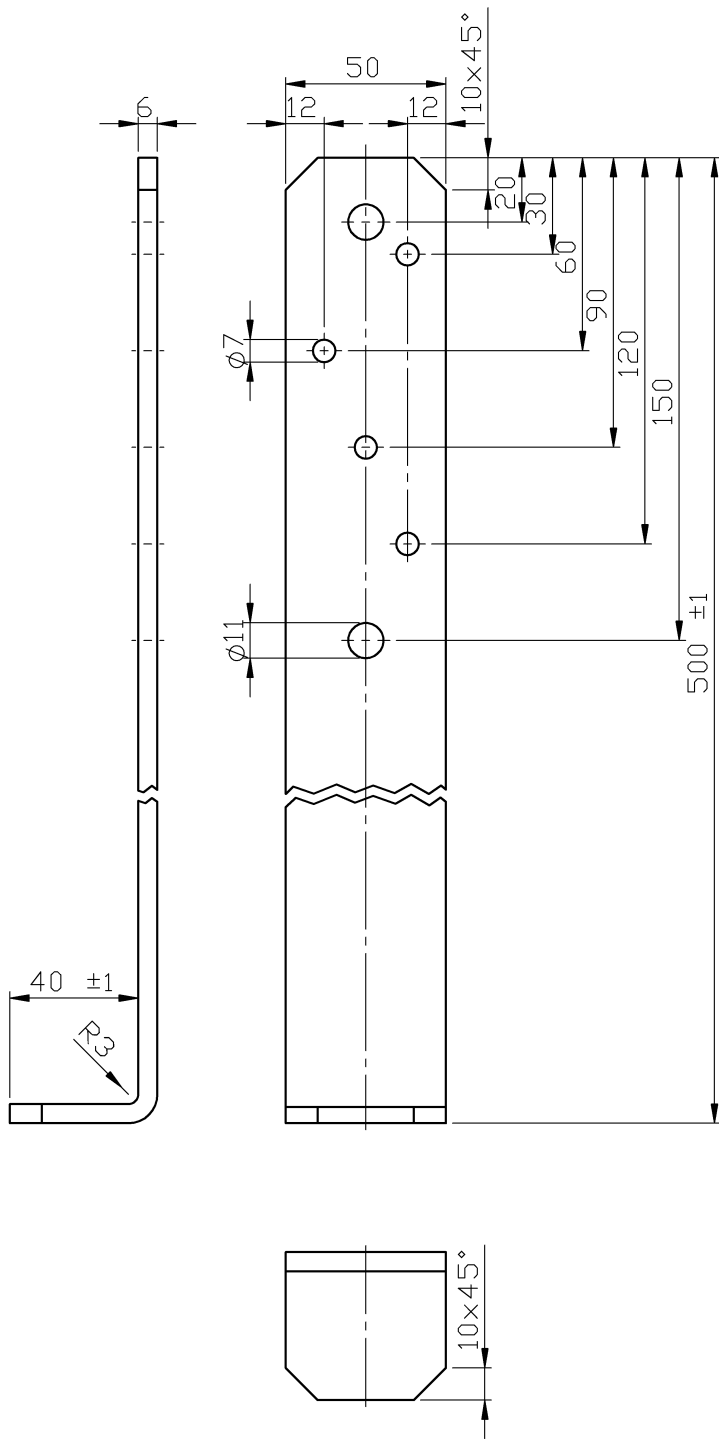
B.23 Schwere Stützenschuhe mit Rohrdolle 071304000CE-071308000CE



Oberfl.: feuerverzinkt EN ISO 1461

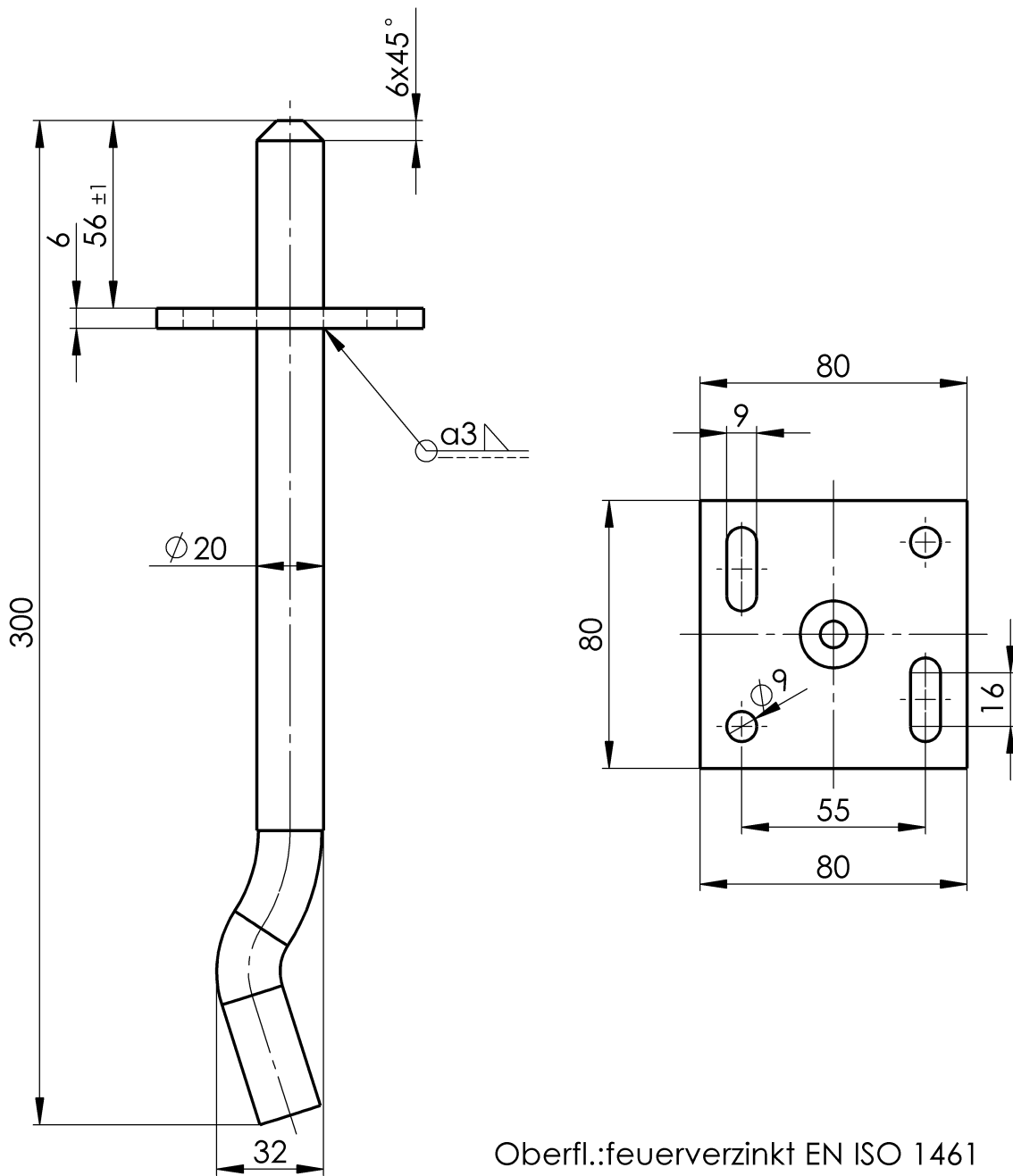


B.24 Verstellbare Schwerlastbetonanker 071310000CE

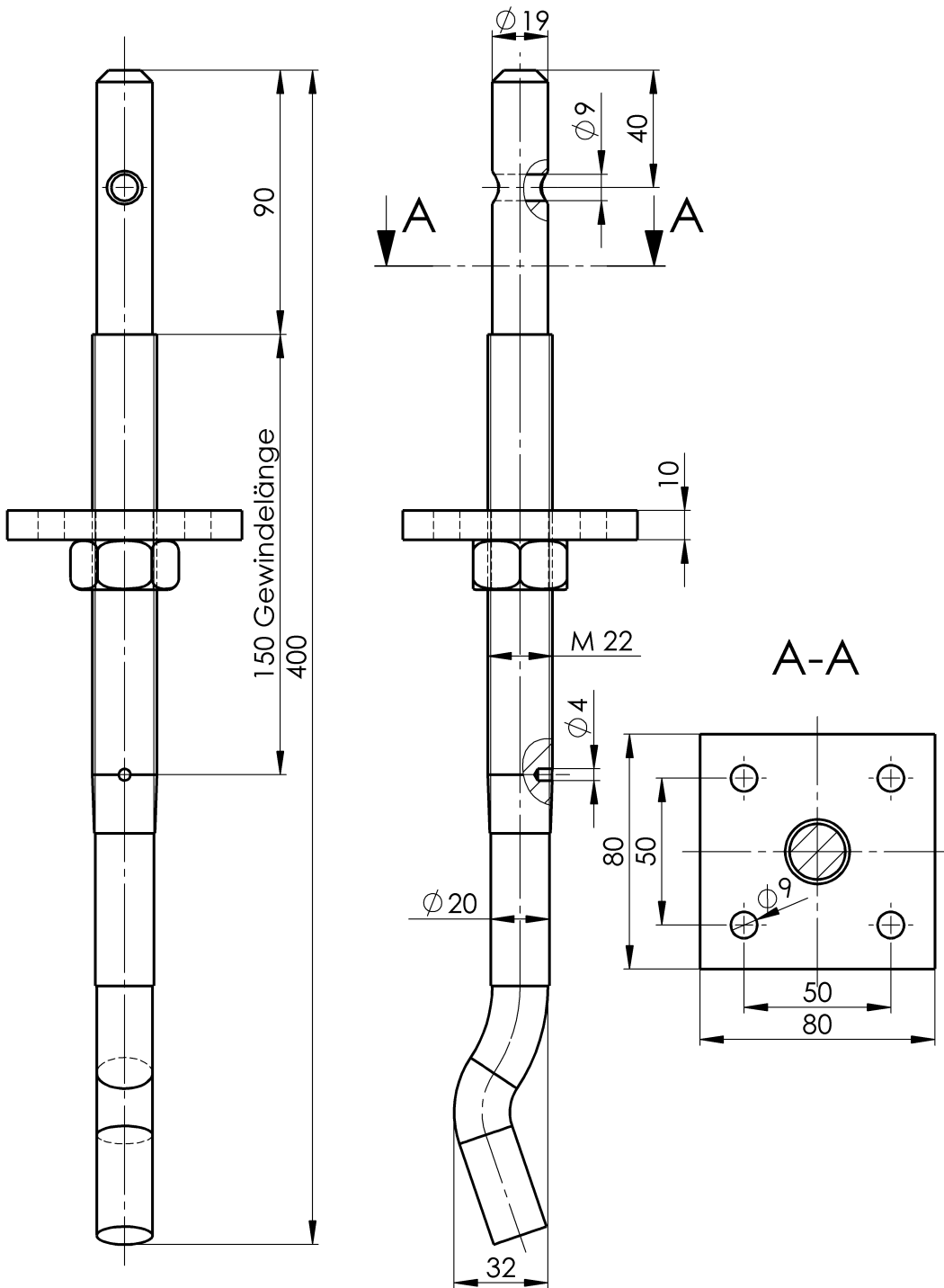


Oberfl.: feuerverzinkt EN ISO 1461

B.25 Stützenschuh mit durchgehender Dolle 071311000CE

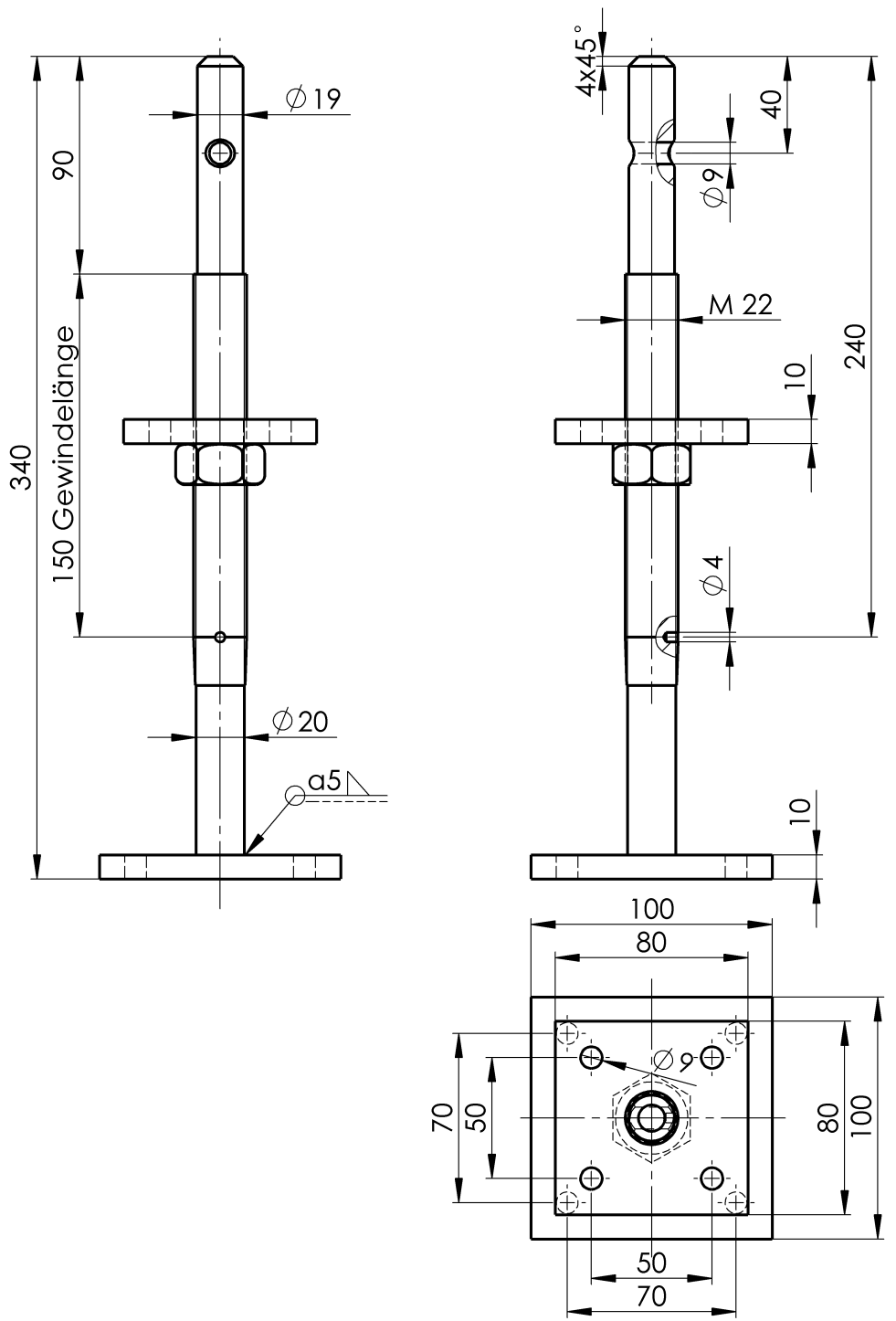


B.26 Höhenverstellbarer Stützenschuh 071312000CE



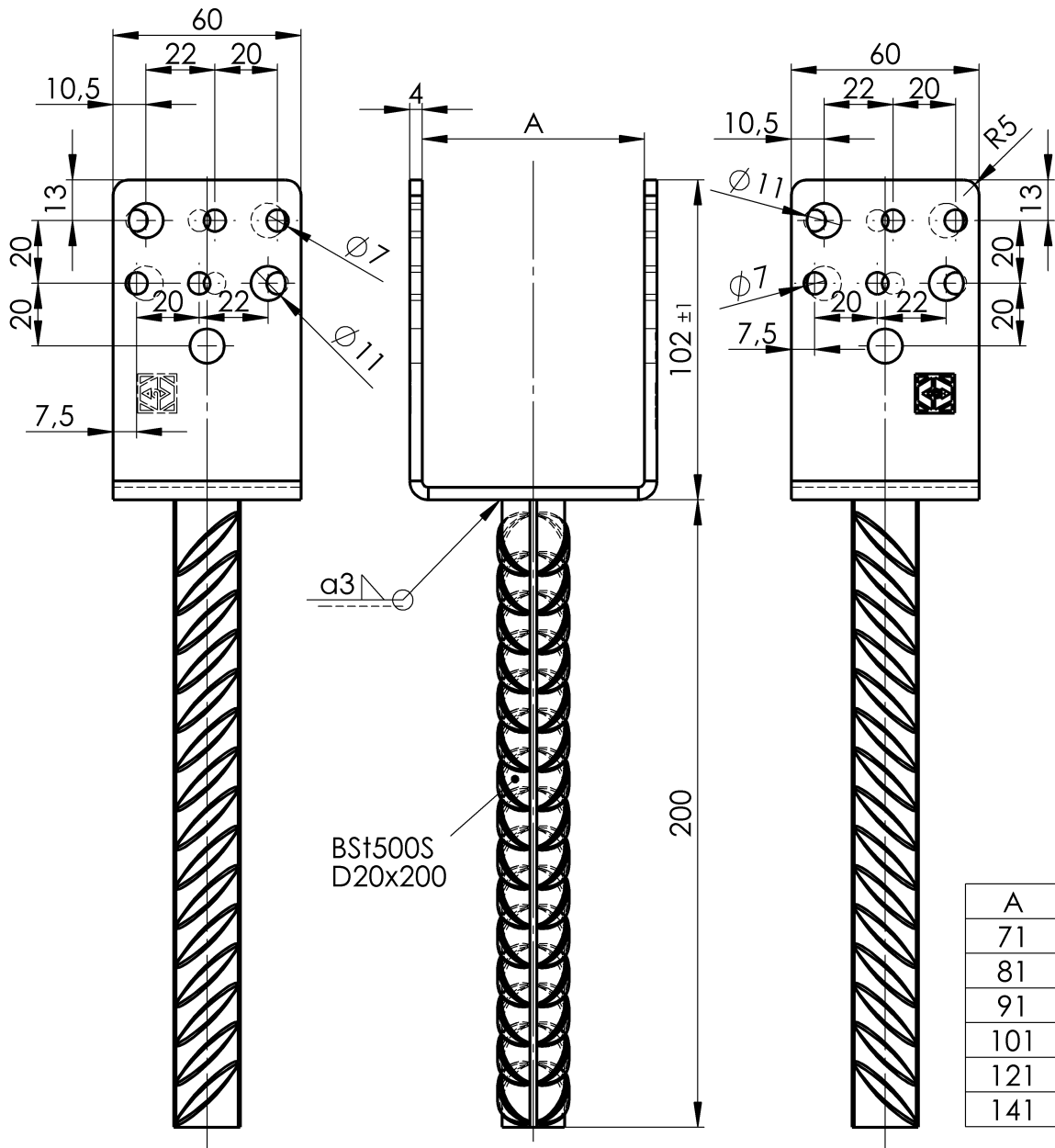
Oberfl.:galvanisch verzinkt EN ISO 2081

B.27 Höhenverstellbarer Stützenschuh 071313000CE



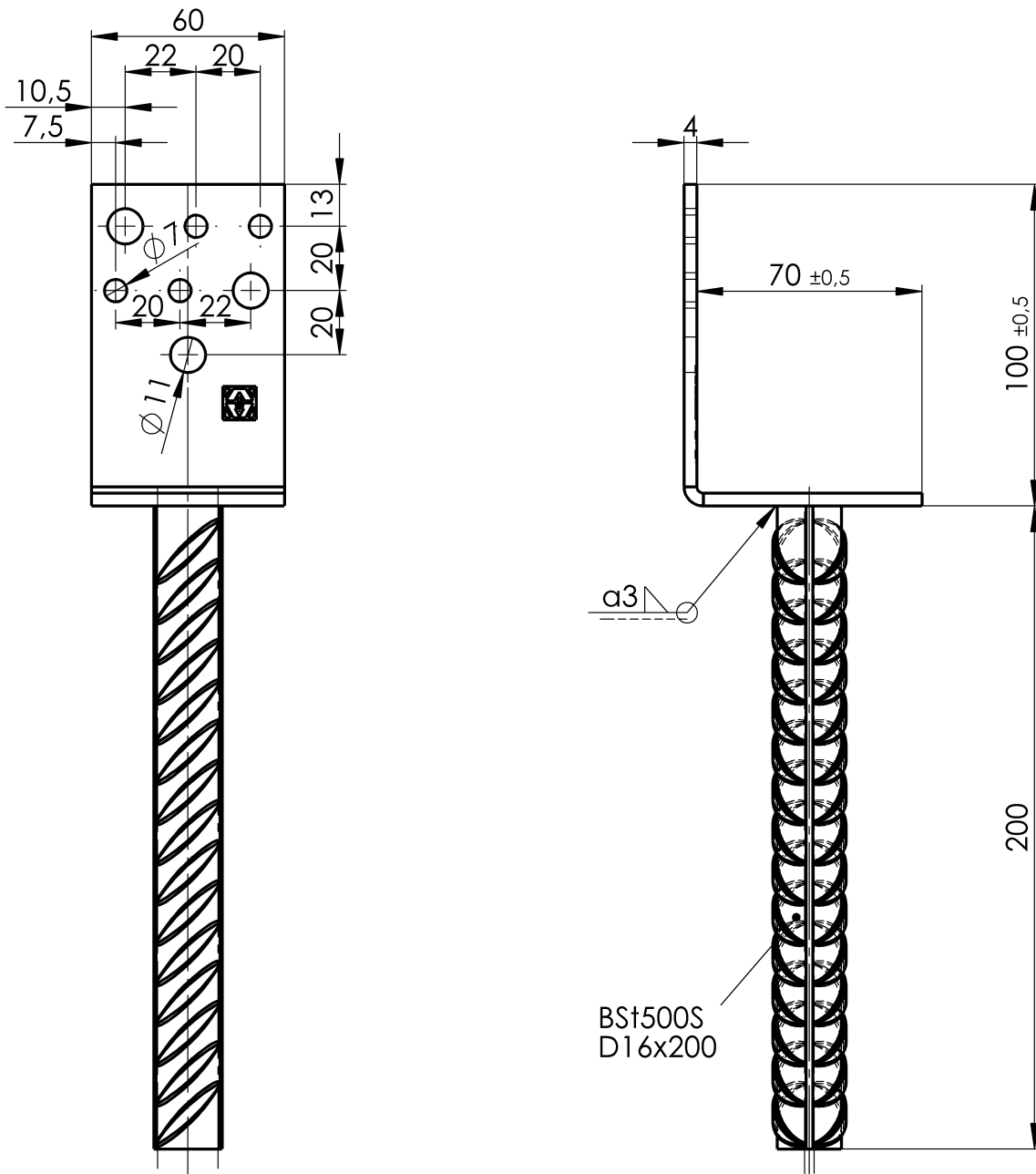
Oberfl.:galvanisch verzinkt EN ISO 2081

B.28 Leichte Stützenschuhe Typ B 071314000CE-071320000CE



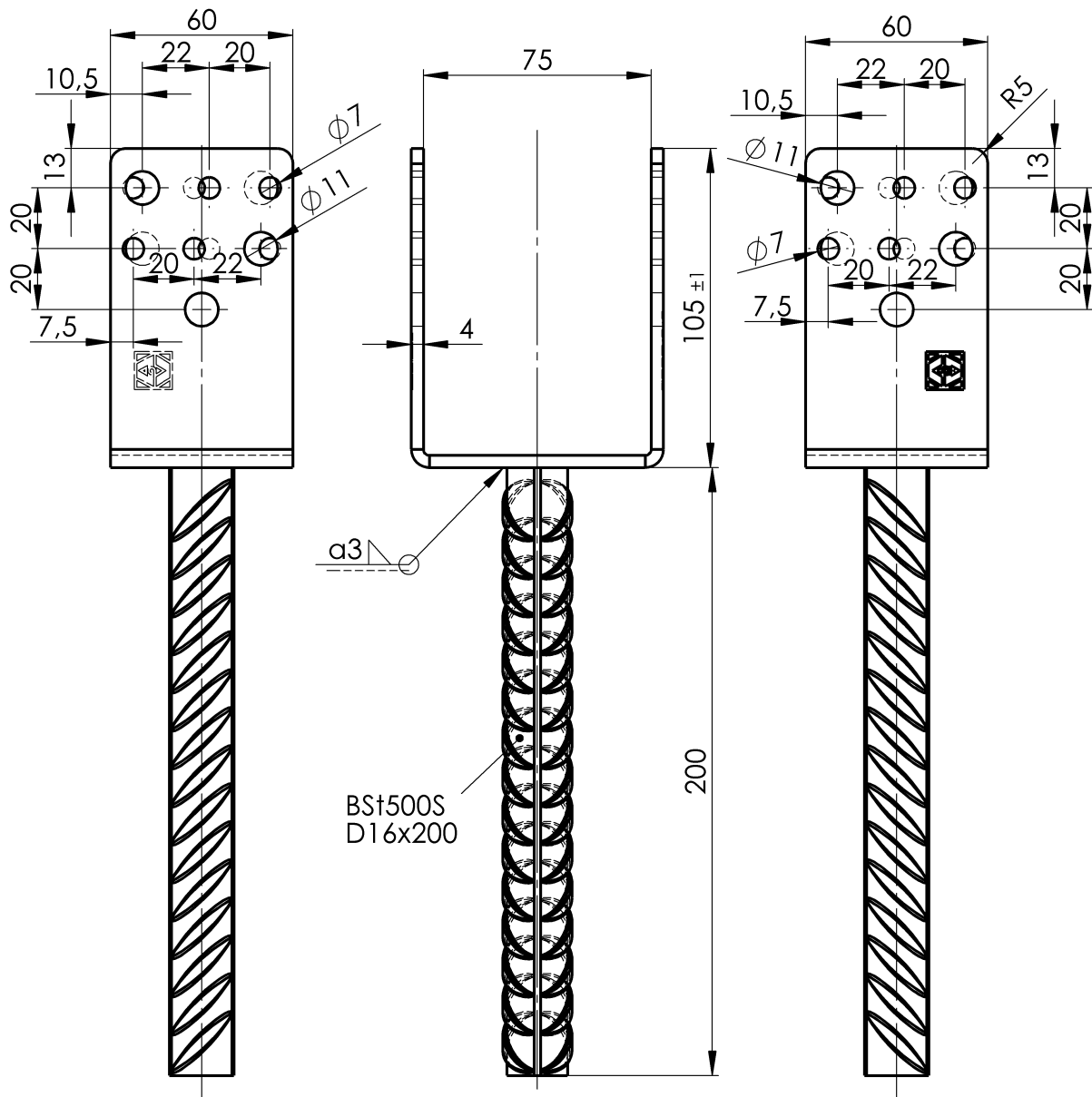
Oberfl.: feuerverzinkt EN ISO 1461

B.29 Leichte Stützenschuhe Typ B, L-Form 071319000CE



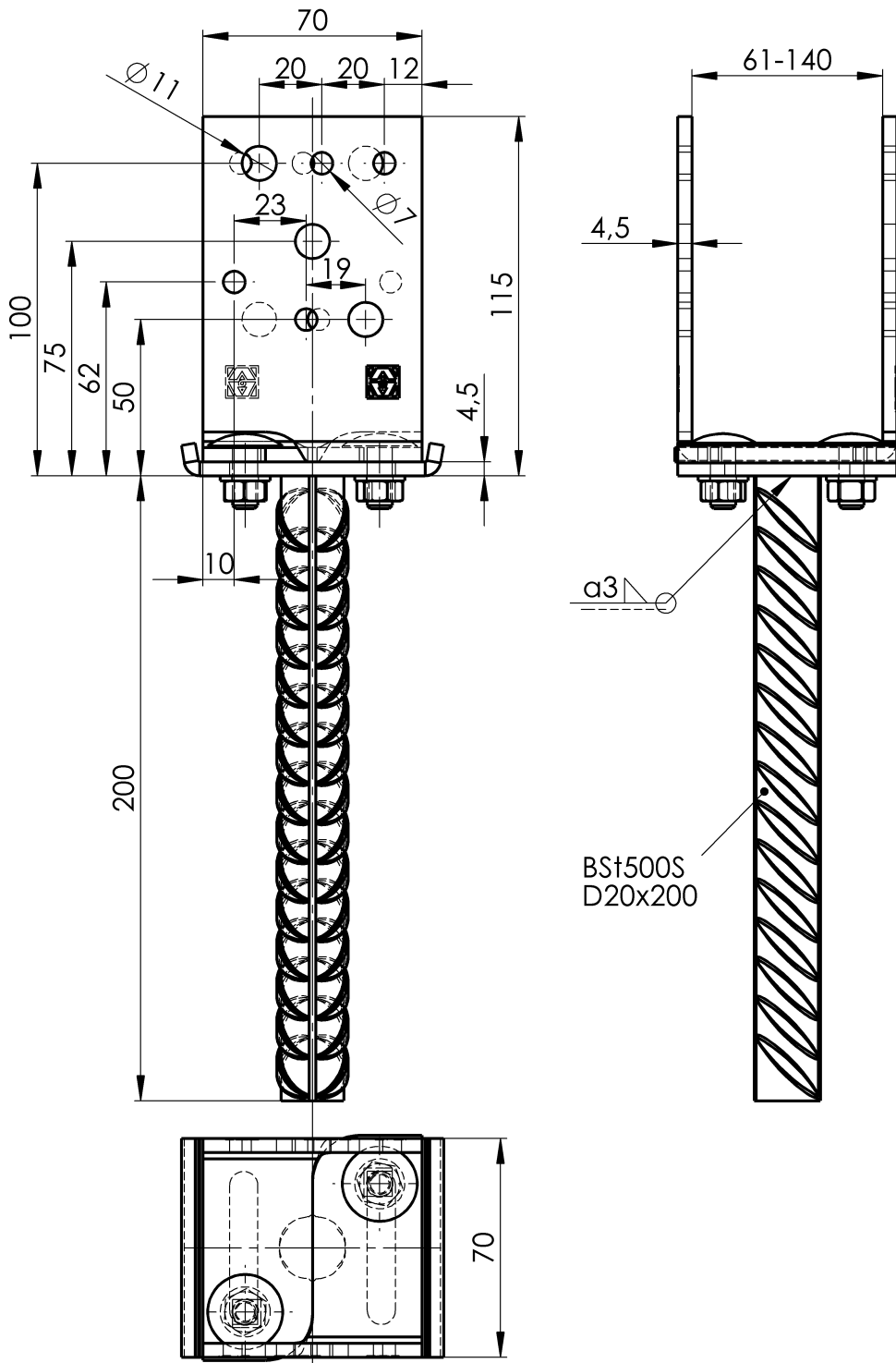
Oberfl.: feuerverzinkt EN ISO 1461

B.30 Leichte Stützenschuhe Typ B 071323000CE



Oberfl.: feuerverzinkt EN ISO 1461

B.31 Leichte Stützenschuhe Typ B 071325000CE

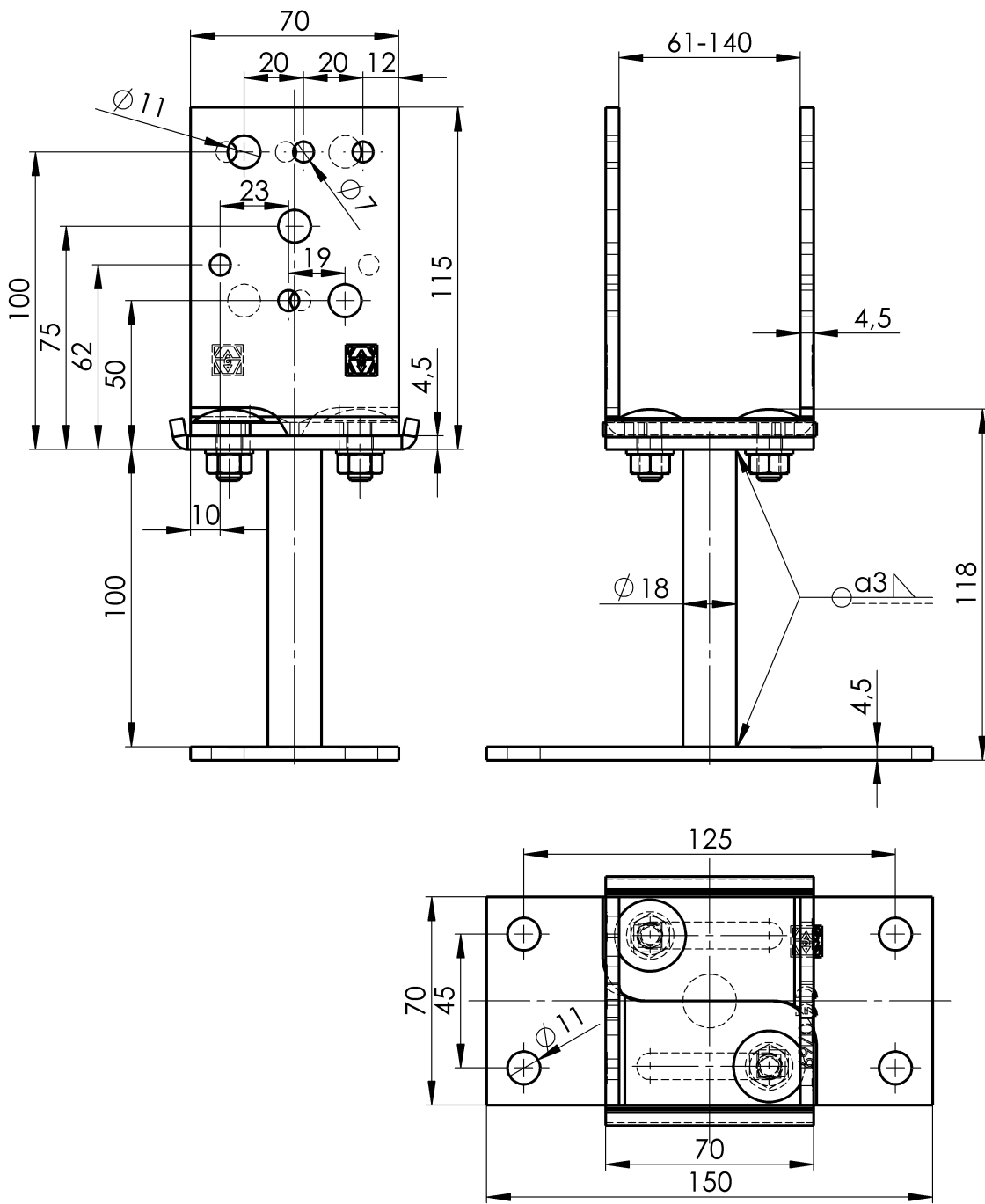


BS1500S  
D20x200

Oberfl.:galvanisch verzinkt EN ISO 2081

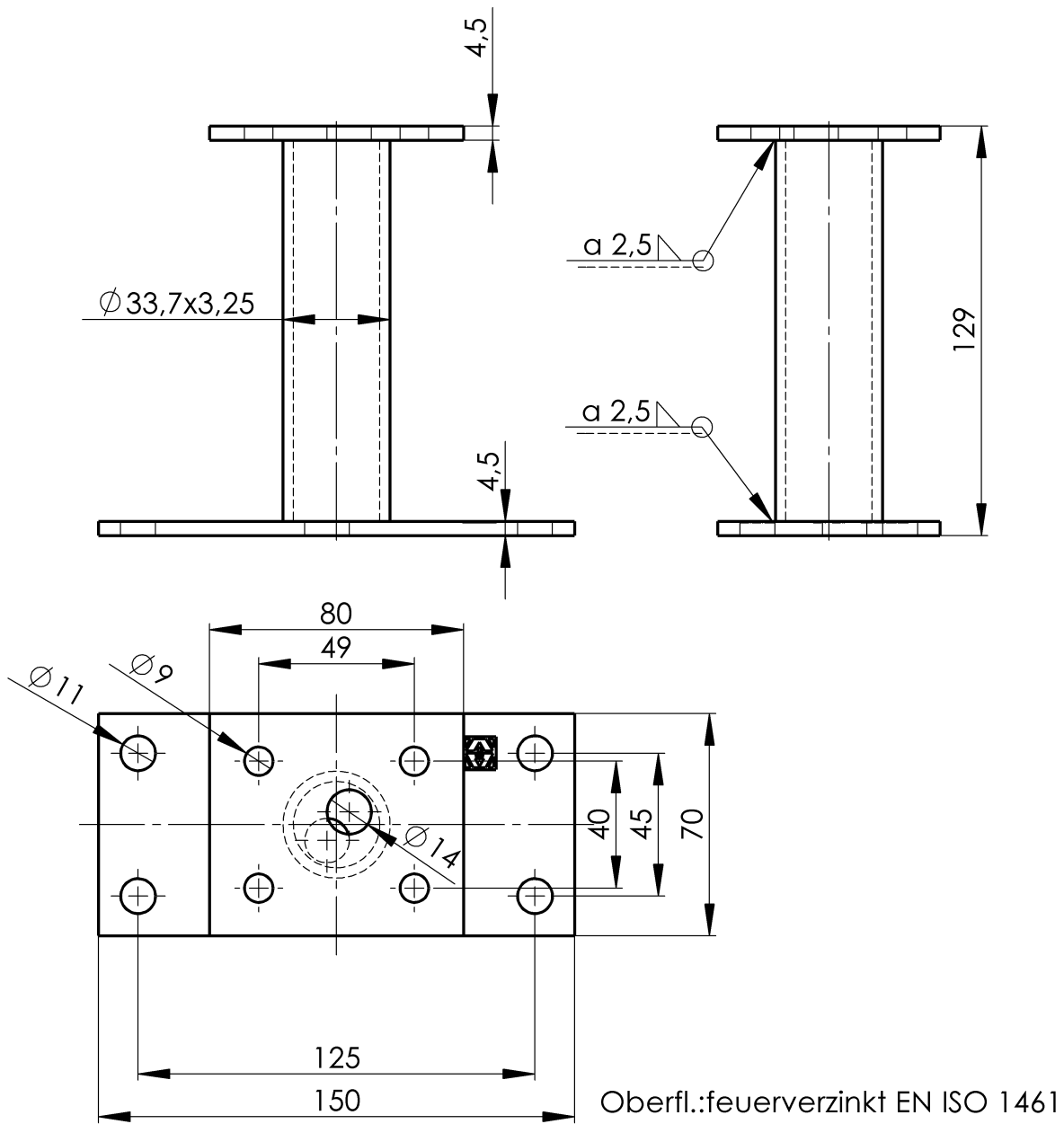


B.32 Seitenverstellbare Stützschiuhe 071326000CE

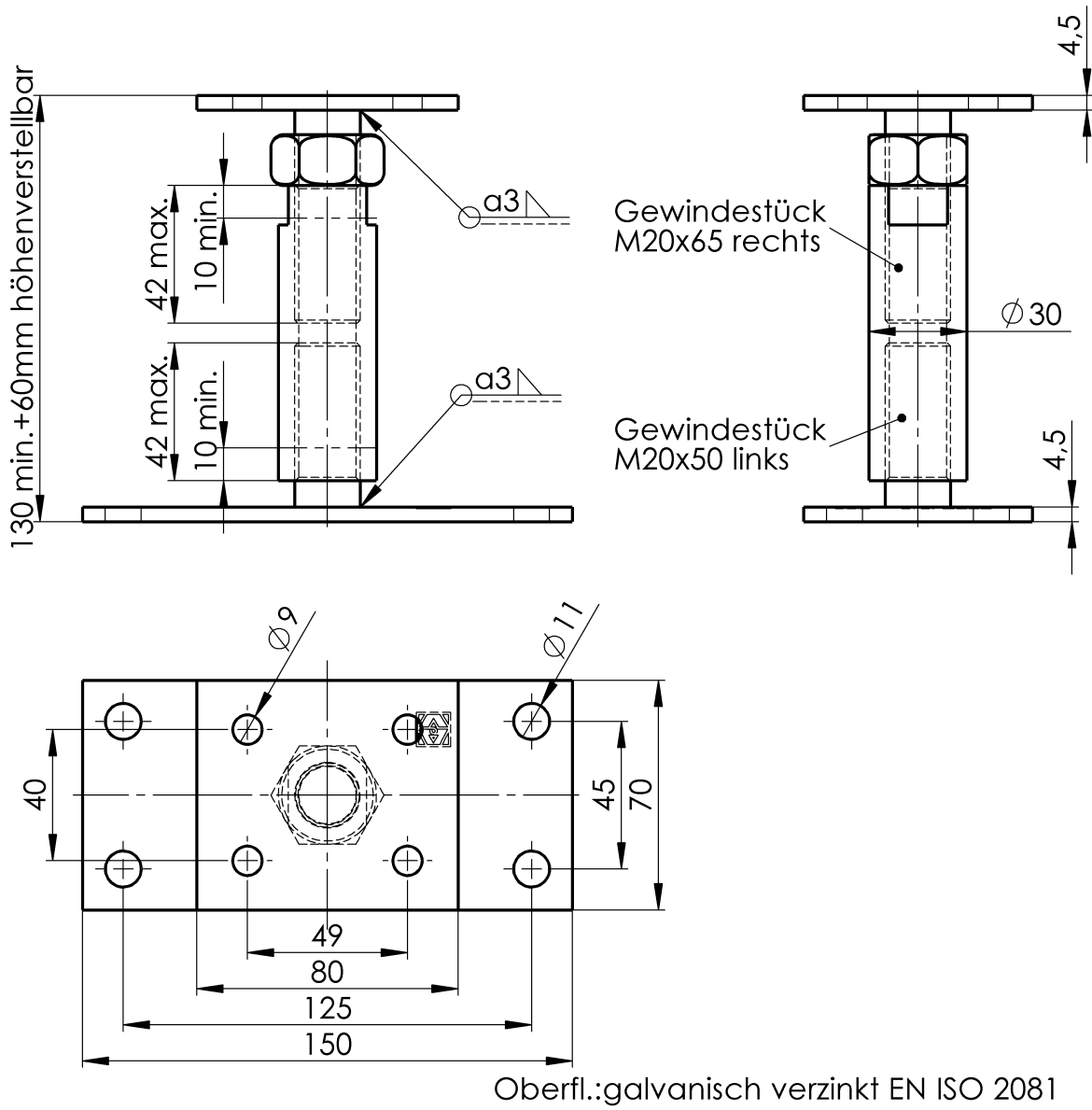


Oberfl.:galvanisch verzinkt EN ISO 2081

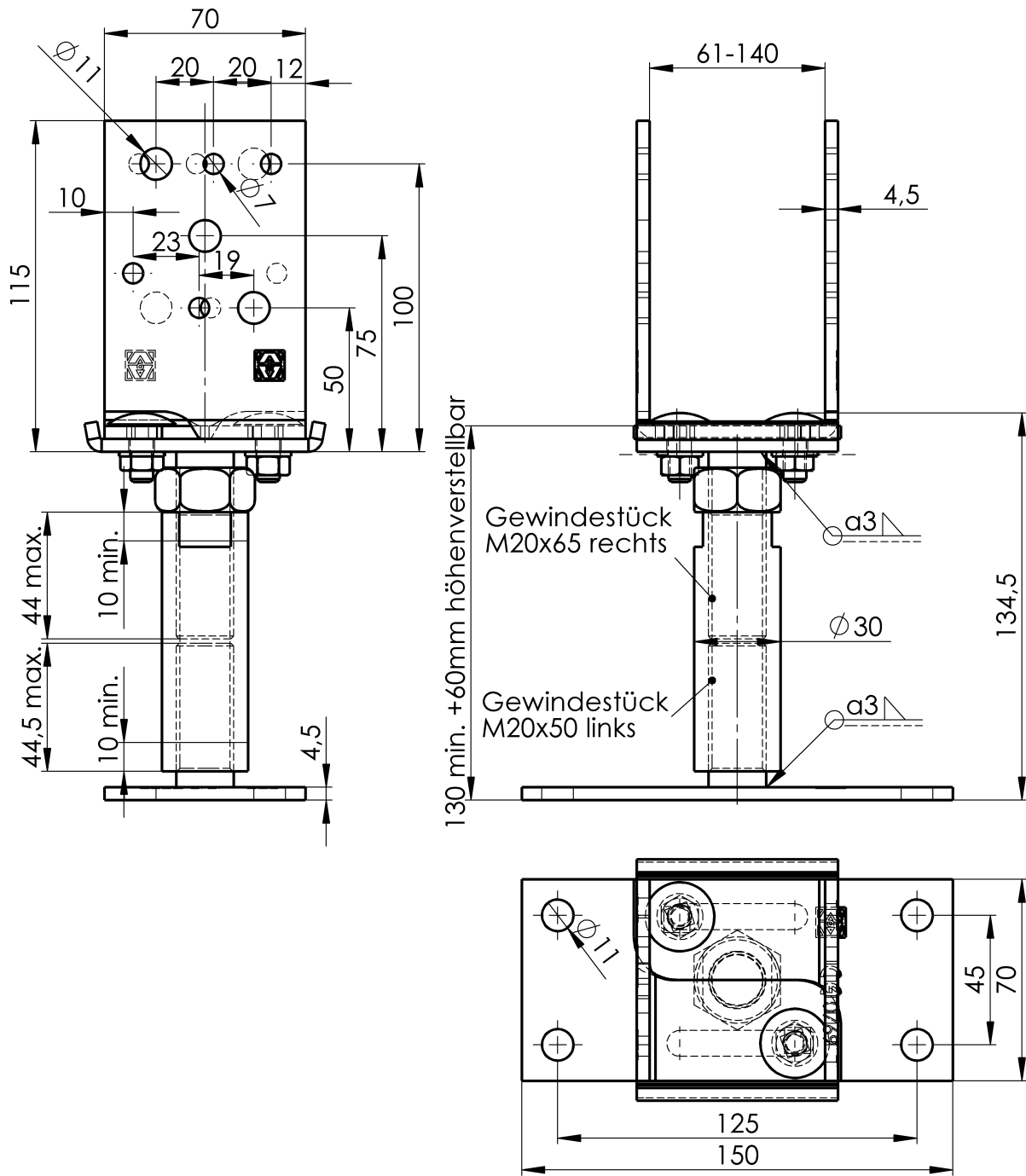
B.33 Schwerer Stützenschuh mit Rohrdolle 071328000CE



B.34 Höhenverstellbare Stützenschuhe 071329000CE



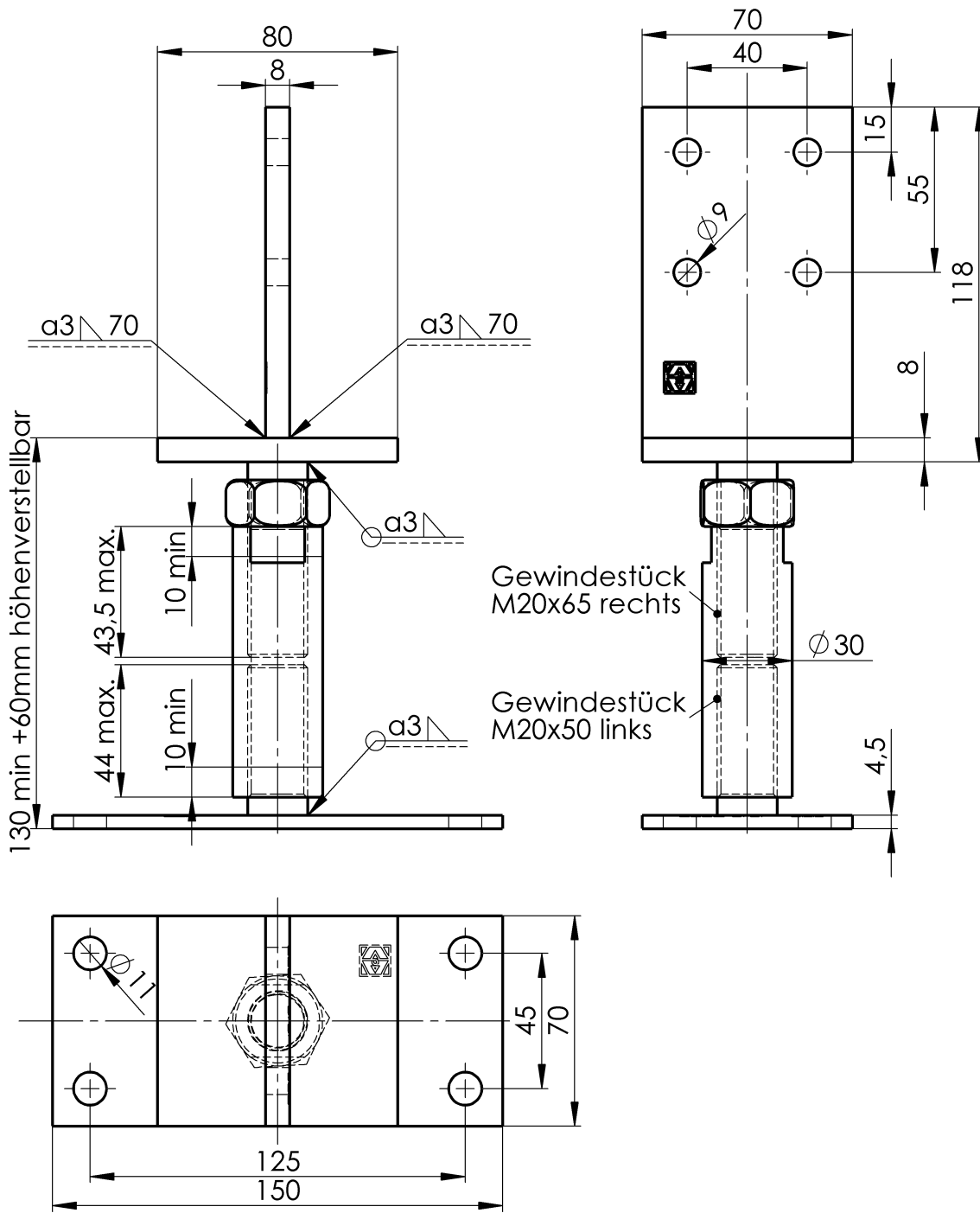
B.35 Seiten- und Höhenverstellbare Stützenschuhe 071331000CE



Oberfl.: galvanisch verzinkt EN ISO 2081

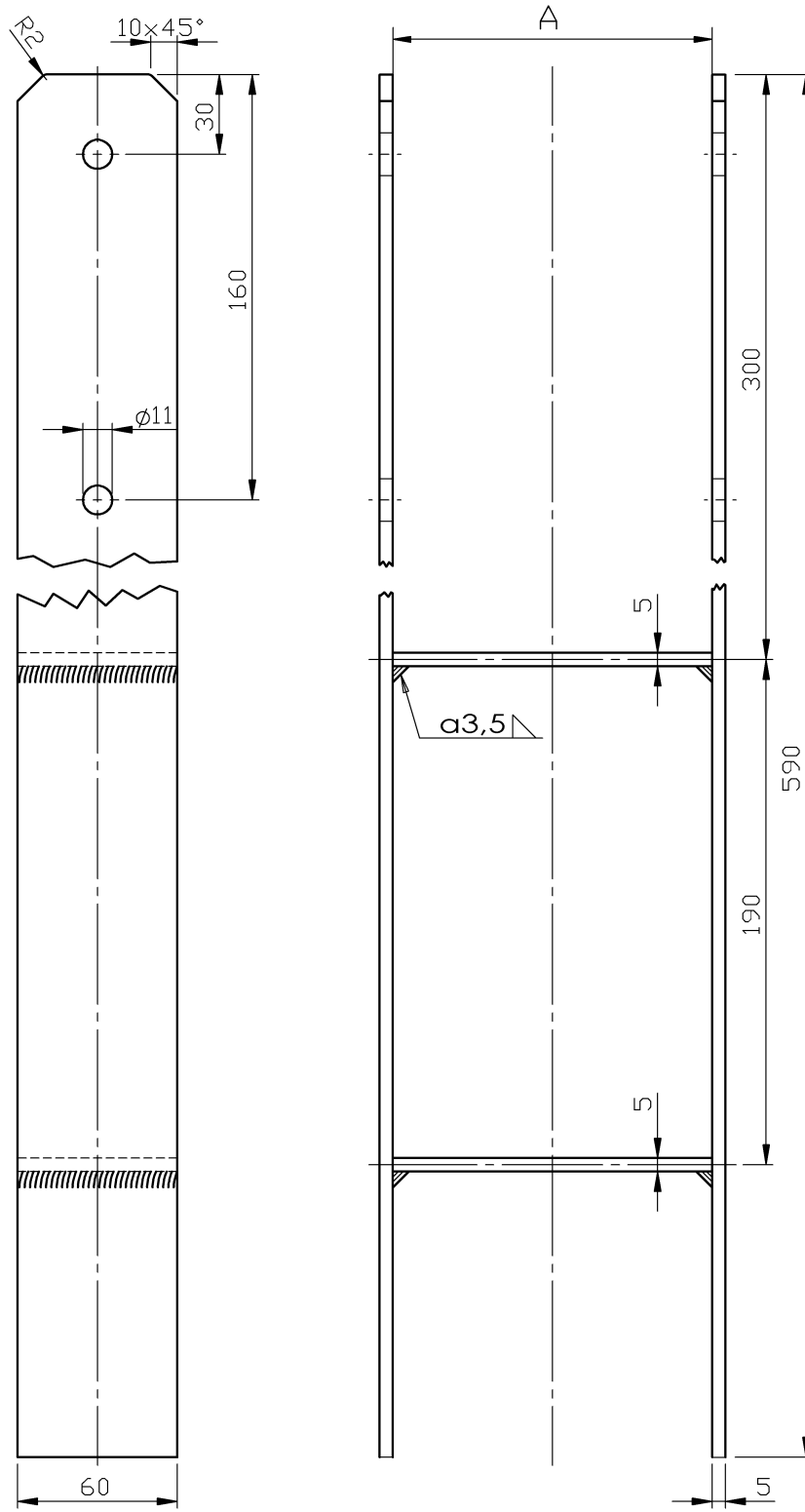


B.37 Höhenverstellbare Stützenschuhe mit Steg 071333000CE



Oberfl.:galvanisch verzinkt EN ISO 2081

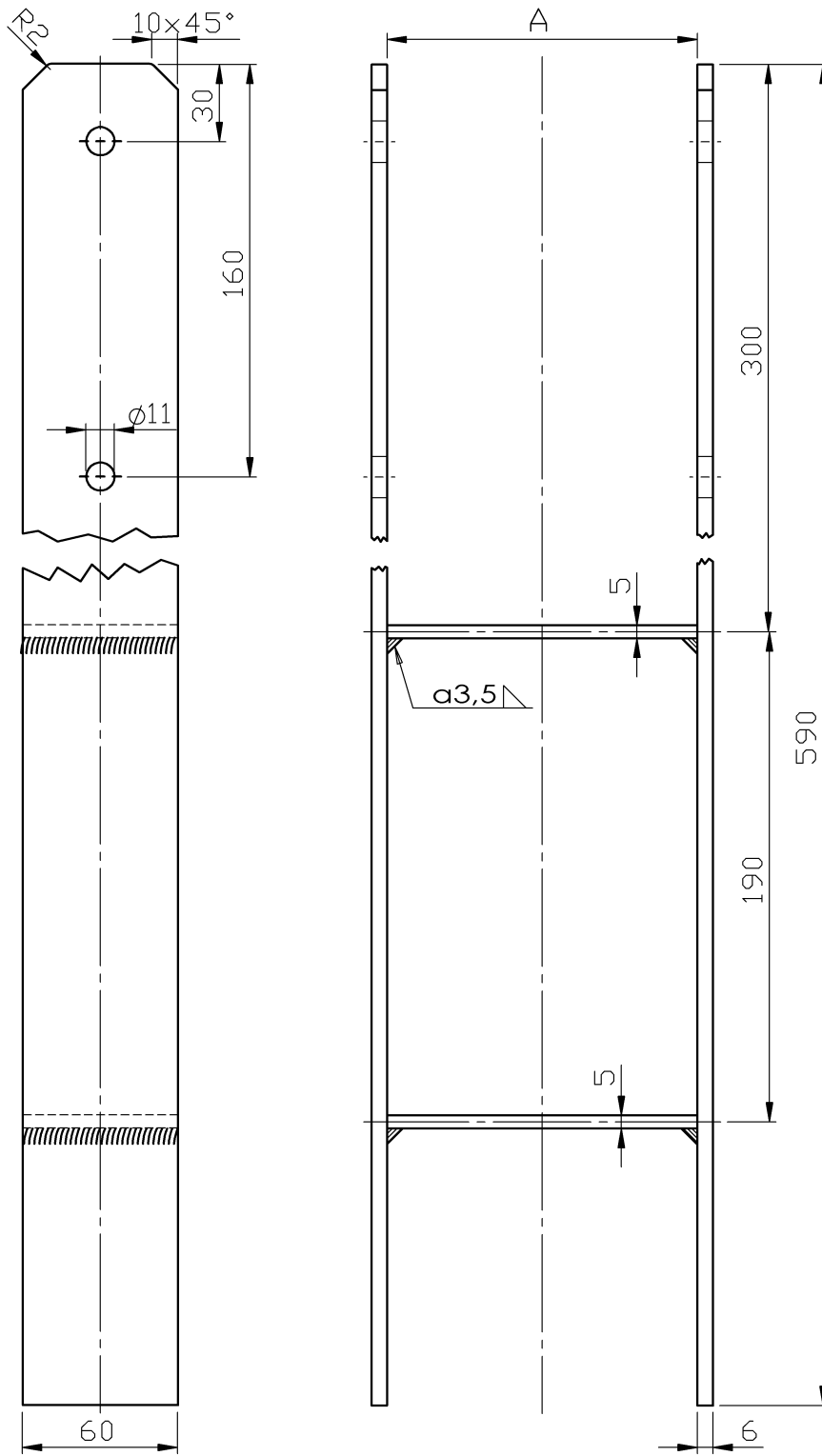
B.38 Schwere Pfostenanker H-Form 071335000CE, 071337000CE, 071338000CE, 071339000CE, 071340000CE, 071342000CE



Maß A
71
91
101
121
116
141

Oberfl.: feuerverzinkt EN ISO 1461

B.39 Schwere Pfostenanker H-Form 071335006CE, 071337006CE, 071338006CE, 071339006CE, 071340006CE, 071342006CE

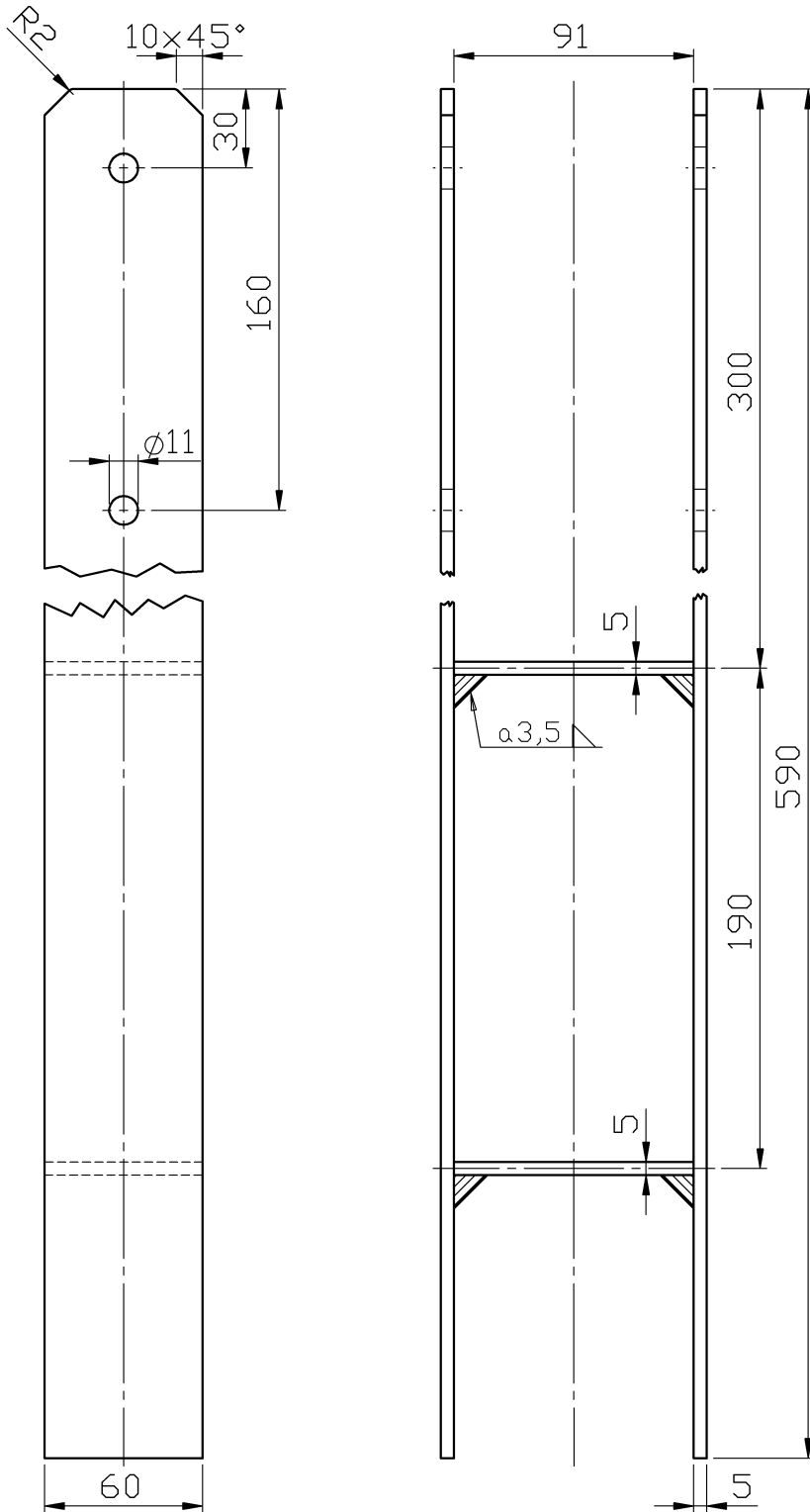


Maß A
71
91
101
121
116
141

Oberfl.: feuerverzinkt EN ISO 1461

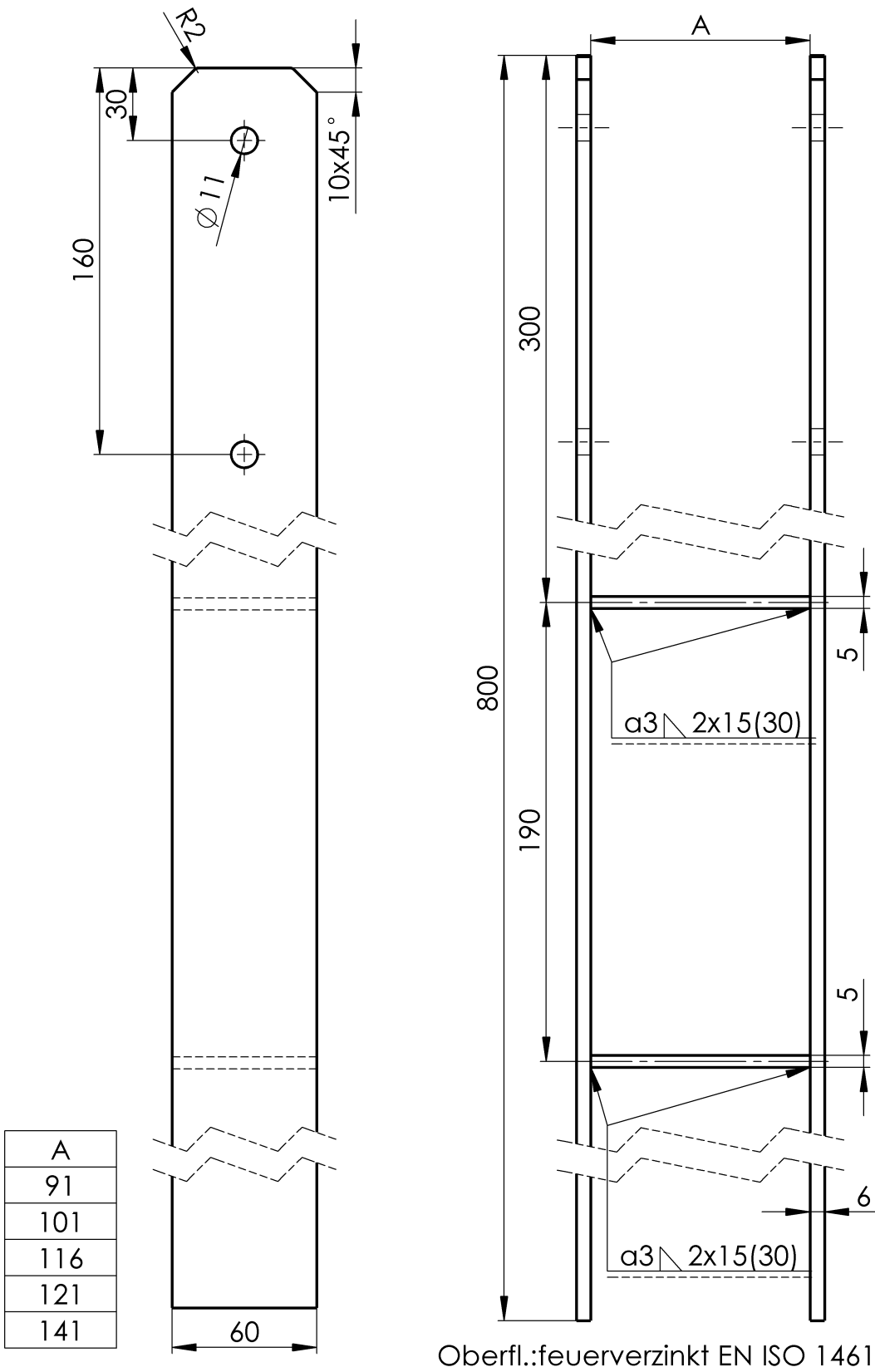


B.40 Schwere Pfostenanker H-Form, rostfrei 071337000RF



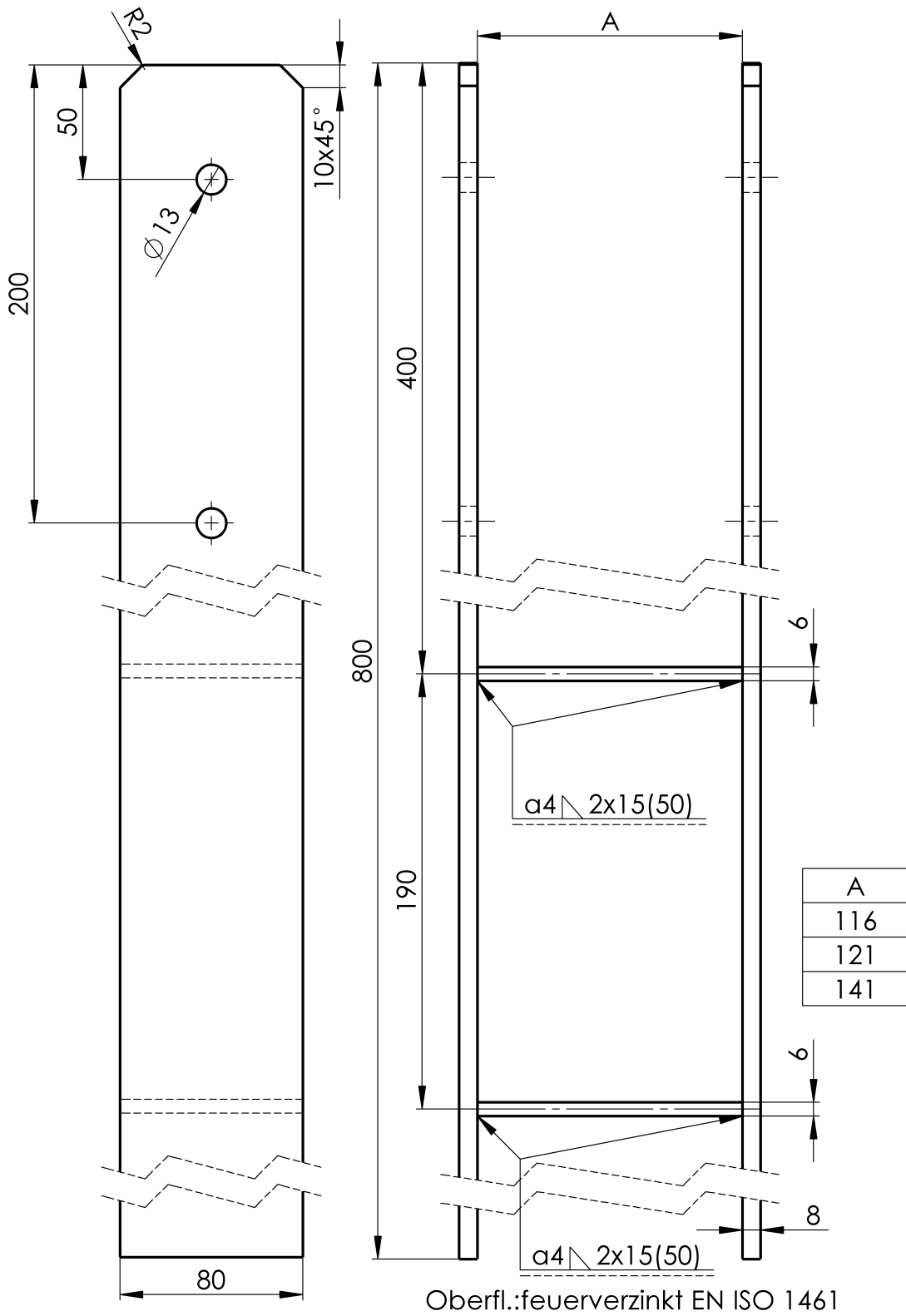
Oberfl.:elektrolytisch poliert

B.41 Schwere Pfostenanker H-Form 071337806CE-071342806CE

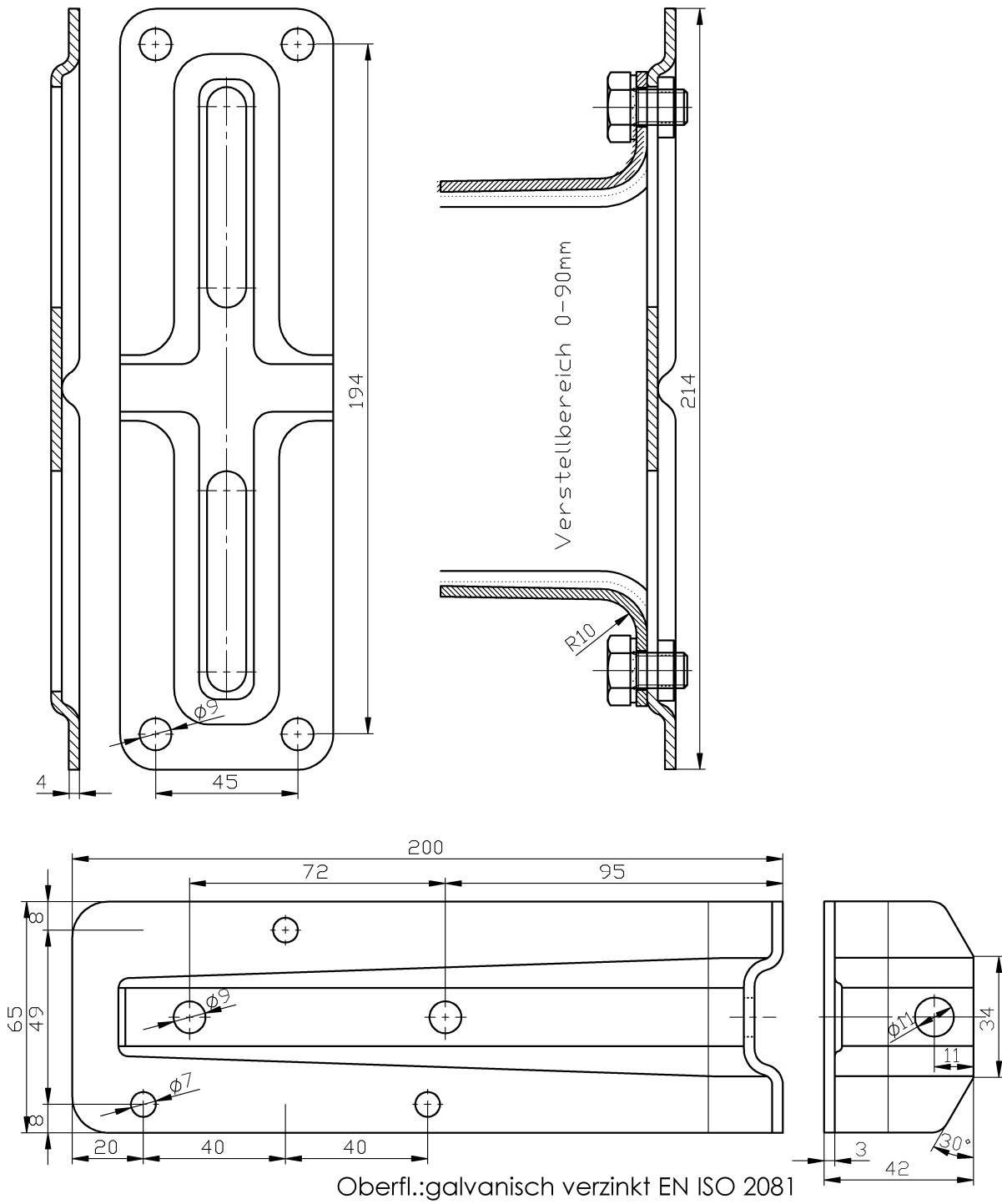


Oberfl.: feuerverzinkt EN ISO 1461

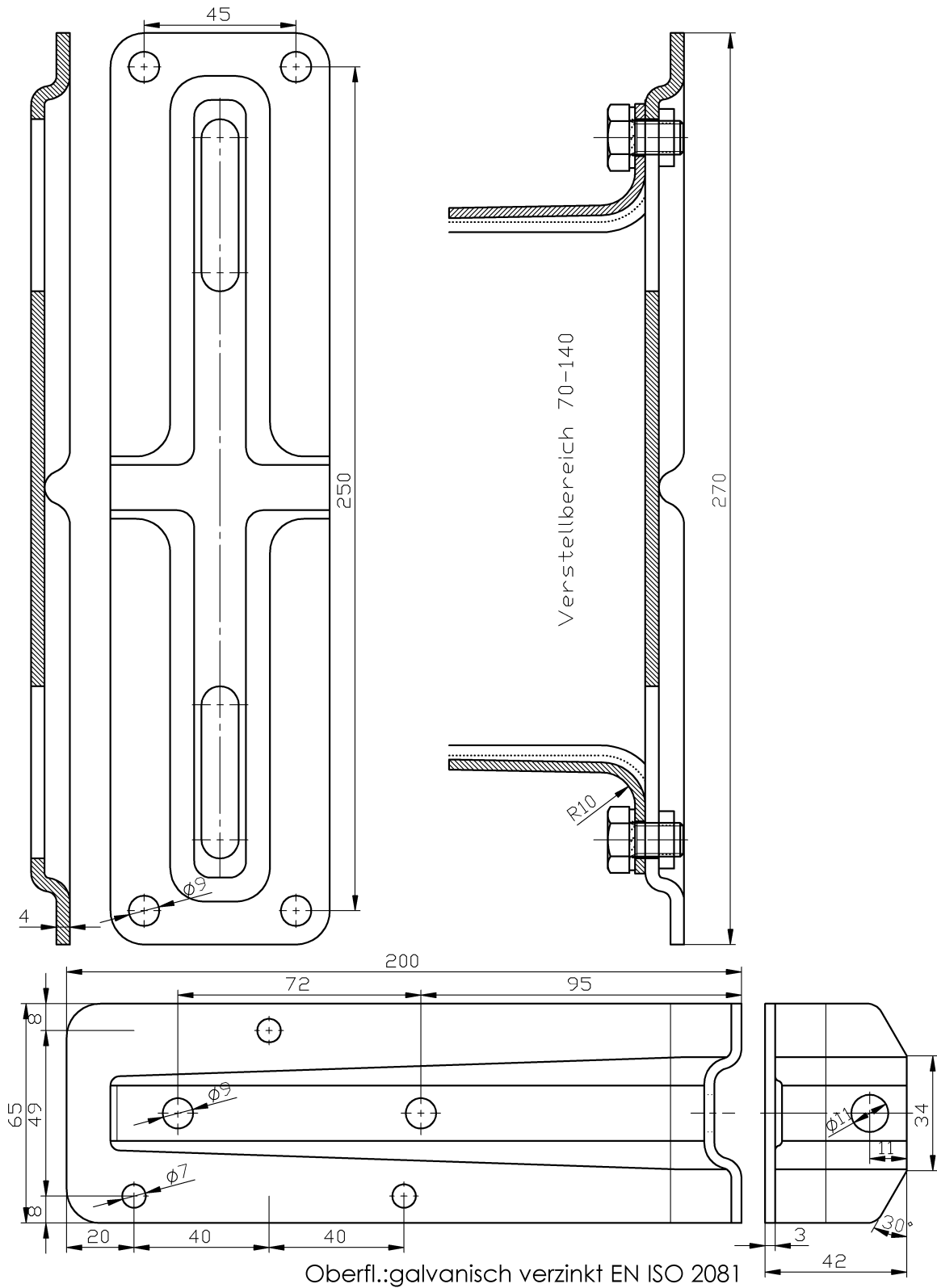
B.42 Schwere Pfostenanker H-Form 071339808CE, 071340808CE, 071342808CE



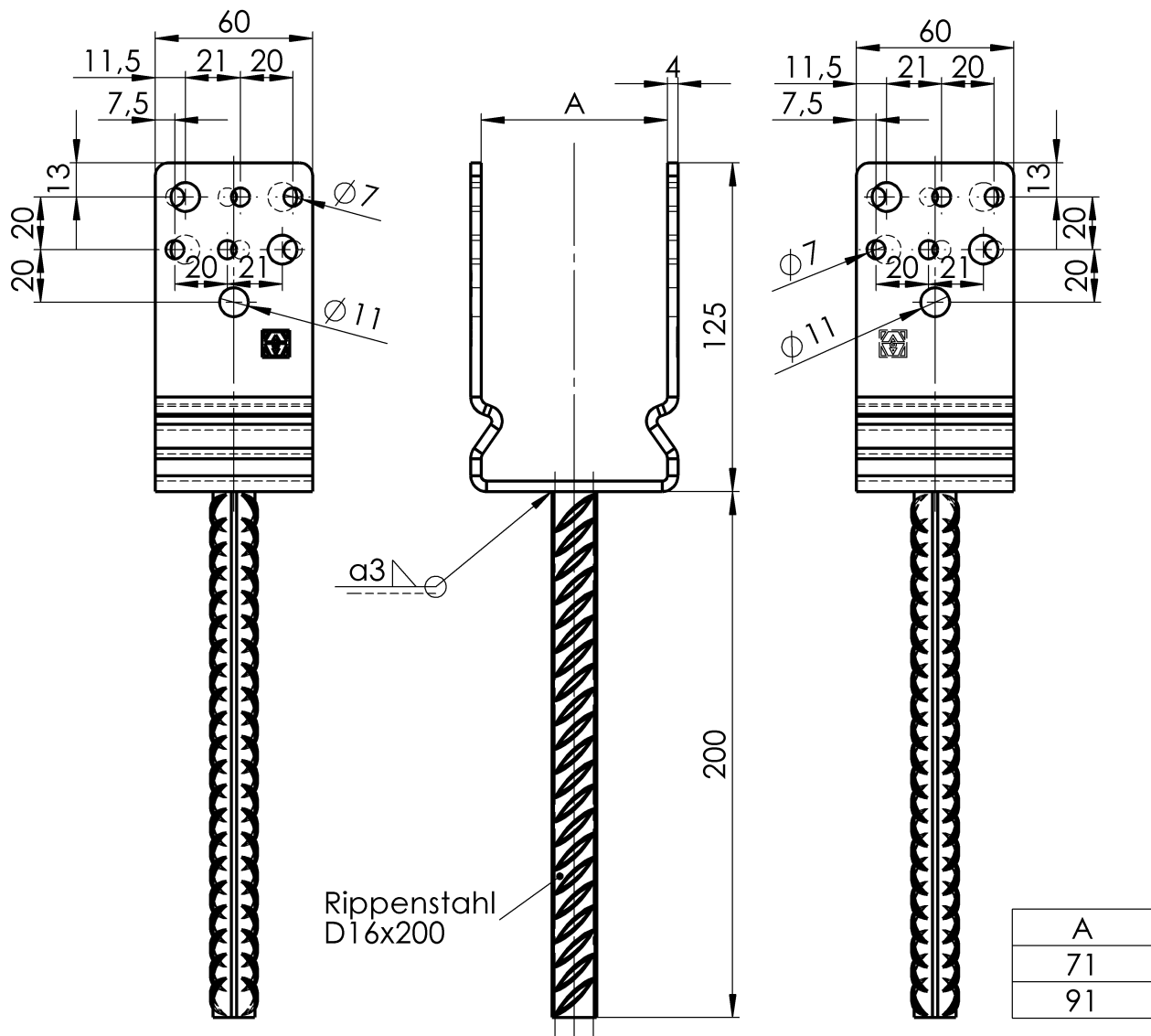
B.43 Aufschraubbare, verstellbare Stützenschuhe 071345000CE



B.44 Aufschraubbare, verstellbare Stützenschuhe 071346000CE



B.45 Stützenschuhe 071354000CE+072356000CE



Oberfl.: feuerverzinkt EN ISO 1461