



STUD WELDING IN REFRACTORY CONSTRUCTION



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1. Stud welding in refractory construction

1.1 Technical information

The welding elements shown in this catalogue are designed for drawn arc stud welding. Some welding elements are also available as model for manual welding or with thread for screwing. In each case this is explicitly indicated.

Flux (aluminium ball) and weld pool backing

According to DIN EN ISO 13918 (Welding – Studs and ceramic ferrules for arc stud welding) welding elements for drawn arc stud welding standardly have a pressed-in aluminium ball at the welding tip. This serves as flux for improved ignition and stabilization of the electric arc as well as for deoxidising the weld pool.

(Exceptions: insulation pins (type ISMS, ISA, ISB), fiberfix (type FFS, FFD) and threaded studs (type DRS, M5 and M6) do not have a pressed-in aluminium ball at the welding tip. Rectangular studs (type A, B and C) standardly do not have a pressed-in aluminium ball, but can be produced with aluminium ball on demand.)

For weld pool backing standardly ceramic ferrules are used. Accordingly, suitable ceramic ferrules are included in every welding element shipment. A ceramic ferrule can only be used once; it is removed from the welding element after welding by striking at it.

As an alternative to ceramic ferrules shielding gas can be used for weld pool backing. In this case according to DIN EN ISO 13918 welding elements without pressed-in aluminium ball at the welding tip are used (see catalogue **Welding studs – Drawn arc stud welding with shielding gas**).

Materials

We produce our welding elements for refractory construction from the following materials:

Description		Max. application temperature (air)	Tensile strength (R _m)	Yield point (R _{p0,2})
Material number	DIN/EN			
1.0116	Steel 4.8	-	≥ 420	≥ 340
1.4301	X5CrNi18-10	450-500° C	500-700	195
1.4541	X6CrNiTi18-10	450-500° C	500-730	200
1.4571	X6CrNiMoTi17-12-2	450-500° C	500-730	210
1.5415	16Mo3	530° C	440-570	265
1.4828	X14CrNiSi20-12	950-1000° C	500-750	230
1.4841	X15CrNiSi25-20	1100-1150° C	550-750	230

For welding elements from other materials please send us your inquiry or contact us.

On demand, the material properties can be verified by an inspection document (test report, inspection certificate) according to DIN EN 10204.

We are pleased to inform you about weldability to different base materials and welding parameters.

Dimensions

Welding elements dimensions are given in the measurement tables (all dimensions in mm). All standardised welding elements conform to DIN EN ISO 13918. Not standardised welding elements are supplied according to DIN EN ISO 13918. Special welding elements, which are not described, are delivered upon request.

Dimensions that are not listed in the measurement tables are delivered upon request.

For all welding elements for drawn arc stud welding the nominal length (l_1 resp. l_2) always corresponds to the length after welding. Depending on the diameter the length before welding (l_1) is larger by a weld allowance of 1 to 5 mm.

(Exception: For boiler studs (type KS) the nominal length (l_1) corresponds to the original length, i.e. the length before welding.)

For welding elements for manual welding the nominal length (l_1 resp. l_2) always corresponds to the original length, i.e. the length before welding.

**Threads**

The threads of the welding elements are cold rolled acc. to DIN 13-1 (tolerance limit 6g). For surface-treated welding elements the tolerance limit 6h can be reached.

We deliver welding elements with special threads upon request.

Weld fillet

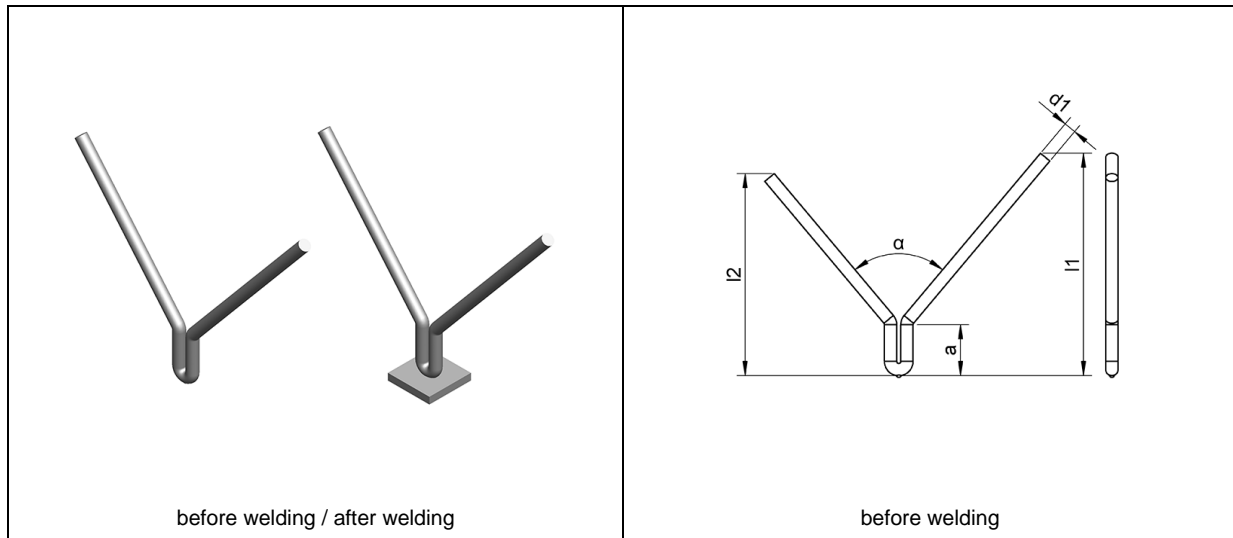
During drawn arc stud welding a fillet forms between welding element and base material. The dimensions of the weld fillet are defined by the used ceramic ferrule and the welding parameters. The diameter of the weld fillet is always bigger than the nominal diameter of the welding element.

Accessories for stud welding guns

Accessories for stud welding guns (chuck, ferrule grip, foot piece etc.) have to be adjusted to the welding element. The accessories which are to be used for the individual welding element can be found in chapter 2.

1.2 Round bar anchors

1.2.1 Round bar anchor (type CV 1)



Dimensions					Material (item number)			Ceramic ferrule
d ₁	l ₁	l ₂	α	a	1.4301	1.4828	1.4841	
6	35-250	l ₁ -15 ¹	60°	22	79-2-CV1-6-60- XXX-YYY	79-5-CV1-6-60- XXX-YYY	79-3-CV1-6-60- XXX-YYY	KFW 13x6
6	35-250	l ₁ -15 ¹	80°	22	79-2-CV1-6-80- XXX-YYY	79-5-CV1-6-80- XXX-YYY	79-3-CV1-6-80- XXX-YYY	KFW 13x6

In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

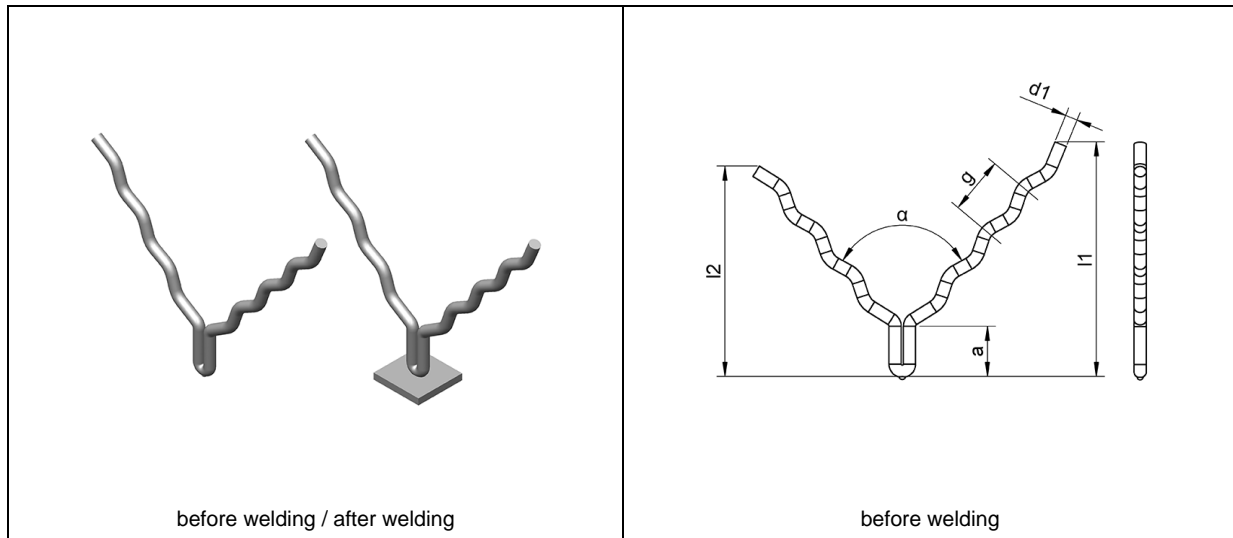
The nominal length l₁ resp. l₂ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

¹For l₁ larger than 40 mm l₂ = l₁-15 mm. For a length l₁ of 35 mm l₂ is also 35 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.2 Round bar anchor (type CV 2)



Dimensions						Material (item number)			Ceramic ferrule
d ₁	l ₁	l ₂	g	α	a	1.4301	1.4828	1.4841	
6	35-250	l ₁ -15 ¹	35	60°	22	79-2-CV2-6-60- XXX-YYY	79-5-CV2-6-60- XXX-YYY	79-3-CV2-6-60- XXX-YYY	KFW 13x6
6	35-250	l ₁ -15 ¹	35	80°	22	79-2-CV2-6-80- XXX-YYY	79-5-CV2-6-80- XXX-YYY	79-3-CV2-6-80- XXX-YYY	KFW 13x6

In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

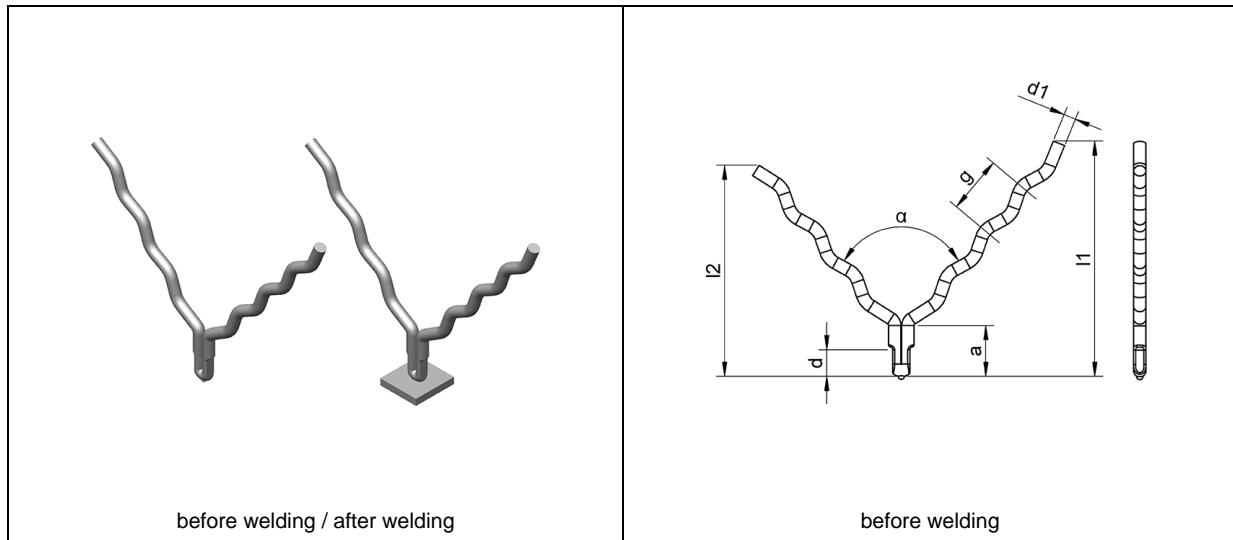
The nominal length l₁ resp. l₂ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

¹For l₁ larger than 40 mm l₂ = l₁-15 mm. For a length l₁ of 35 mm l₂ is also 35 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.3 Round bar anchor (Type CV 2 reduced)



Dimensions							Material (item number)			Ceramic ferrule
d ₁	l ₁	l ₂	d	g	α	a	1.4301	1.4828	1.4841	
6	35-250	l ₁ -15 ¹	8	35	60°	22	79-2-2R-6-60- XXX-YYY	79-5-2R-6-60- XXX-YYY	79-3-2R-6-60- XXX-YYY	UF 8 special 1/ UF 8 special 2
6	35-250	l ₁ -15 ¹	8	35	80°	22	79-2-2R-6-80- XXX-YYY	79-5-2R-6-80- XXX-YYY	79-3-2R-6-80- XXX-YYY	UF 8 special 1/ UF 8 special 2

In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

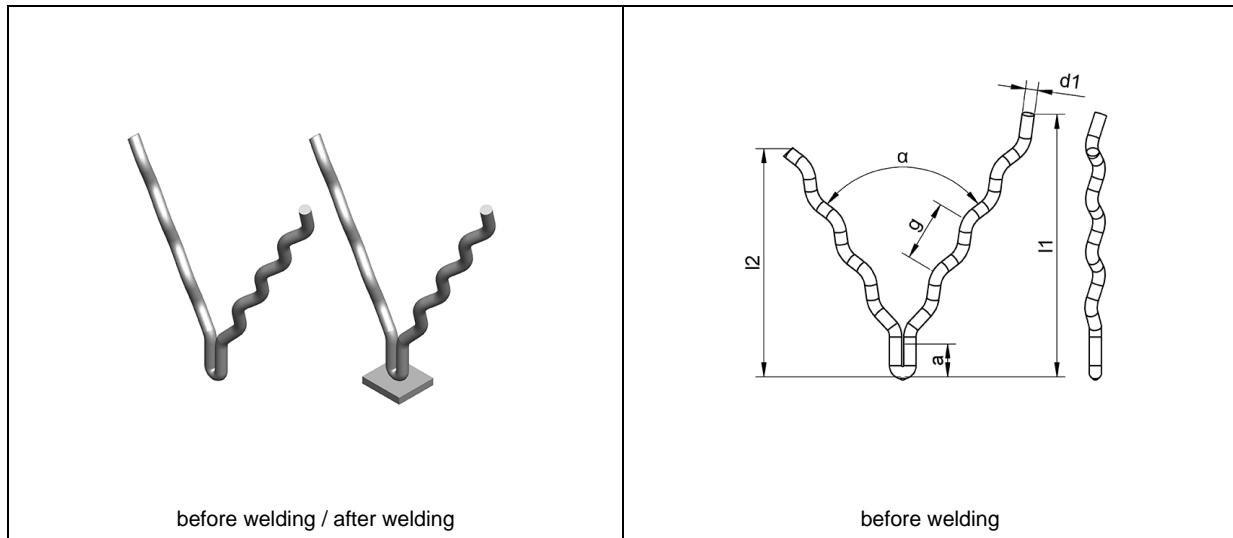
The nominal length l₁ resp. l₂ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

¹For l₁ larger than 40 mm l₂ = l₁-15 mm. For a length l₁ of 35 mm l₂ is also 35 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.4 Round bar anchor (type CV 3)



Dimensions						Material (item number)			Ceramic ferrule
d ₁	l ₁	l ₂	g	α	a	1.4301	1.4828	1.4841	
6	35-250	l ₁ -15 ¹	35	60°	22	79-2-CV3-6-60-XXX-YYY	79-5-CV3-6-60-XXX-YYY	79-3-CV3-6-60-XXX-YYY	KFW 13x6
6	35-250	l ₁ -15 ¹	35	80°	22	79-2-CV3-6-80-XXX-YYY	79-5-CV3-6-80-XXX-YYY	79-3-CV3-6-80-XXX-YYY	KFW 13x6

In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

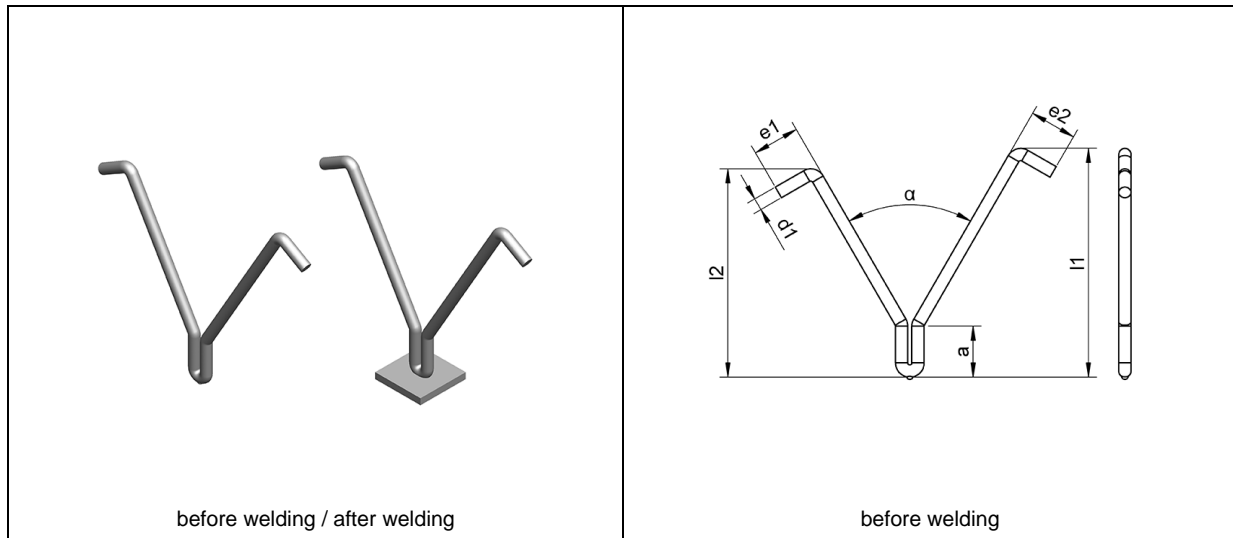
The nominal length l₁ resp. l₂ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

¹For l₁ larger than 40 mm l₂ = l₁-15 mm. For a length l₁ of 35 mm l₂ is also 35 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.5 Round bar anchor (type CV 4)



Dimensions							Material (item number)			Ceramic ferrule
d ₁	l ₁	l ₂	e ₁	e ₂	α	a	1.4301	1.4828	1.4841	
6	35-250	l ₁ -15 ¹	10-20	10-20	60°	22	79-2-CV4-6-60-XXX-YYY	79-5-CV4-6-60-XXX-YYY	79-3-CV4-6-60-XXX-YYY	KFW 13x6
6	35-250	l ₁ -15 ¹	10-20	10-20	80°	22	79-2-CV4-6-80-XXX-YYY	79-5-CV4-6-80-XXX-YYY	79-3-CV4-6-80-XXX-YYY	KFW 13x6

In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

The nominal length l₁ resp. l₂ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

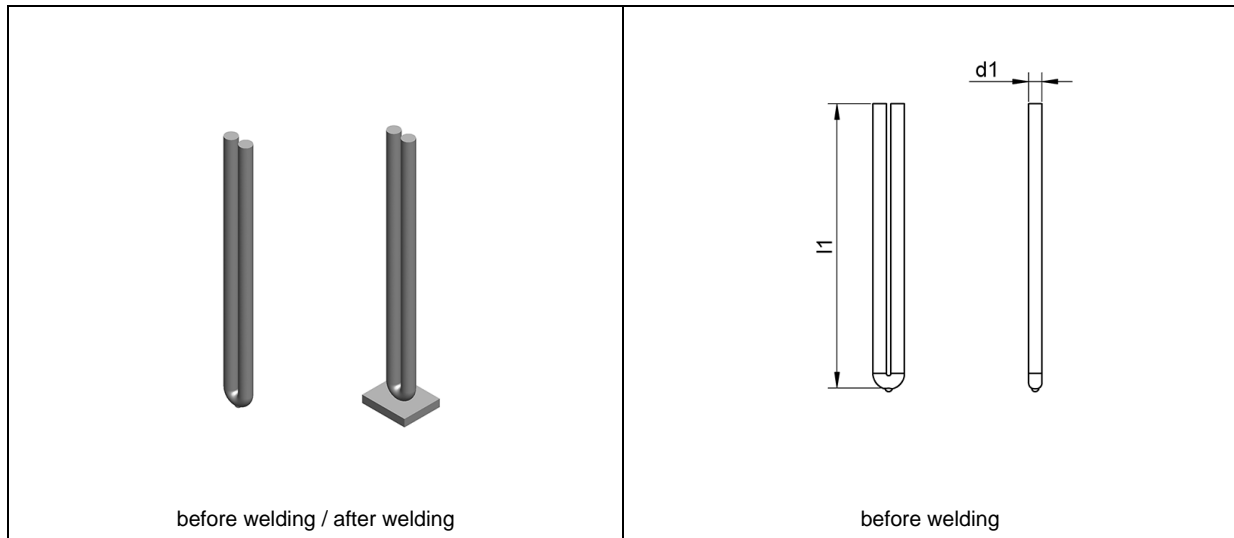
¹For l₁ larger than 40 mm l₂ = l₁-15 mm. For a length l₁ of 35 mm l₂ is also 35 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.



1.2.6 Round bar anchor (type STP)



Dimensions		Material (item number)			Ceramic ferrule
d_1	l_1	1.4301	1.4828	1.4841	
6	50-250	79-2-STP-6-XXX	79-5-STP-6-XXX	79-3-STP-6-XXX	KFW 13x6

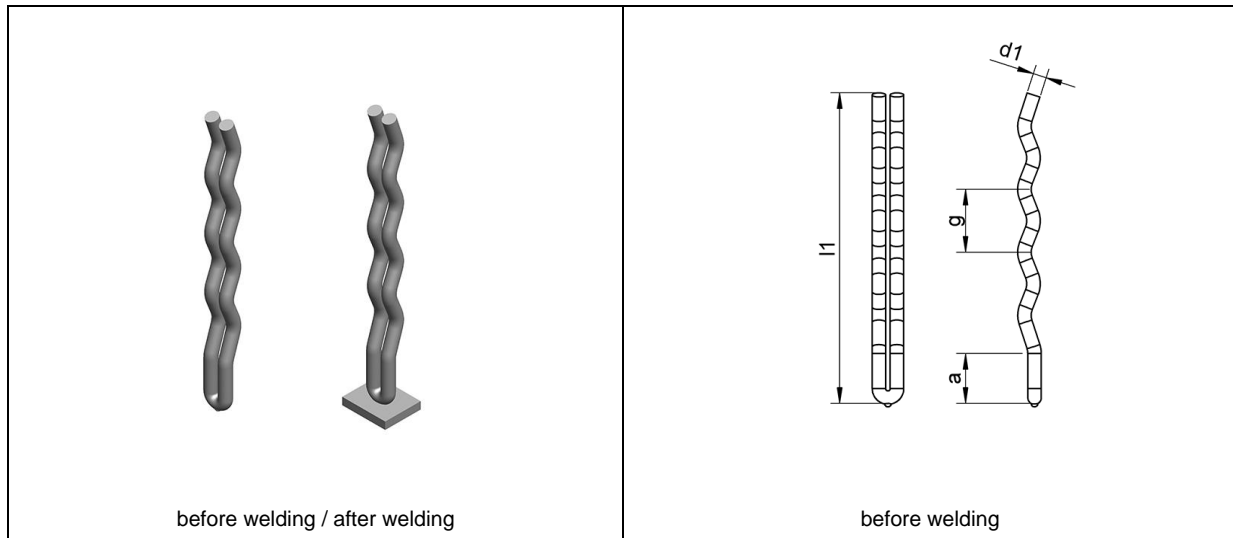
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm).

The nominal length l_1 is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.7 Round bar anchor (type CTP)



Dimensions				Material (item number)			Ceramic ferrule
d ₁	l ₁	g	a	1.4301	1.4828	1.4841	
6	50-250	35	22-50	79-2-CTP-6- XXX(YY)	79-5-CTP-6- XXX(YY)	79-3-CTP-6- XXX(YY)	KFW 13x6

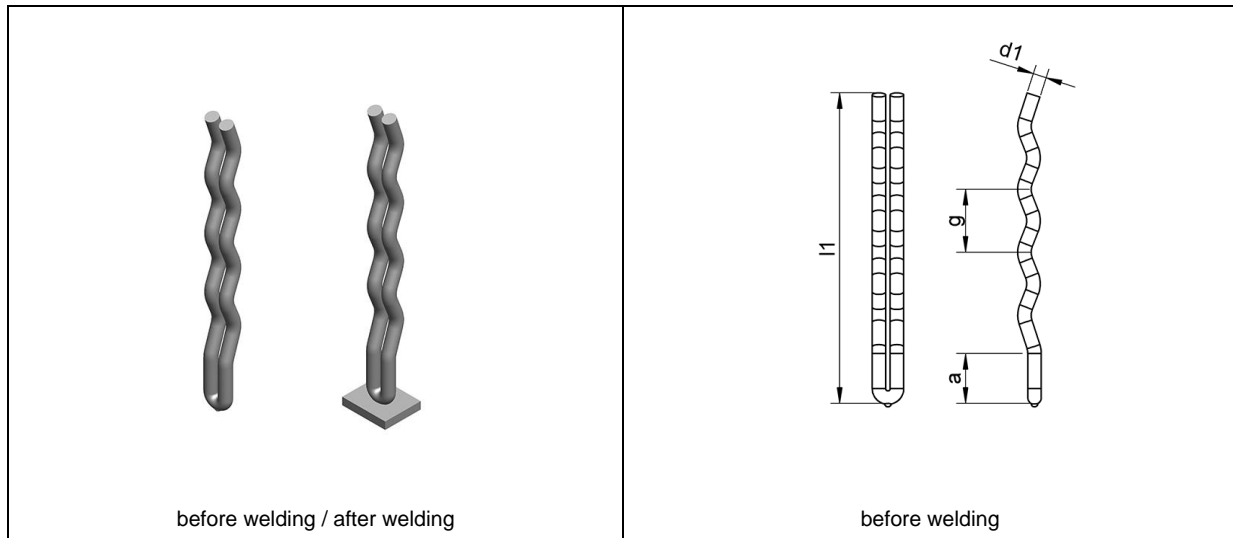
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

The nominal length l₁ is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.8 Round bar anchor (type HTP)



Dimensions				Material (item number)			Ceramic ferrule
d_1	l_1	g	a	1.4301	1.4828	1.4841	
8	50-250	35	22-50	79-2-HTP-8- XXX(YY)	79-5-HTP-8- XXX(YY)	79-3-HTP-8- XXX(YY)	KFW 17x8

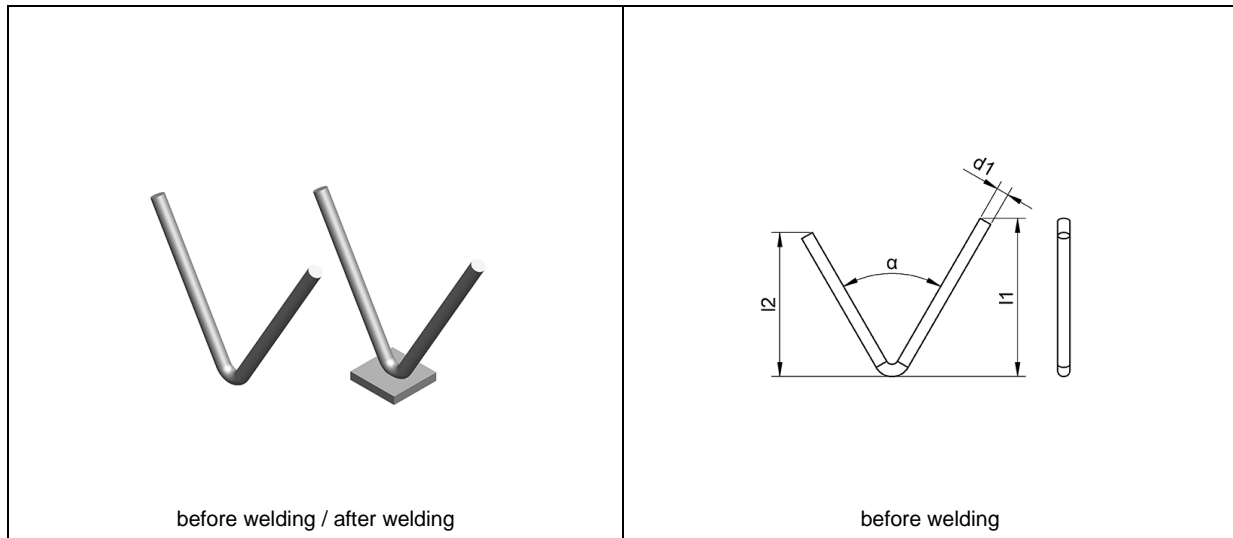
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

The nominal length l_1 is the length after welding. The original length, i.e. the length before welding, is larger by a weld allowance of 3 mm.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.9 Round bar anchor (type V 1) (for manual welding)



Round bar anchor V 1 (for manual welding)

Dimensions				Material (item number)		
d_1	l_1	l_2	α	1.4301	1.4828	1.4841
6	35-250	l_1-15^1	60°	79-2-V1-6-60-XXX-YYY	79-5-V1-6-60-XXX-YYY	79-3-V1-6-60-XXX-YYY
6	35-250	l_1-15^1	80°	79-2-V1-6-80-XXX-YYY	79-5-V1-6-80-XXX-YYY	79-3-V1-6-80-XXX-YYY

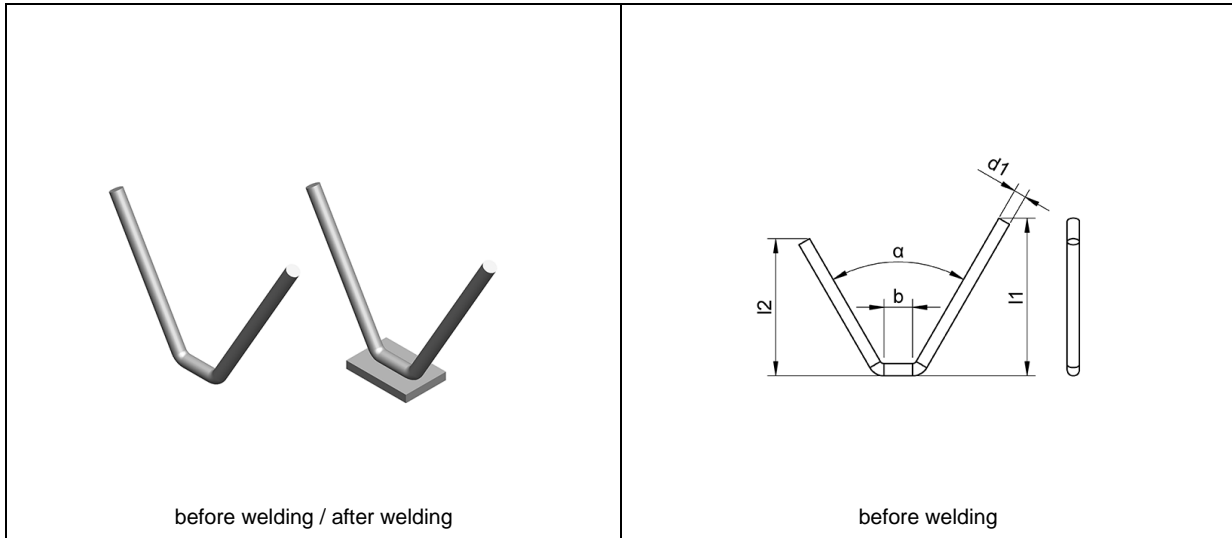
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YYY** by the respective leg length l_2 (e.g. 060 for 60 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 resp. l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.10 Round bar anchor (type V 2) (for manual welding)



Round bar anchor V 2 (for manual welding)

Dimensions					Material (item number)		
d ₁	l ₁	l ₂	α	b	1.4301	1.4828	1.4841
6	35-250	l ₁ -15 ¹	60°	18	79-2-V2-6-60-XXX-YYY	79-5-V2-6-60-XXX-YYY	79-3-V2-6-60-XXX-YYY
6	35-250	l ₁ -15 ¹	80°	18	79-2-V2-6-80-XXX-YYY	79-5-V2-6-80-XXX-YYY	79-3-V2-6-80-XXX-YYY

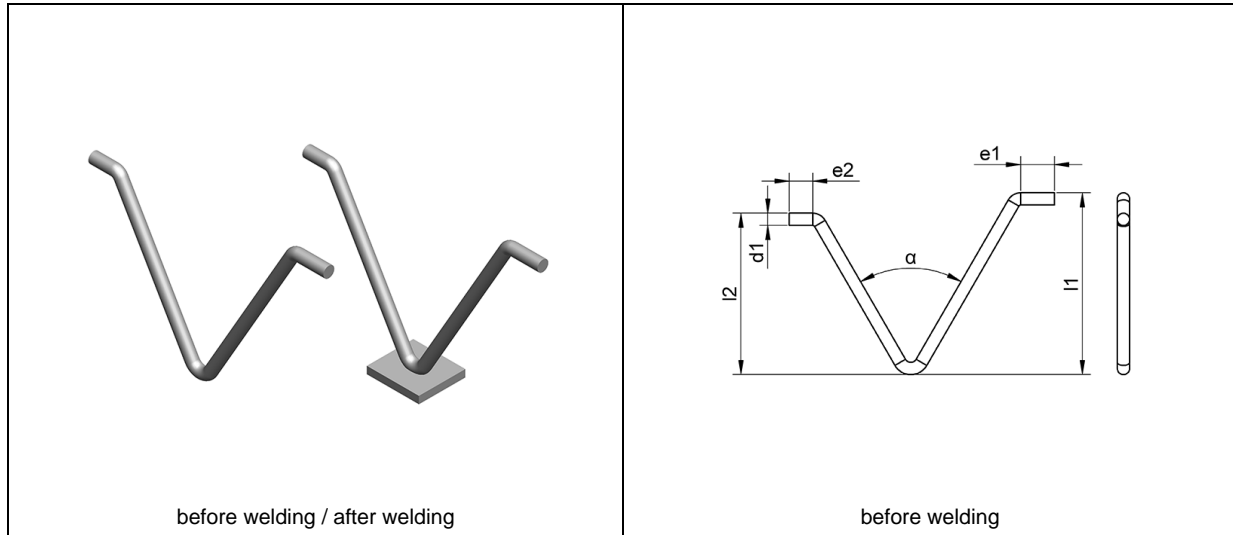
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁ resp. l₂.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.11 Round bar anchor (type V 3) (for manual welding)



Round bar anchor V 3 (for manual welding)

Dimensions						Material (item number)		
d ₁	l ₁	l ₂	e ₁	e ₂	α	1.4301	1.4828	1.4841
6	35-250	l ₁ -15 ¹	10-20	10-20	60°	79-2-V3-6-60-XXX-YYY-AA-BB	79-5-V3-6-60-XXX-YYY-AA-BB	79-3-V3-6-60-XXX-YYY-AA-BB
6	35-250	l ₁ -15 ¹	10-20	10-20	80°	79-2-V3-6-80-XXX-YYY-AA-BB	79-5-V3-6-80-XXX-YYY-AA-BB	79-3-V3-6-80-XXX-YYY-AA-BB

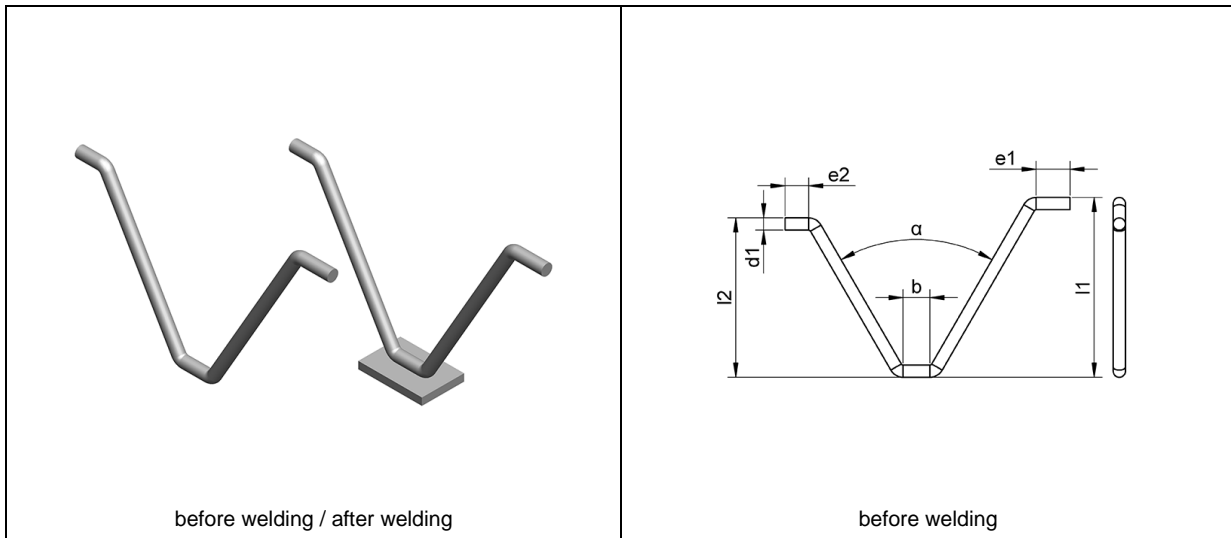
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm) as well as **AA** by the dimension e₁ and **BB** by the dimension e₂.

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁ resp. l₂.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.12 Round bar anchor (type V 4) (for manual welding)



Round bar anchor V 4 (for manual welding)

Dimensions							Material (item number)		
d ₁	l ₁	l ₂	e ₁	e ₂	α	b	1.4301	1.4828	1.4841
6	35-250	l ₁ -15 ¹	10-20	10-20	60°	18	79-2-V4-6-60-XXX-YYY-AA-BB	79-5-V4-6-60-XXX-YYY-AA-BB	79-3-V4-6-60-XXX-YYY-AA-BB
6	35-250	l ₁ -15 ¹	10-20	10-20	80°	18	79-2-V4-6-80-XXX-YYY-AA-BB	79-5-V4-6-80-XXX-YYY-AA-BB	79-3-V4-6-80-XXX-YYY-AA-BB

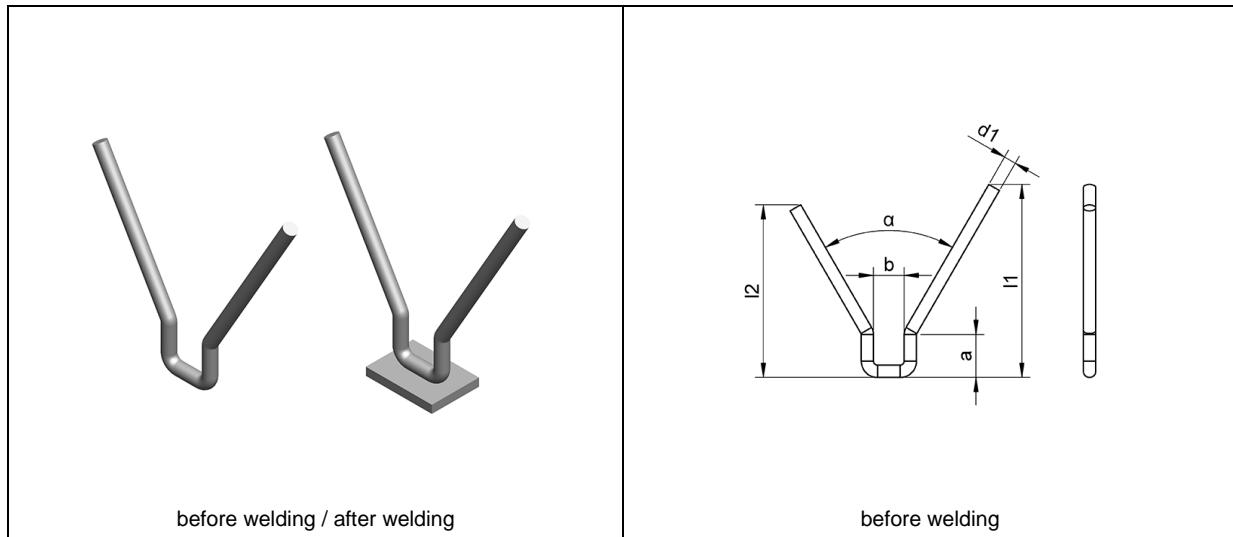
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm) as well as **AA** by the dimension e₁ and **BB** by the dimension e₂.

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁ resp. l₂.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.13 Round bar anchor (type CH 1) (for manual welding)



Round bar anchor CH 1 (for manual welding)

Dimensions						Material (item number)		
d ₁	l ₁	l ₂	α	a	b	1.4301	1.4828	1.4841
6	40-250	l ₁ -15	60°	22	13	79-2-CH1-6-60- XXX-YYY	79-5-CH1-6-60- XXX-YYY	79-3-CH1-6-60- XXX-YYY
6	40-250	l ₁ -15	80°	22	13	79-2-CH1-6-80- XXX-YYY	79-5-CH1-6-80- XXX-YYY	79-3-CH1-6-80- XXX-YYY

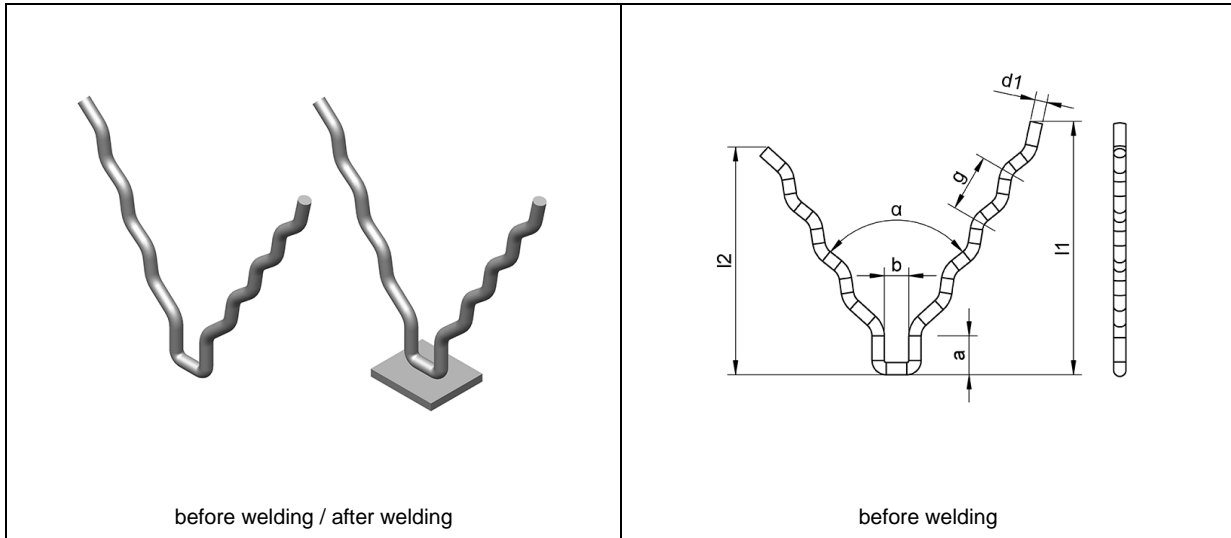
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁ resp. l₂.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.14 Round bar anchor (type CH 2) (for manual welding)



Round bar anchor CH 2 (for manual welding)

Dimensions							Material (item number)		
d_1	l_1	l_2	g	α	a	b	1.4301	1.4828	1.4841
6	40-250	l_1-15	35	60°	18	13	79-2-CH2-6-60-XXX-YYY	79-5-CH2-6-60-XXX-YYY	79-3-CH2-6-60-XXX-YYY
6	40-250	l_1-15	35	80°	18	13	79-2-CH2-6-80-XXX-YYY	79-5-CH2-6-80-XXX-YYY	79-3-CH2-6-80-XXX-YYY

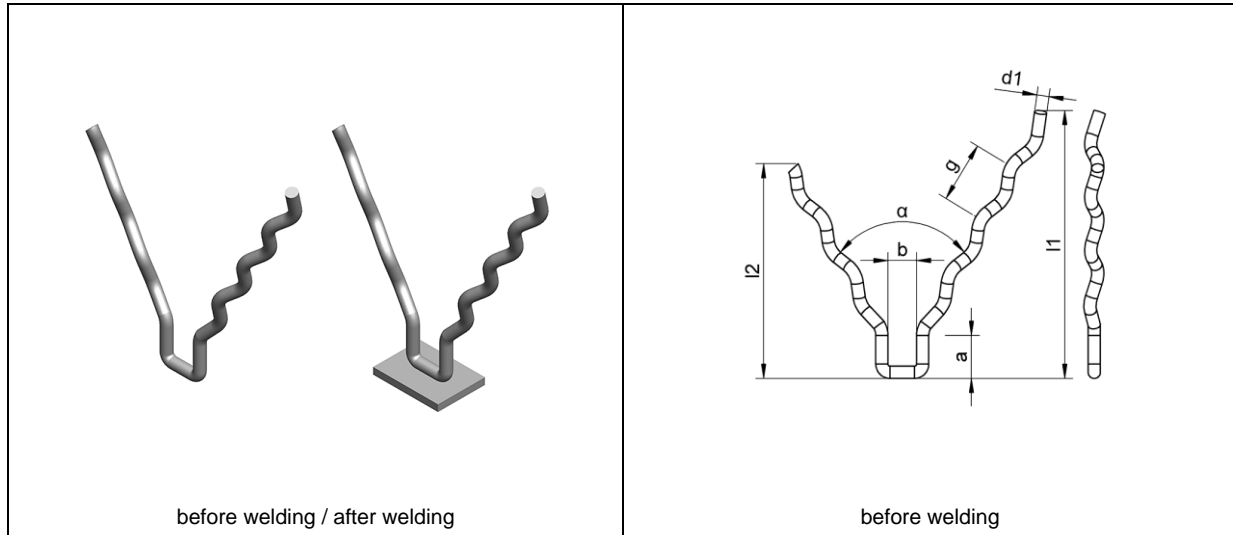
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YYY** by the respective leg length l_2 (e.g. 060 for 60 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 resp. l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.15 Round bar anchor (type CH 3) (for manual welding)



Round bar anchor CH 3 (for manual welding)

Dimensions							Material (item number)		
d ₁	l ₁	l ₂	g	α	a	b	1.4301	1.4828	1.4841
6	40-250	l ₁ -15	35	60°	18	13	79-2-CH3-6-60-XXX-YYY	79-5-CH3-6-60-XXX-YYY	79-3-CH3-6-60-XXX-YYY
6	40-250	l ₁ -15	35	80°	18	13	79-2-CH3-6-80-XXX-YYY	79-5-CH3-6-80-XXX-YYY	79-3-CH3-6-80-XXX-YYY

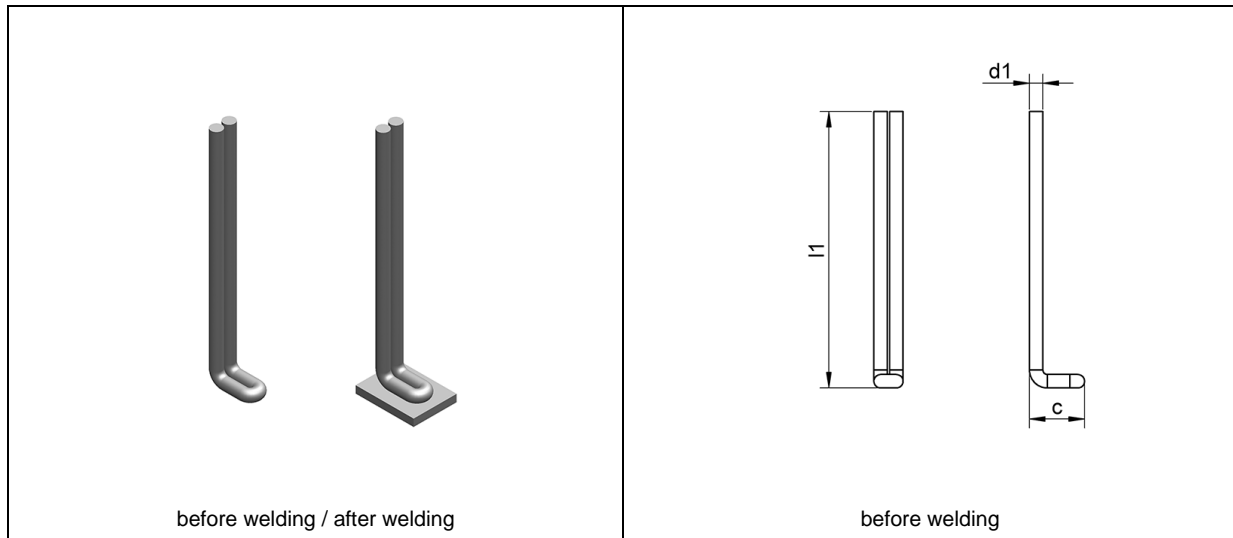
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm) and **YYY** by the respective leg length l₂ (e.g. 060 for 60 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁ resp. l₂.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.16 Round bar anchor (type STH) (for manual welding)



Round bar anchor STH (for manual welding)

Dimensions			Material (item number)		
d_1	l_1	c	1.4301	1.4828	1.4841
6	40-250	25	79-2-STH-6-XXX	79-5-STH-6-XXX	79-3-STH-6-XXX

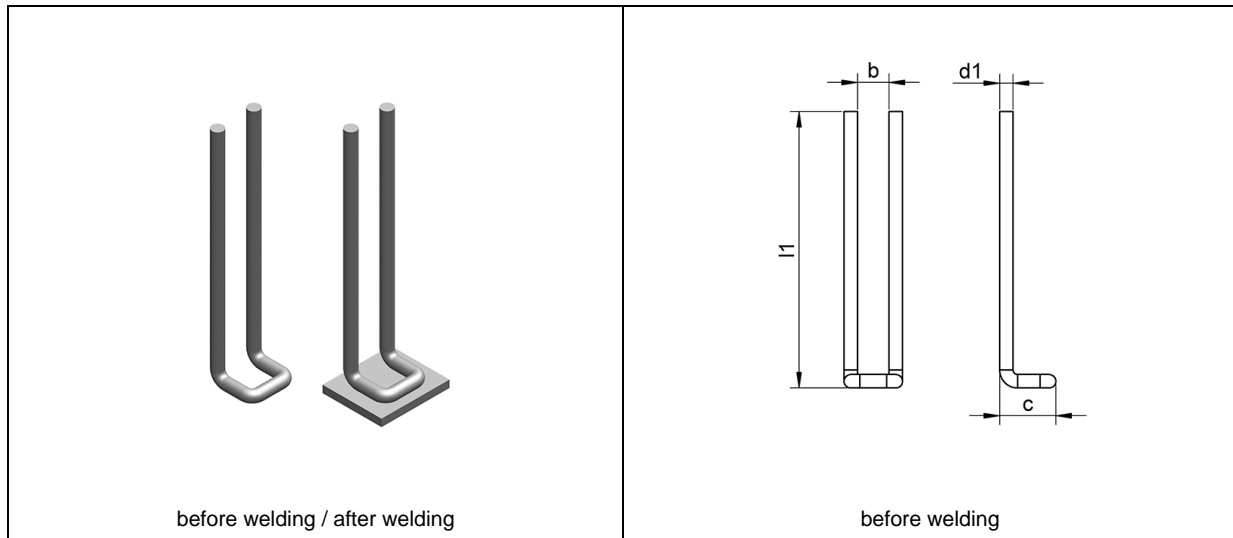
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.17 Round bar anchor (type STB) (for manual welding)



Round bar anchor STB (for manual welding)

Dimensions				Material (item number)		
d ₁	l ₁	c	b	1.4301	1.4828	1.4841
6	40-250	40	13	79-2-STB-6-XXX	79-5-STB-6-XXX	79-3-STB-6-XXX

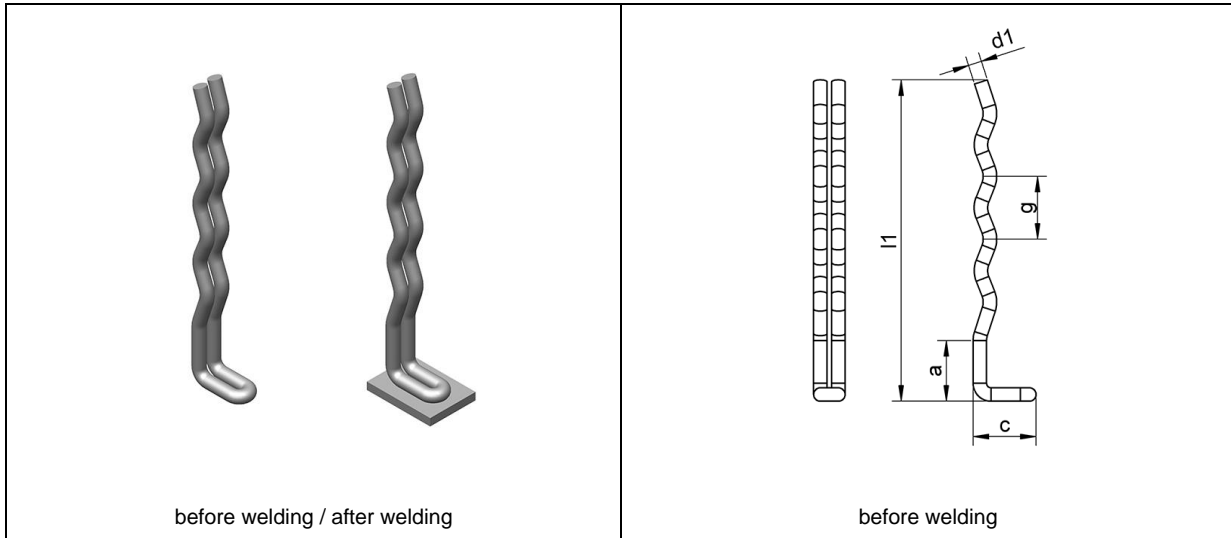
In the item number **XXX** has to be replaced by the respective leg length l₁ (e.g. 075 for 75 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l₁.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.18 Round bar anchor (type CTH) (for manual welding)



Round bar anchor CTH (for manual welding)

Dimensions					Material (item number)		
d_1	l_1	g	a	c	1.4301	1.4828	1.4841
6	40-250	35	22-50	25	79-2-CTH-6-XXX(YY)	79-5-CTH-6-XXX(YY)	79-3-CTH-6-XXX(YY)

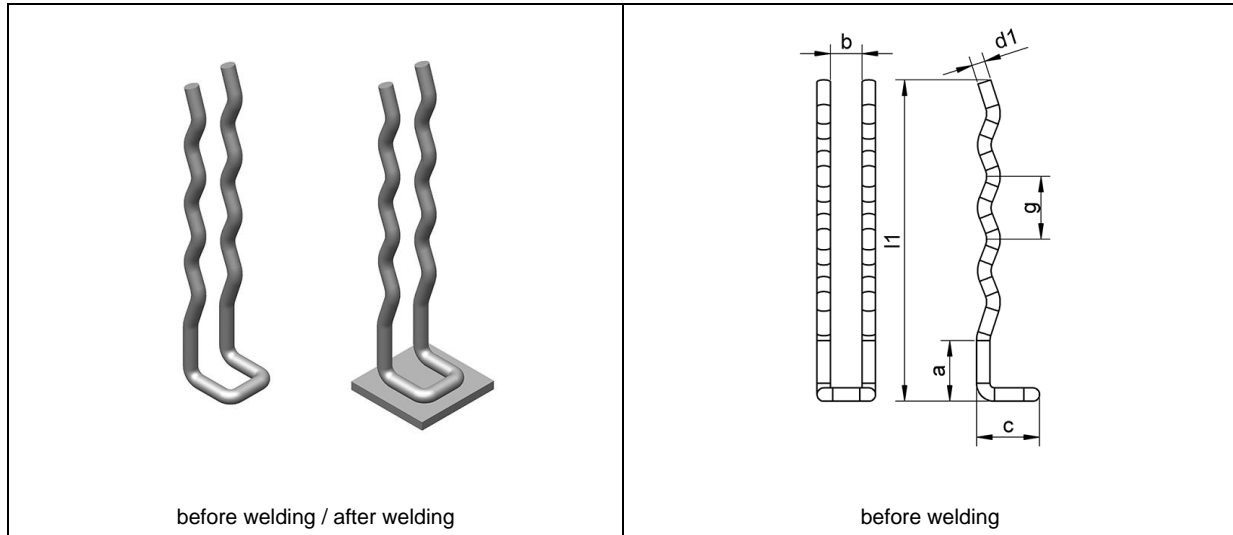
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.19 Round bar anchor (type CTB) (for manual welding)



Round bar anchor CTB (for manual welding)

Dimensions						Material (item number)		
d ₁	l ₁	g	a	c	b	1.4301	1.4828	1.4841
6	40-250	35	22-50	40	13	79-2-CTB-6-XXX(YY)	79-5-CTB-6-XXX(YY)	79-3-CTB-6-XXX(YY)

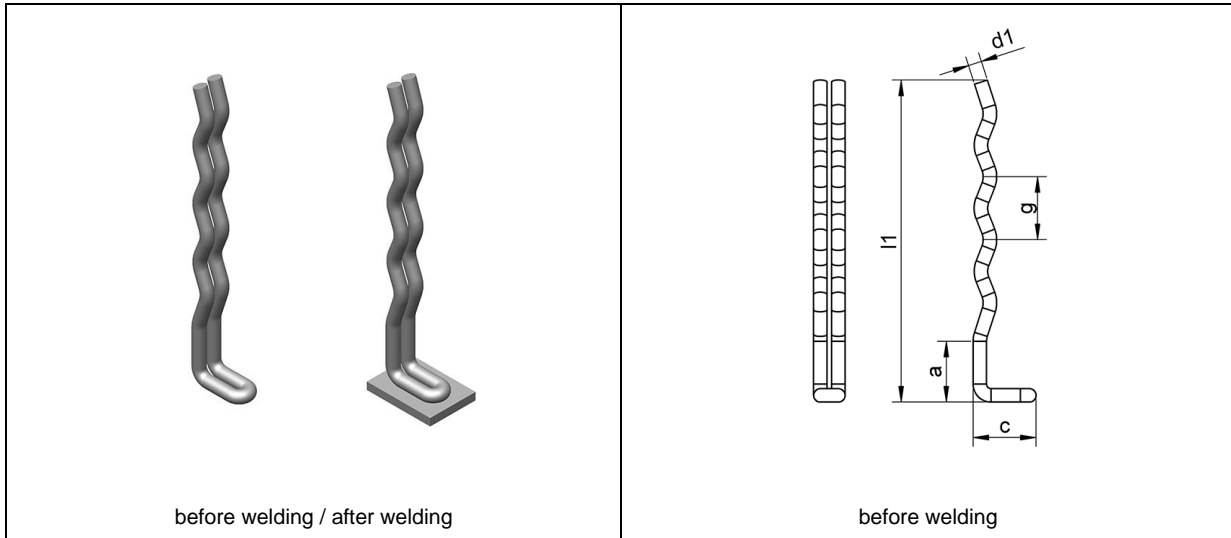
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.20 Round bar anchor (type HTH) (for manual welding)



Round bar anchor HTH (for manual welding)

Dimensions					Material (item number)		
d_1	l_1	g	a	c	1.4301	1.4828	1.4841
8	40-250	35	22-50	25	79-2-HTH-8-XXX(YY)	79-5-HTH-8-XXX(YY)	79-3-HTH-8-XXX(YY)

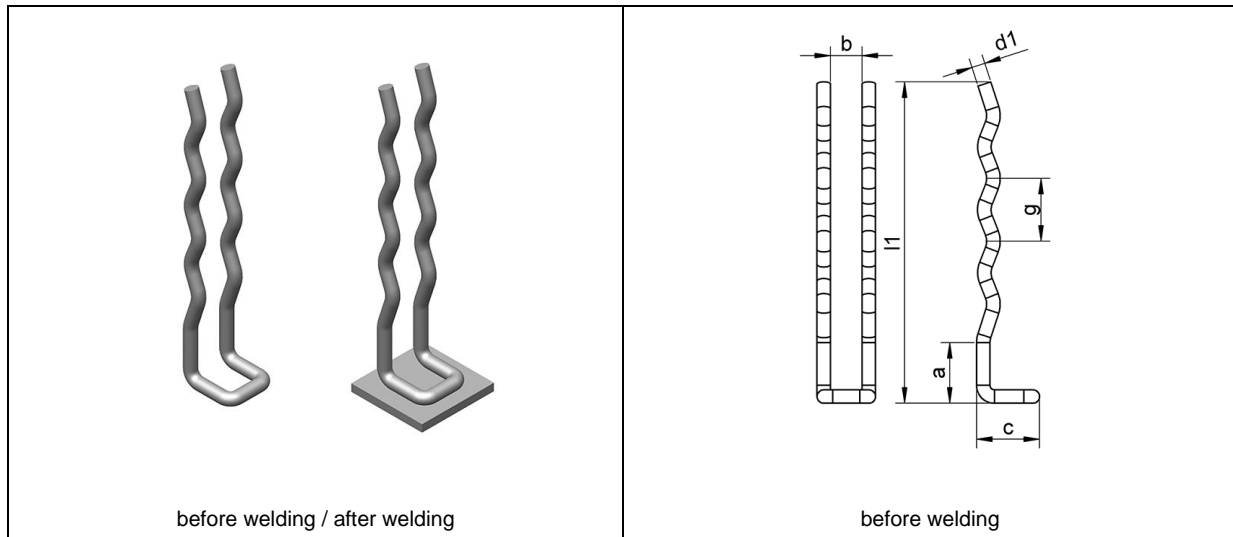
In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.2.21 Round bar anchor (type HTB) (for manual welding)



Round bar anchor HTB (for manual welding)

Dimensions						Material (item number)		
d ₁	l ₁	g	a	c	b	1.4301	1.4828	1.4841
8	40-250	35	22-50	40	13	79-2-HTB-8-XXX(YY)	79-5-HTB-8-XXX(YY)	79-3-HTB-8-XXX(YY)

In the item number **XXX** has to be replaced by the respective leg length l_1 (e.g. 075 for 75 mm) and **YY** by the respective step length a (e.g. 22 for 22 mm).

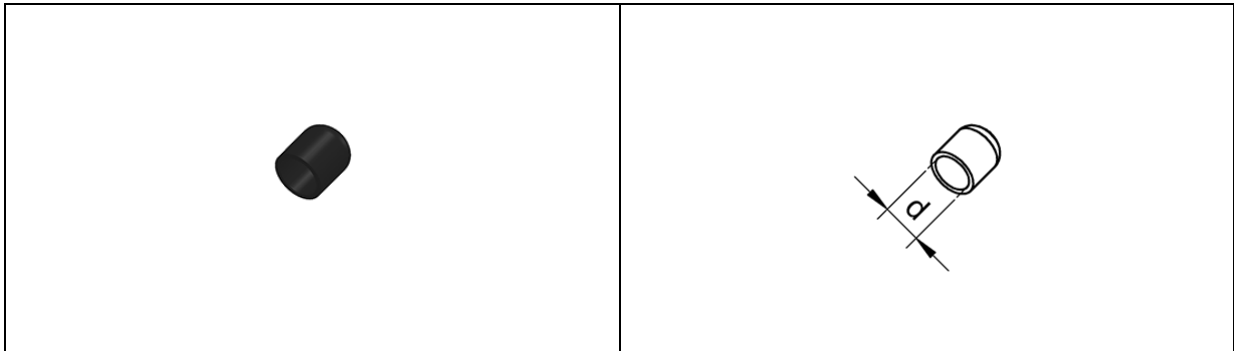
Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.



1.2.22 Plastic cap for round bar anchor

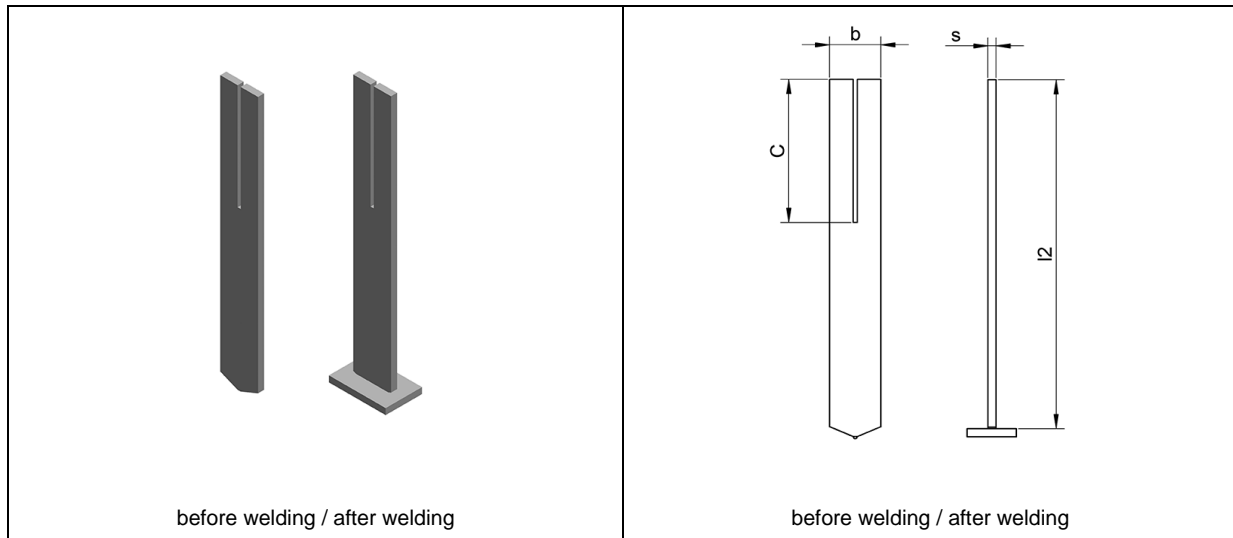


Dimensions	Item number
d ₁	
6	KSK-M 6X12,7
8	KSK-M 8X12,7

Not listed dimensions available upon request.

1.3 Flat bar anchors

1.3.1 Flat bar anchor (type YHA)



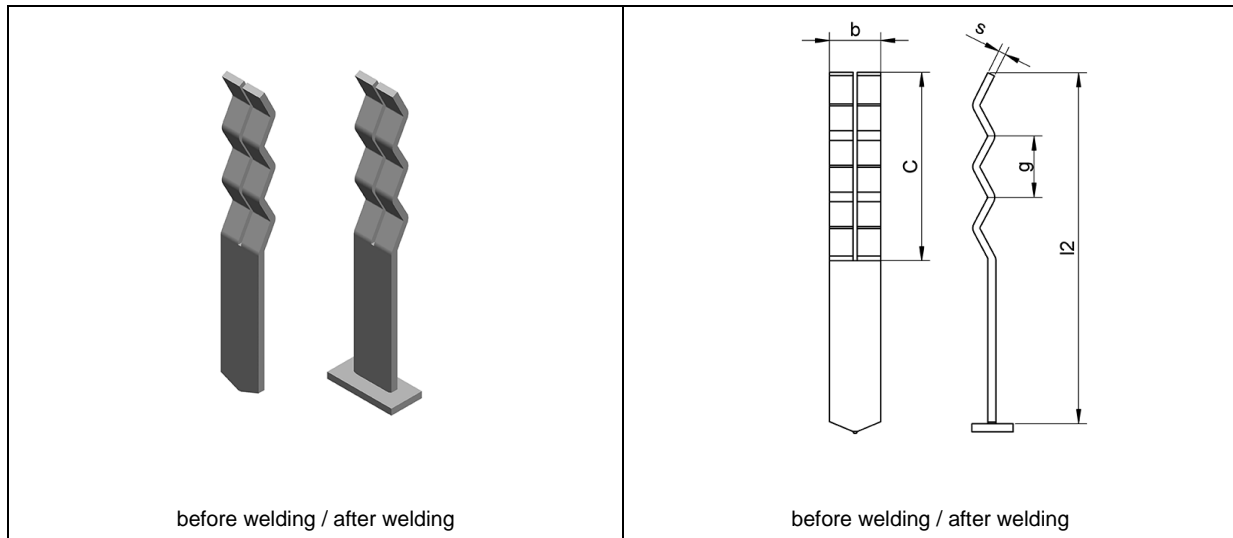
Dimensions				Material (item number)			Ceramic ferrule
b	l ₂	s	C	1.4301	1.4828	1.4841	
15	50-250	3	15-50	60-5-15-3-XXX-C-YHA	60-2-15-3-XXX-C-YHA	60-3-15-3-XXX-C-YHA	KF 15x3

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **C** by the respective slot length.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.3.2 Flat bar anchor (type YHB)



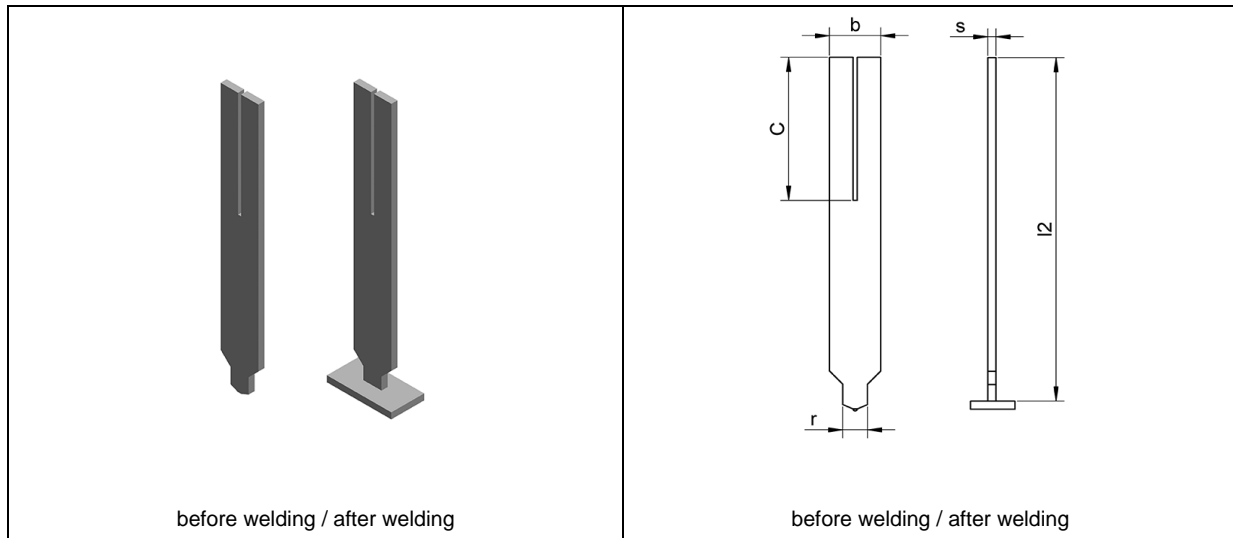
Dimensions					Material (item number)			Ceramic ferrule
b	l ₂	s	C	g	1.4301	1.4828	1.4841	
15	50-250	3	15-50	35	60-5-15-3-XXX-C-YHB	60-2-15-3-XXX-C-YHB	60-3-15-3-XXX-C-YHB	KF 15x3

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **C** by the respective slot length.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.3.3 Flat bar anchor (type YRA)



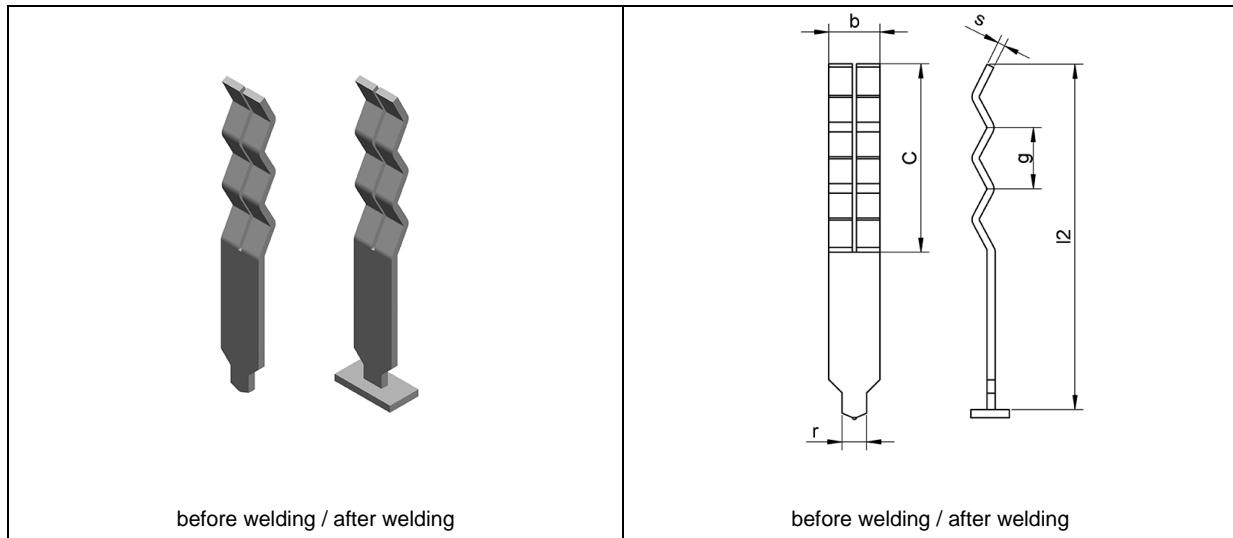
Dimensions					Material (item number)			Ceramic ferrule
b	l ₂	s	C	r	1.4301	1.4828	1.4841	
15	50-250	3	15-50	15	60-5-15-3-XXX-C-YRA	60-2-15-3-XXX-C-YRA	60-3-15-3-XXX-C-YRA	KF 15x3

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **C** by the respective slot length.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.3.4 Flat bar anchor (type YRB)



Dimensions						Material (item number)			Ceramic ferrule
b	l ₂	s	C	g	r	1.4301	1.4828	1.4841	
15	50-250	3	15-50	35	15	60-5-15-3-XXX- C-YRB	60-2-15-3-XXX- C-YRB	60-3-15-3-XXX- C-YRB	KF 15x3

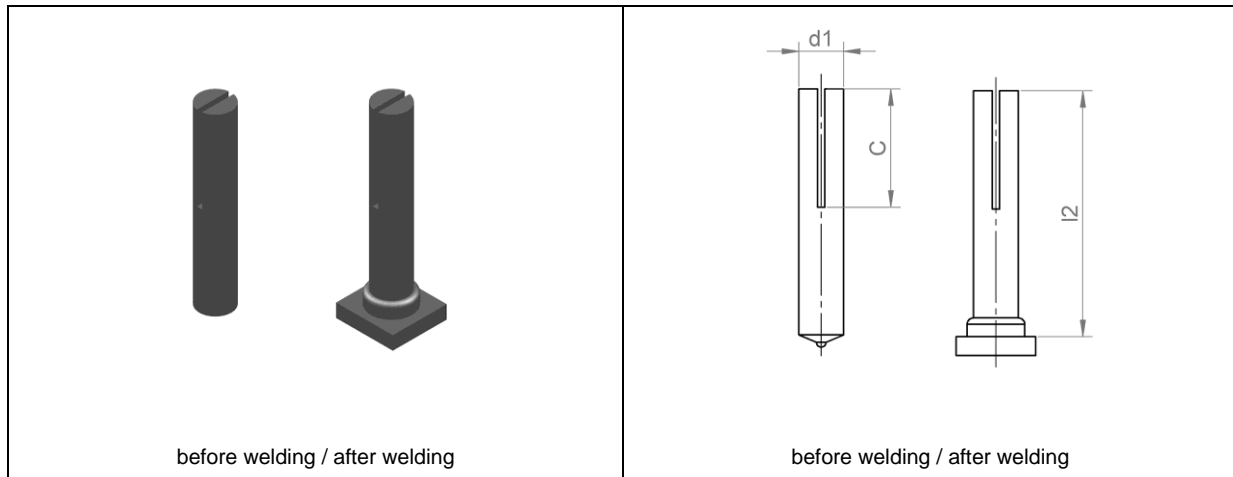
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **C** by the respective slot length.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.4 Slotted studs

1.4.1 Slotted stud (type SF)



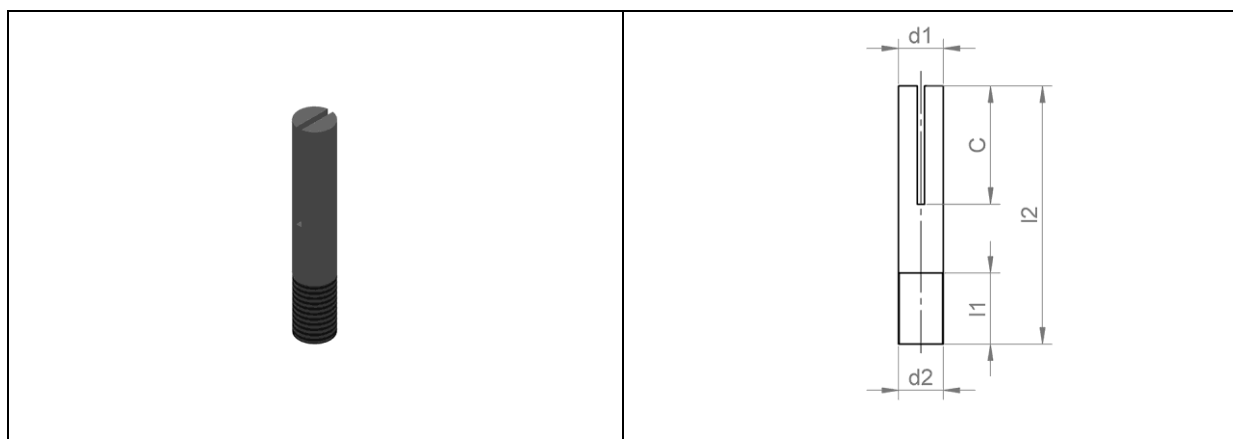
Dimensions			Material (item number)				Ceramic ferrule
d ₁	l ₂	C	Steel 4.8	1.4301	1.4828	1.4841	
10	25-250	15-50	55-10-4-XXX-C	55-10-3-XXX-C	55-10-6-XXX-C	55-10-2-XXX-C	UF 10

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **C** by the respective slot length.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.4.2 Slotted stud with thread (type SFG)



Slotted stud – with thread (for the use with internally threaded stud (type ID))

Dimensions					Material (item number)			
d ₁	l ₂	C	d ₂	l ₁	Steel 4.8	1.4301	1.4828	1.4841
10	25-250	15-50	M10	10-30	55-10-4-XXX-C-G	55-10-3-XXX-C-G	55-10-6-XXX-C-G	55-10-2-XXX-C-G

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) as well as **C** by the respective slot length and **G** by the respective thread length l_1 .

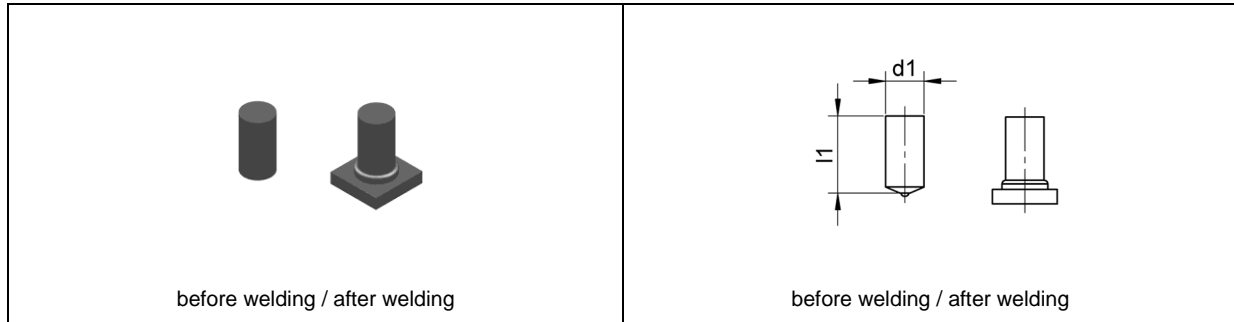
Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

Internally threaded studs (type ID), see chapter 1.10.2.



1.5 Boiler stud (type KS)



Dimensions		Material (item number)				Ceramic ferrule
d_1	l_1	Steel 4.8	1.4301	1.4828	1.4841	
8	14-50	15-1-08-XXX	15-9-08-XXX	15-5-08-XXX	15-6-08-XXX	UF 8
10	14-50	15-1-10-XXX	15-9-10-XXX	15-5-10-XXX	15-6-10-XXX	UF 10
12	14-50	15-1-12-XXX	15-9-12-XXX	15-5-12-XXX	15-6-12-XXX	UF 12

In the item number **XXX** has to be replaced by the respective welding element length l_1 (e.g. 030 for 30 mm).

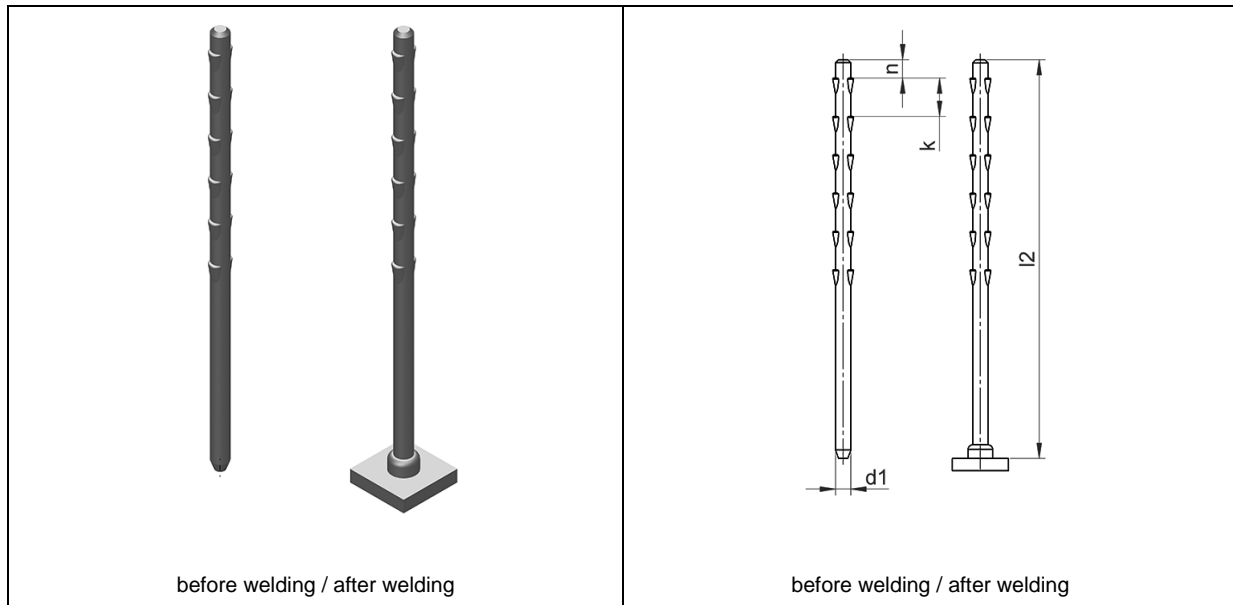
Deviant from all other welding elements for drawn arc stud welding for boiler studs (type KS) the original length, i.e. the length before welding, is always stated as the nominal length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.6 Fiberfix and clips

1.6.1 Fiberfix (type FFS)



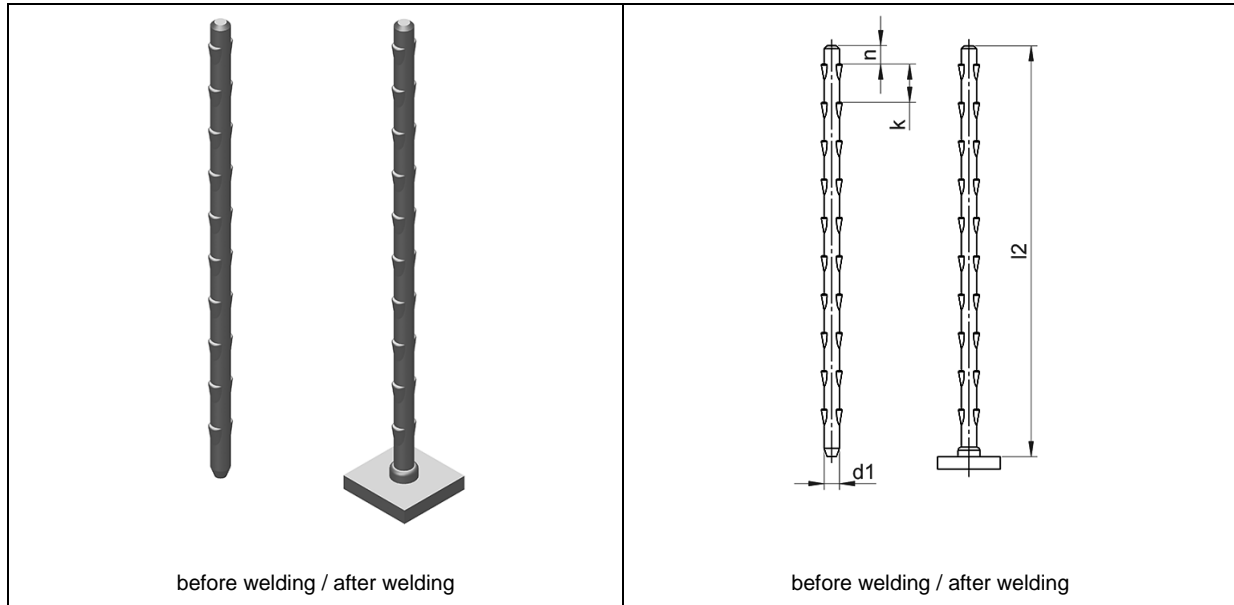
Dimensions				Material (item number)			Ceramic ferrule
d ₁	l ₂	k	n	1.4301	1.4828	1.4841	
5	50-400	12,5	6	50-15- XXX	50-65- XXX	50-25- XXX	UF 5

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.6.2 Fiberfix (type FFD)



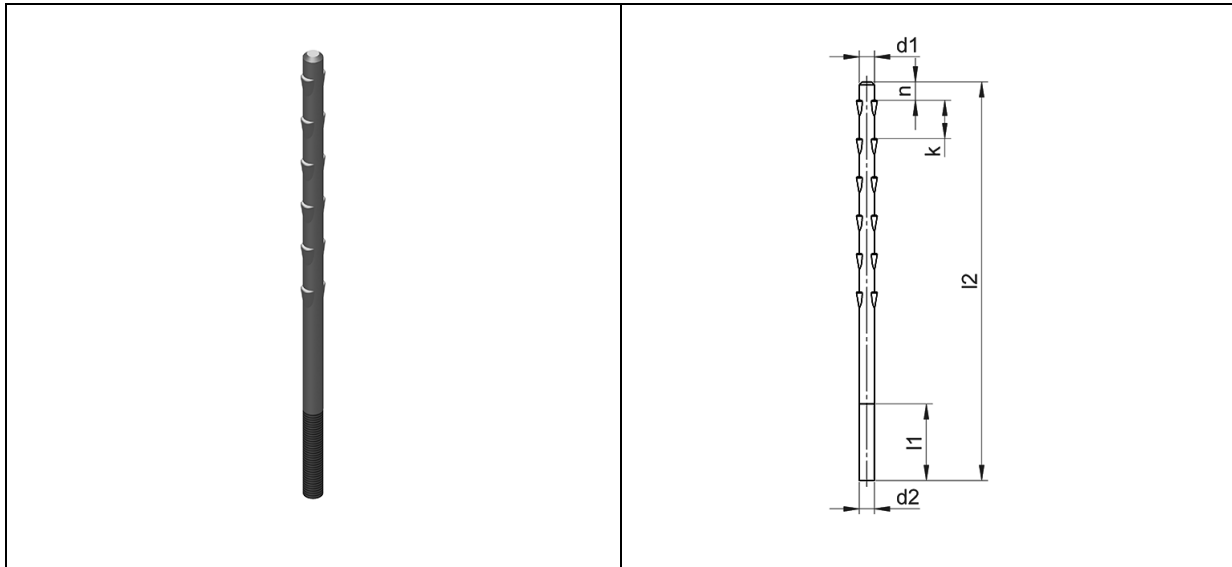
Dimensions				Material (item number)			Ceramic ferrule
d ₁	l ₂	k	n	1.4301	1.4828	1.4841	
5	50-400	12,5	6	50-15-XXX-FFD	50-65-XXX-FFD	50-25-XXX-FFD	UF 5

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.6.3 Fiberfix (type FFT)



Fiberfix – with thread (for the use with internally threaded stud (type ID))

Dimensions						Material (item number)		
d ₁	l ₂	k	n	d ₂	l ₁	1.4301	1.4828	1.4841
5	50-400	12,5	6	M5	10-30	50-15- XXX -FFT- XX	50-65- XXX -FFT- XX	50-25- XXX -FFT- XX

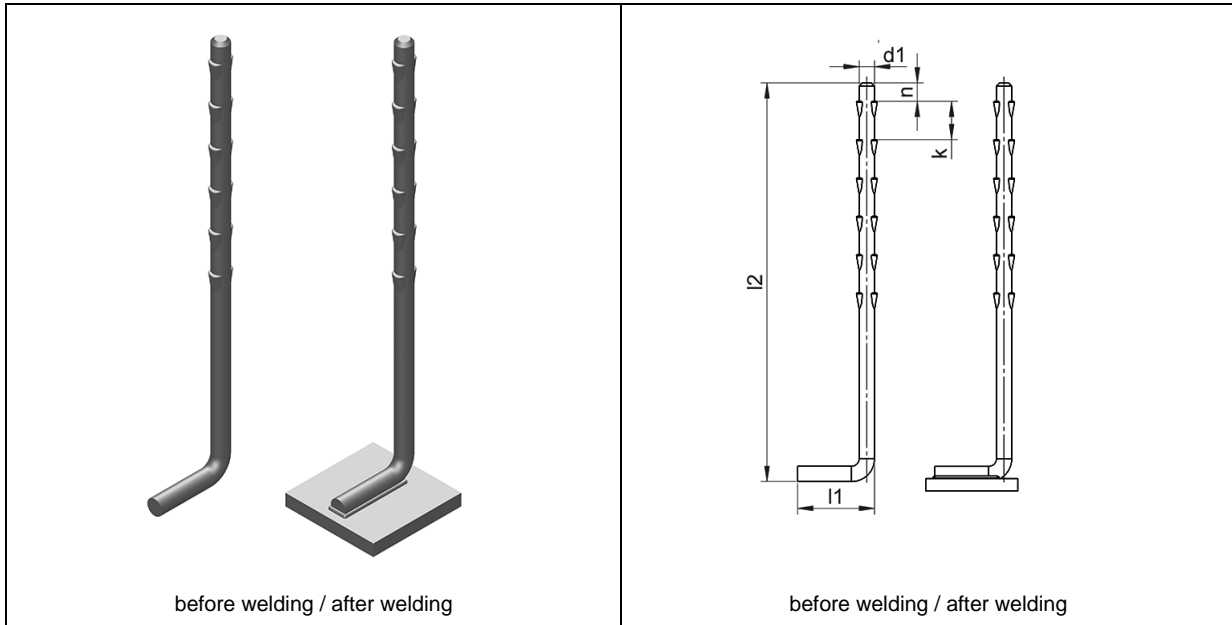
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **XX** by the respective thread length l_1 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

Internally threaded studs (type ID), see chapter 1.10.2.

1.6.4 Fiberfix (type FFH) (for manual welding)



Fiberfix - angled (for manual welding)

Dimensions					Material (item number)		
d ₁	l ₂	k	n	l ₁	1.4301	1.4828	1.4841
5	50-400	12,5	6	15-30	50-15-XXX-FFH-XX	50-65-XXX-FFH-XX	50-25-XXX-FFH-XX

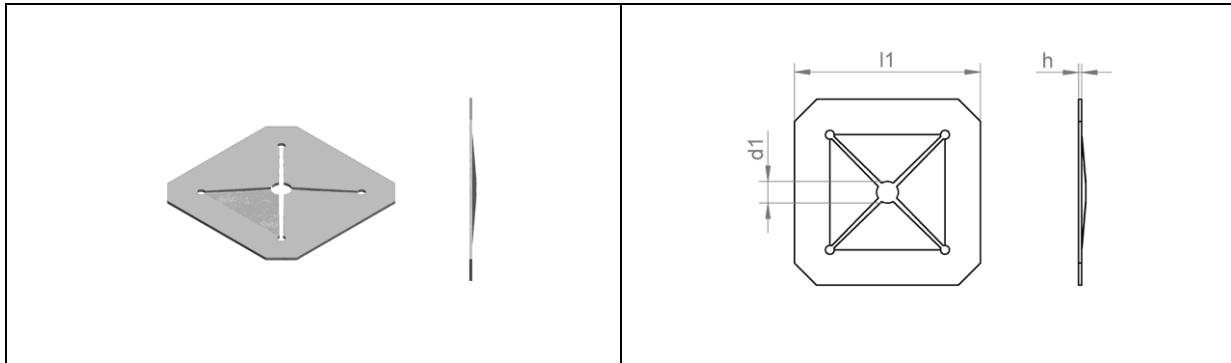
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **XX** by the respective angled length l_1 .

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

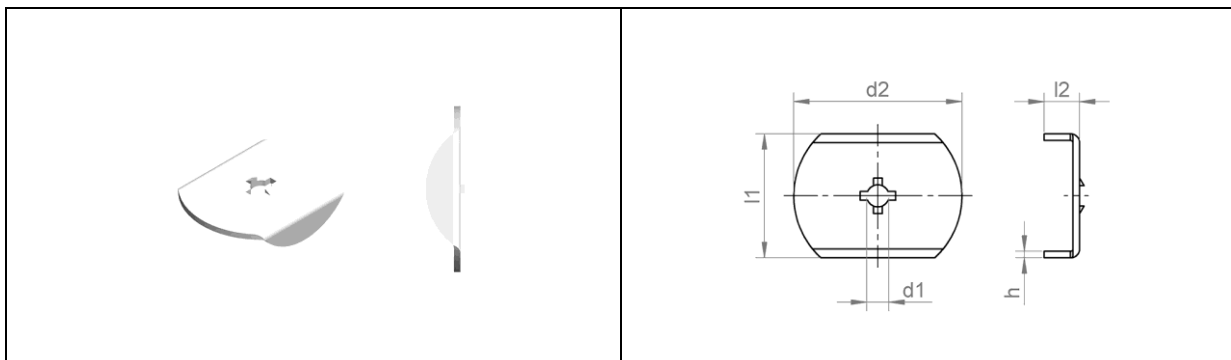
1.6.5 Mounting clip for fiberfix (type MTC)



Dimensions			Material (item number)	
d ₁	l ₁	h	Steel zinc-plated	1.4310
6	42	0,4	MTC-045-000	MTC-045-304

Not listed dimensions and materials available upon request.

1.6.6 Rotary clip for fiberfix (type D38)

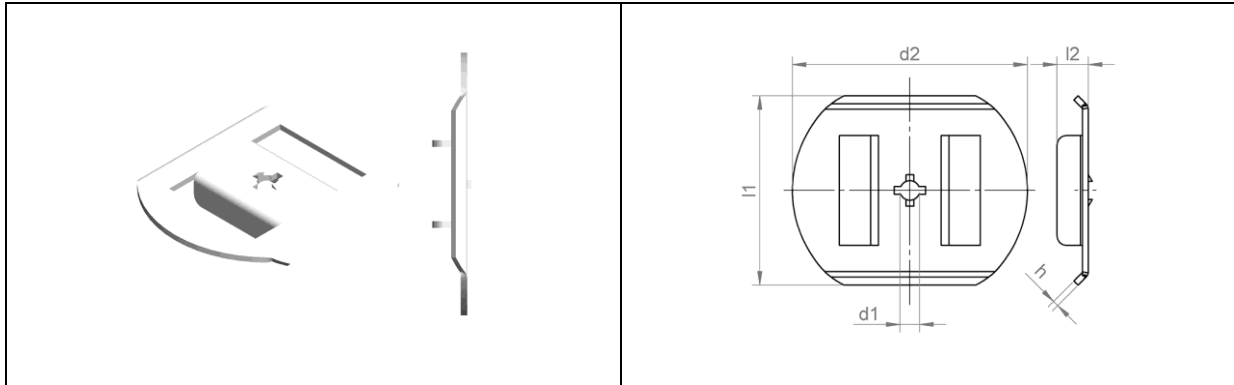


Dimensions					Material (item number)		
d ₁	d ₂	l ₁	l ₂	h	1.4301	1.4828	1.4841
5	38	28	8	1,5	50-10-038	50-60-038	50-20-038

Not listed dimensions and materials available upon request.



1.6.7 Rotary clip for fiberfix (type D60)

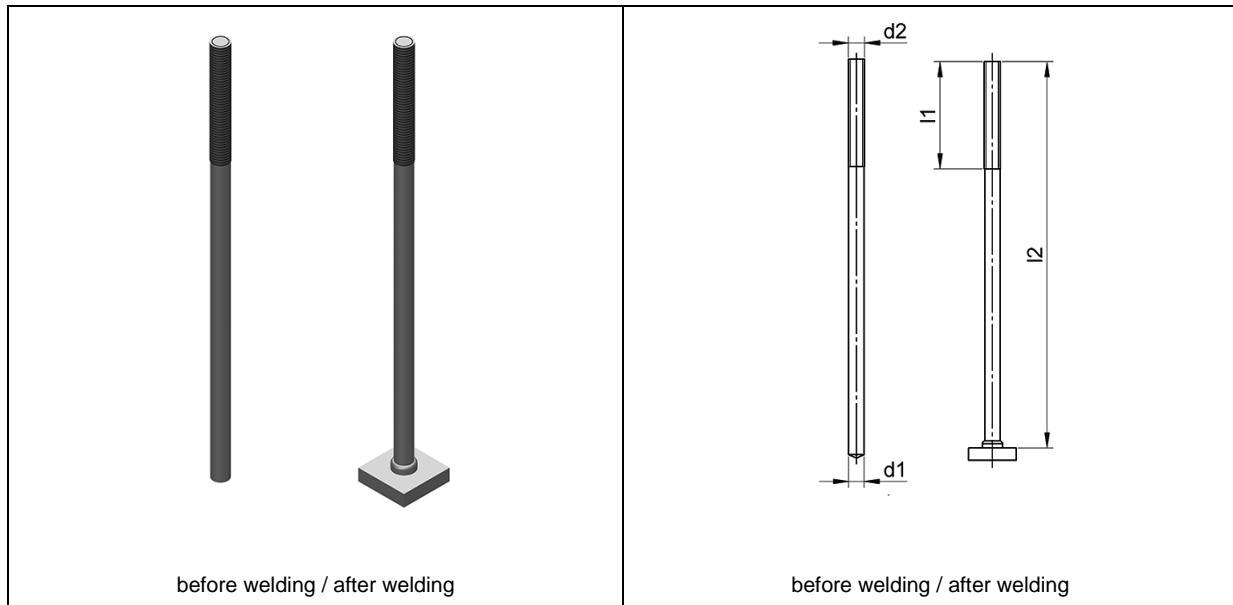


Dimensions					Material (item number)		
d ₁	d ₂	l ₁	l ₂	h	1.4301	1.4828	1.4841
5	60	48	8	1,5	50-10-060	50-60-060	50-20-060

Not listed dimensions and materials available upon request.

1.7 Threaded studs, clips, disks, nut, threaded plate

1.7.1 Threaded stud (type DRS)



Dimensions				Material (item number)			Ceramic ferrule
d ₁	l ₂	d ₂	l ₁	1.4301	1.4828	1.4841	
5	50-400	M5	10-50	52-15-XXX-XX	52-65-XXX-XX	52-25-XXX-XX	UF 5
6	50-400	M6	10-50	52-16-XXX-XX	52-66-XXX-XX	52-26-XXX-XX	UF 6

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **XX** by the respective thread length l_1 .

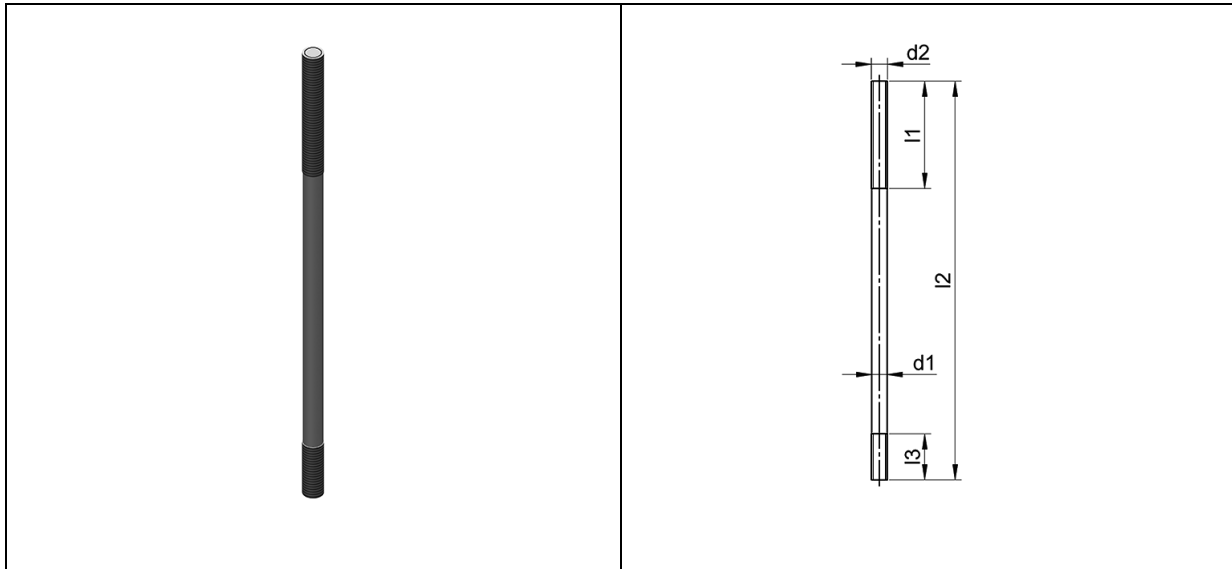
Threaded studs (type DRS) M5 and M6 do not have a pressed-in aluminium ball at the welding tip. Threaded studs (type DRS) M8 and larger have a pressed-in aluminium ball at the welding tip.

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.



1.7.2 Threaded stud (type DRT)



Threaded stud – both sides threaded (for the use with internally threaded stud (type ID))

Dimensions					Material (item number)		
d ₂	d ₁	l ₂	l ₁	l ₃	1.4301	1.4828	1.4841
M5	5	50-400	10-50	10-50	52-15-XXX-XX-DRT-YY	52-65-XXX-XX-DRT-YY	52-25-XXX-XX-DRT-YY
M6	6	50-400	10-50	10-50	52-16-XXX-XX-DRT-YY	52-66-XXX-XX-DRT-YY	52-26-XXX-XX-DRT-YY

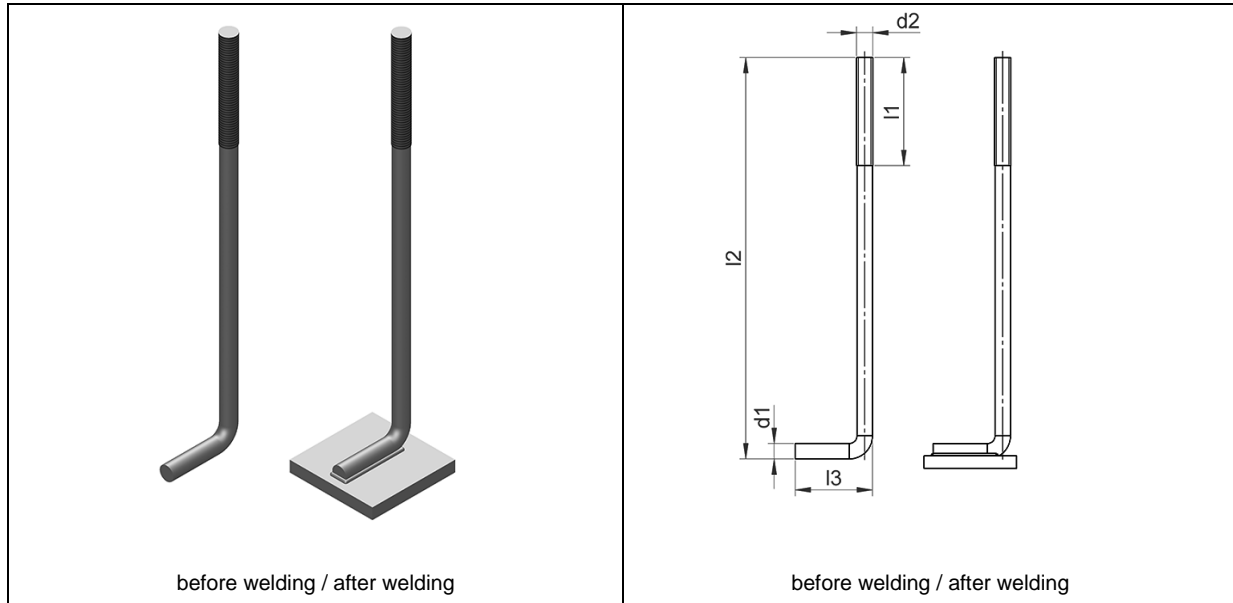
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) as well as **XX** by the respective thread length l_1 and **YY** by the respective thread length l_3 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

Internally threaded studs (type ID), see chapter 1.10.2.

1.7.3 Threaded stud (type DRH) (for manual welding)



Threaded stud - angled (for manual welding)

Dimensions					Material (item number)		
d ₁	l ₂	d ₂	l ₁	l ₃	1.4301	1.4828	1.4841
5	50-400	M5	10-50	15-30	52-15-XXX-XX-DRH-YY	52-65-XXX-XX-DRH-YY	52-25-XXX-XX-DRH-YY
6	50-400	M6	10-50	15-30	52-16-XXX-XX-DRH-YY	52-66-XXX-XX-DRH-YY	52-26-XXX-XX-DRH-YY

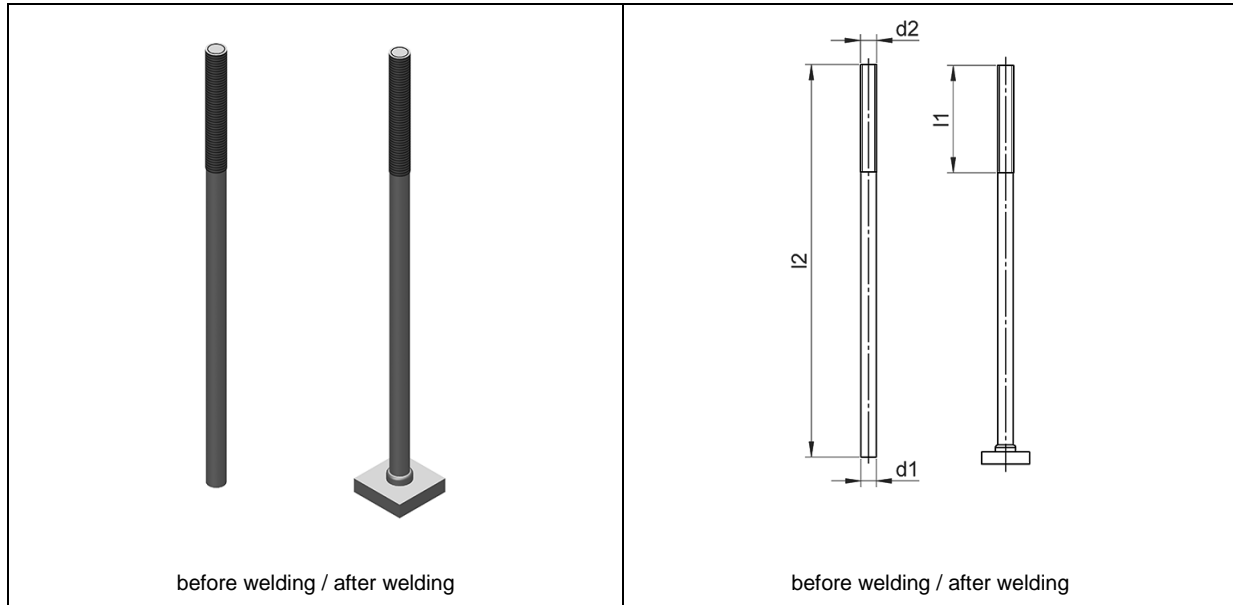
In the item number XXX has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and XX by the respective thread length l_1 and YY by the respective angled length l_3 .

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.7.4 Threaded stud (type DRP) (for manual welding)



Threaded stud – with flat welding tip (for manual welding)

Dimensions				Material (item number)		
d ₁	l ₂	d ₂	l ₁	1.4301	1.4828	1.4841
5	50-400	M5	10-50	52-15-XXX-XX-DRP	52-65-XXX-XX-DRP	52-25-XXX-XX-DRP
6	50-400	M6	10-50	52-16-XXX-XX-DRP	52-66-XXX-XX-DRP	52-26-XXX-XX-DRP

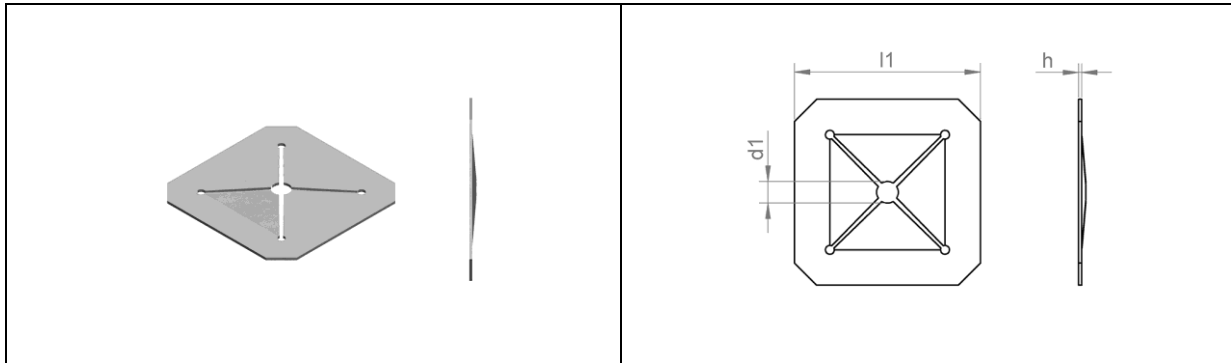
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **XX** by the respective thread length l_1 .

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

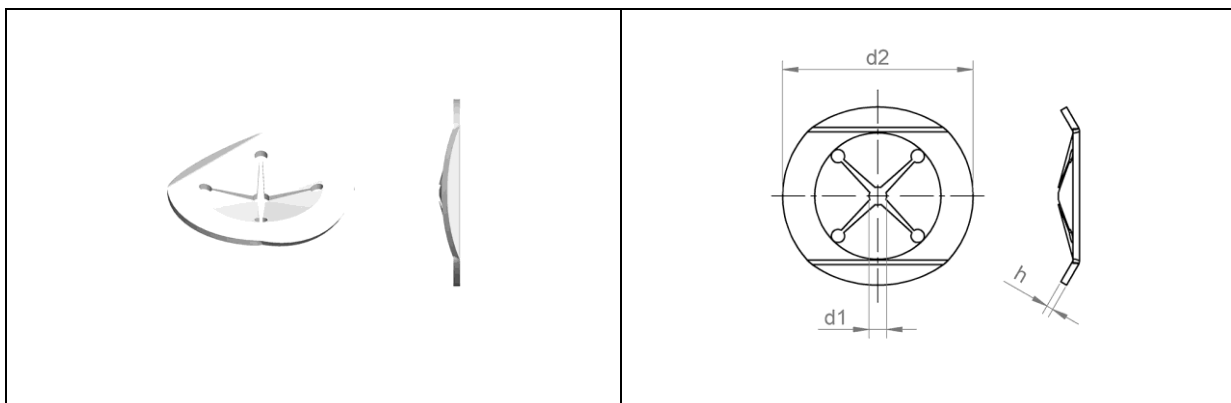
1.7.5 Mounting clip for threaded stud (type MTC)



Dimensions			Material (item number)	
d ₁	l ₁	h	Steel zinc-plated	1.4310
5	42	0,4	MTC-035-000	MTC-035-304
6	42	0,4	MTC-045-000	MTC-045-304

Not listed dimensions and materials available upon request.

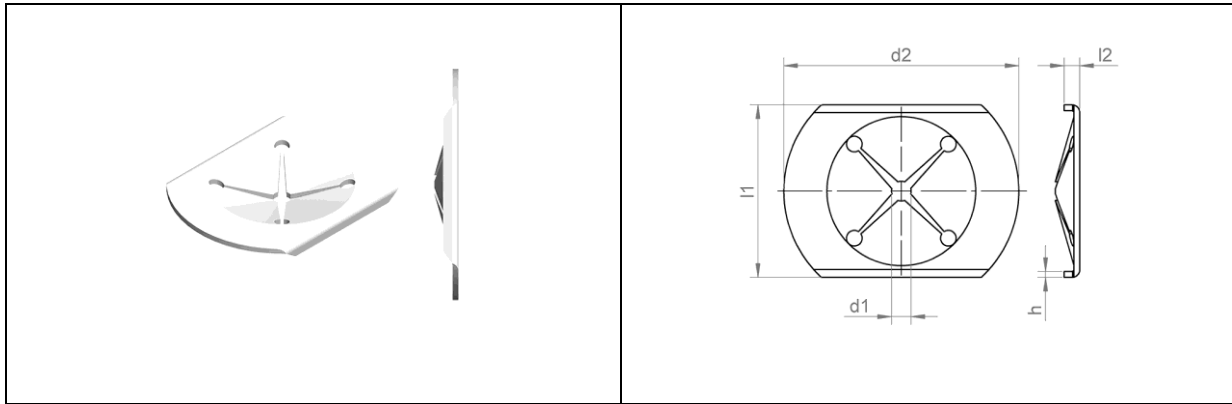
1.7.6 Clip for threaded stud (type POC)



Dimensions			Material (item number)		
d ₁	d ₂	h	1.4301	1.4828	1.4841
5	40	0,8	POC.5-080-304	POC.5-080-309	POC.5-080-310
6	40	0,8	POC.6-080-304	POC.6-080-309	POC.6-080-310

Not listed dimensions and materials available upon request.

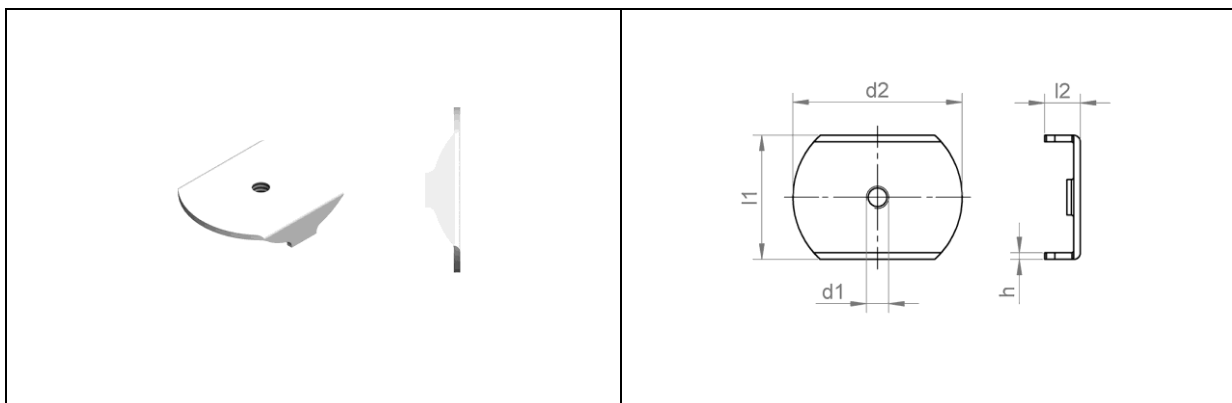
1.7.7 Clip for threaded stud (type LPC)



Dimensions					Material (item number)		
d ₁	d ₂	l ₁	l ₂	h	1.4301	1.4828	1.4841
5	60	44	4	0,8	LPC.5-100-304	LPC.5-100-309	LPC.5-100-310
6	60	44	4	0,8	LPC.6-100-304	LPC.6-100-309	LPC.6-100-310

Not listed dimensions and materials available upon request.

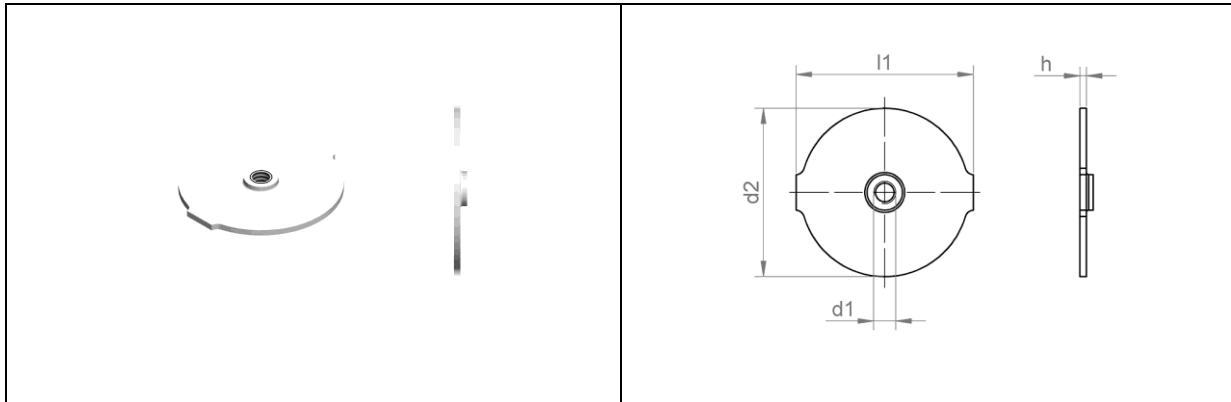
1.7.8 Rotary clip with thread for threaded stud (type D38-M)



Dimensions					Material (item number)		
d ₁	d ₂	l ₁	l ₂	h	1.4301	1.4828	1.4841
M5	38	28	8	1,5	50-10-138	50-60-138	50-20-138
M6	38	28	8	1,5	50-10-638	50-60-638	50-20-638

Not listed dimensions and materials available upon request.

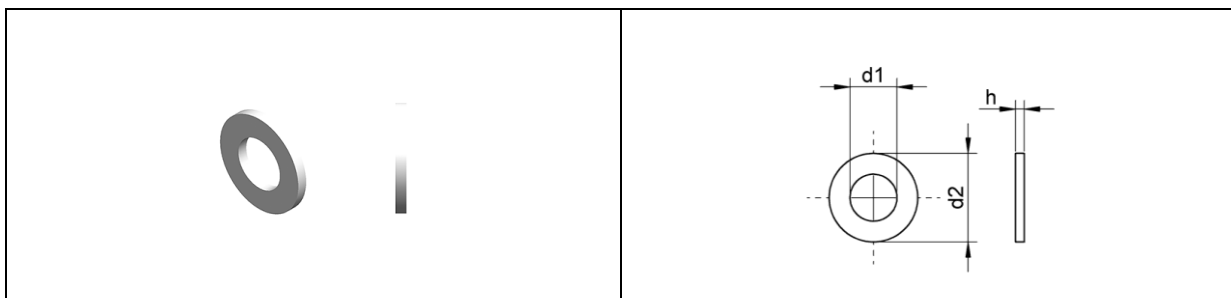
1.7.9 Rotary clip with thread for threaded stud (type D38-M-NA)



Dimensions				Material (item number)		
d ₁	d ₂	l ₁	h	1.4301	1.4828	1.4841
M5	38	40	1,5	50-10-138-NICHTAUFGE	50-60-138-NICHTAUFGE	50-20-138-NICHTAUFGE
M6	38	40	1,5	50-10-638-NICHTAUFGE	50-60-638-NICHTAUFGE	50-20-638-NICHTAUFGE

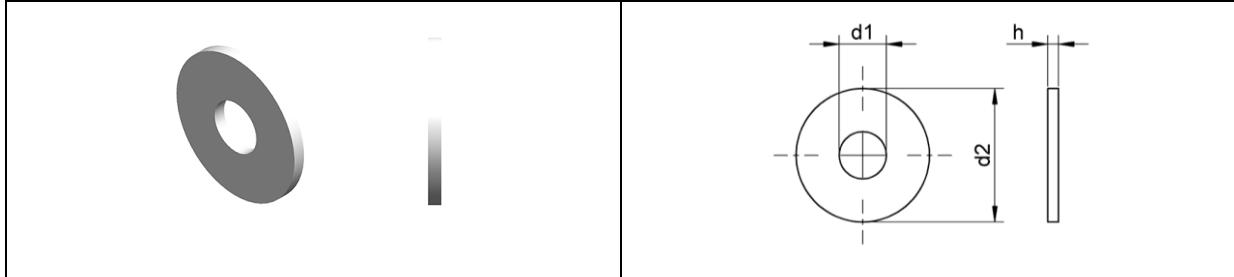
Not listed dimensions and materials available upon request.

1.7.10 Disk for threaded stud (type DIN 125)



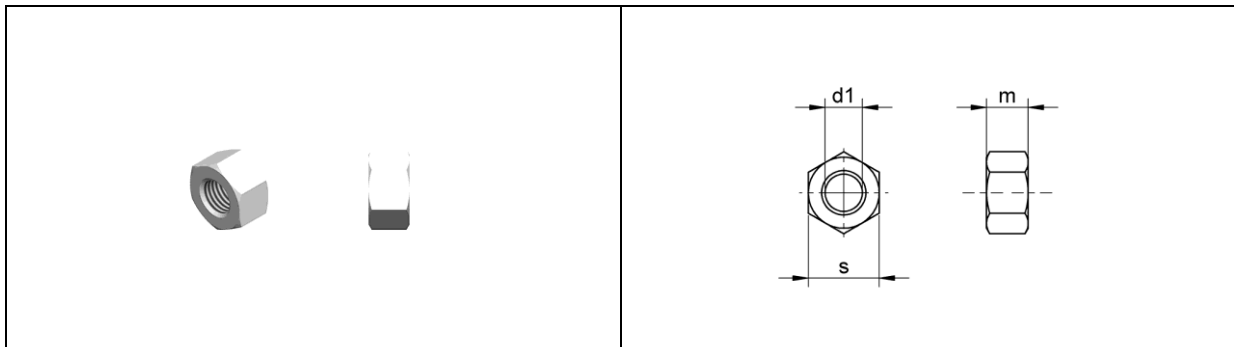
Dimensions			Material (item number)		
d ₁	d ₂	h	A2-70	1.4828	1.4841
5,3	10	1	DIN125-A2-5,3	DIN125-4828-5,3	DIN125-4841-5,3
6,4	12	1,6	DIN125-A2-6,4	DIN125-4828-6,4	DIN125-4841-6,4

1.7.11 Disk for threaded stud (type DIN 9021)



Dimensions			Material (item number)		
d ₁	d ₂	h	A2-70	1.4828	1.4841
5,3	15	1,2	DIN9021-A2-5,3	DIN9021-4828-5,3	DIN9021-4841-5,3
6,4	18	1,6	DIN9021-A2-6,4	DIN9021-4828-6,4	DIN9021-4841-6,4

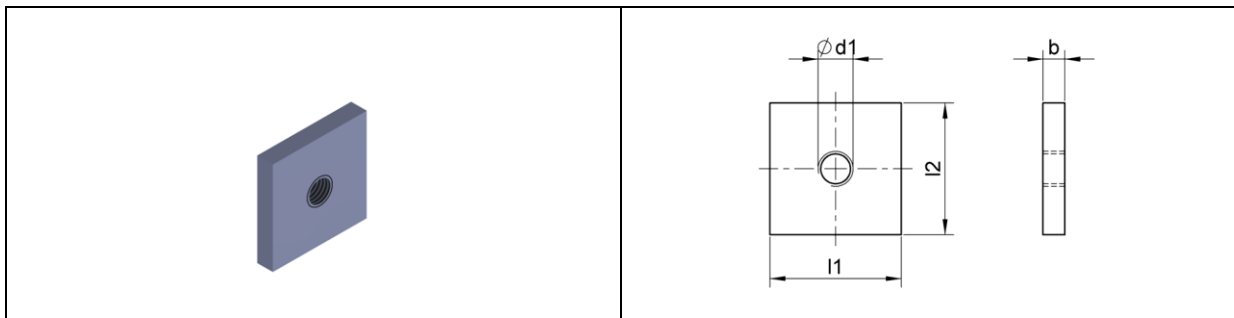
1.7.12 Nut for threaded stud (type DIN 934)



Dimensions			Material (item number)		
d ₁	s	m	A2-70	1.4841	1.4845
M5	8	4	DIN934-A2-M5	DIN934-4841-M5	DIN934-4845-M5
M6	10	5	DIN934-A2-M6	DIN934-4841-M6	DIN934-4845-M6

Not listed dimensions and materials available upon request.

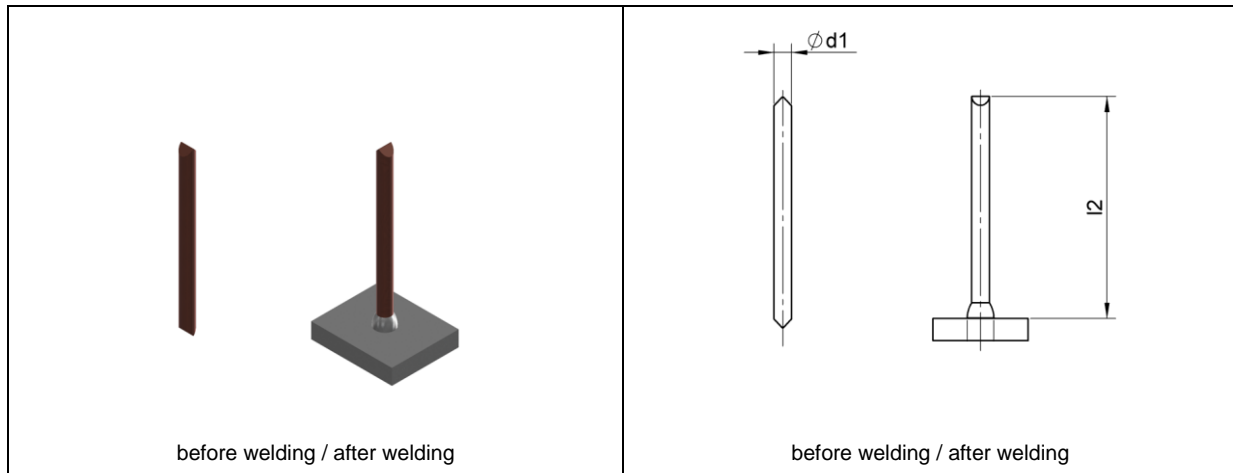
1.7.13 Threaded plate



Available dimensions and materials available upon request.

1.8 Insulation pins and clip

1.8.1 Insulation pin (type ISMS)



Insulation pin - two-sided with chisel tip

Dimensions		Material (item number)					[Ceramic ferrule ¹]
d ₁	l ₂	Steel 4.8 copper-plated	1.4301	1.4541	1.5415 (16Mo3)	1.4841	
3	20-450	66-03-XXX-MS	67-03-XXX-MS	70-03-XXX-MS	68-03-XXX-MS	69-03-XXX-MS	[UF 4 ¹ / K 5 ¹]
4	60-450	66-04-XXX-MS	-	-	-	-	[UF 4 ¹ / K 5 ¹]
5	60-120	66-05-XXX-MS	-	-	-	-	[UF 5 ¹ / K 5 ¹]

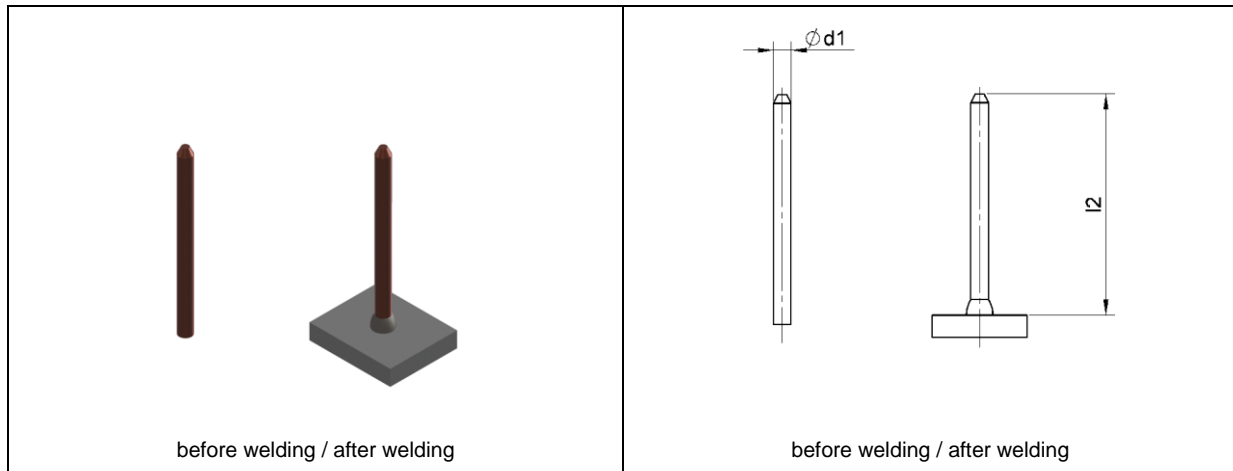
¹Insulation pins are generally welded without ceramic ferrules. Ceramic ferrules are only used for special applications. If ceramic ferrules shall be used, either type UF or type K can be chosen.

In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.8.2 Insulation pin (type ISA)



Insulation pin - one-sided with grinded tip

Dimensions		Material (item number)					[Ceramic ferrule ¹]
d ₁	l ₂	Steel 4.8 copper-plated	1.4301	1.4541	1.5415 (16Mo3)	1.4841	
3	35-450	66-03-XXX	67-03-XXX	70-03-XXX	68-03-XXX	69-03-XXX	[UF 4 ¹ / K 5 ¹]
4	60-450	66-04-XXX	67-04-XXX	70-04-XXX	68-04-XXX	69-04-XXX	[UF 4 ¹ / K 5 ¹]
5	60-450	66-05-XXX	67-05-XXX	70-05-XXX	68-05-XXX	69-05-XXX	[UF 5 ¹ / K 5 ¹]

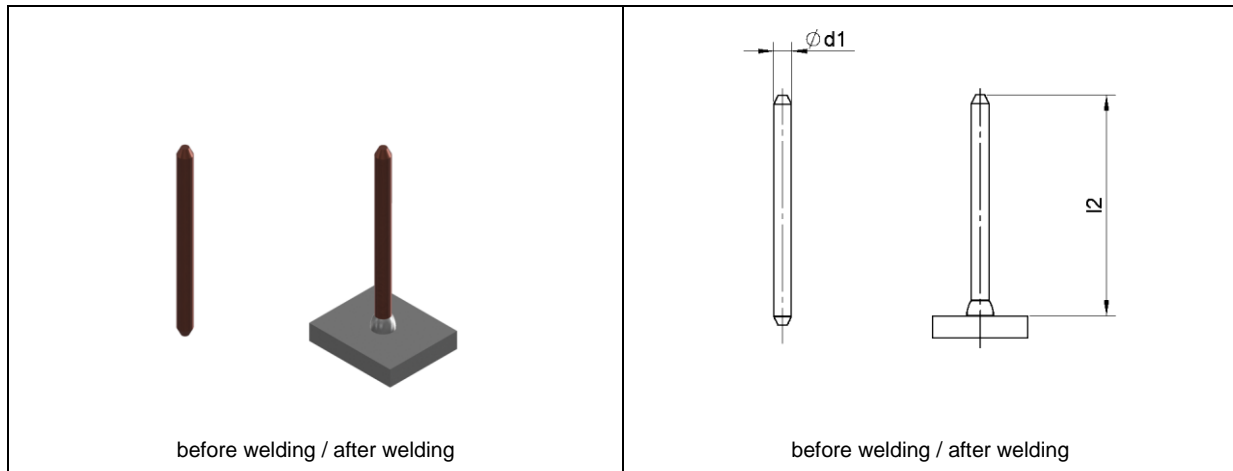
¹Insulation pins are generally welded without ceramic ferrules. Ceramic ferrules are only used for special applications. If ceramic ferrules shall be used, either type UF or type K can be chosen.

In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.8.3 Insulation pin (type ISB)



Insulation pin - two-sided with grinded tip

Dimensions		Material (item number)					[Ceramic ferrule ¹]
d ₁	l ₂	Steel 4.8 copper-plated	1.4301	1.4541	1.5415 (16Mo3)	1.4841	
3	50-450	66-03-XXX-BS	67-03-XXX-BS	70-03-XXX-BS	68-03-XXX-BS	69-03-XXX-BS	[UF 4 ¹ / K 5 ¹]
4	50-450	66-04-XXX-BS	67-04-XXX-BS	70-04-XXX-BS	68-04-XXX-BS	69-04-XXX-BS	[UF 4 ¹ / K 5 ¹]
5	50-450	66-05-XXX-BS	67-05-XXX-BS	70-05-XXX-BS	68-05-XXX-BS	69-05-XXX-BS	[UF 5 ¹ / K 5 ¹]

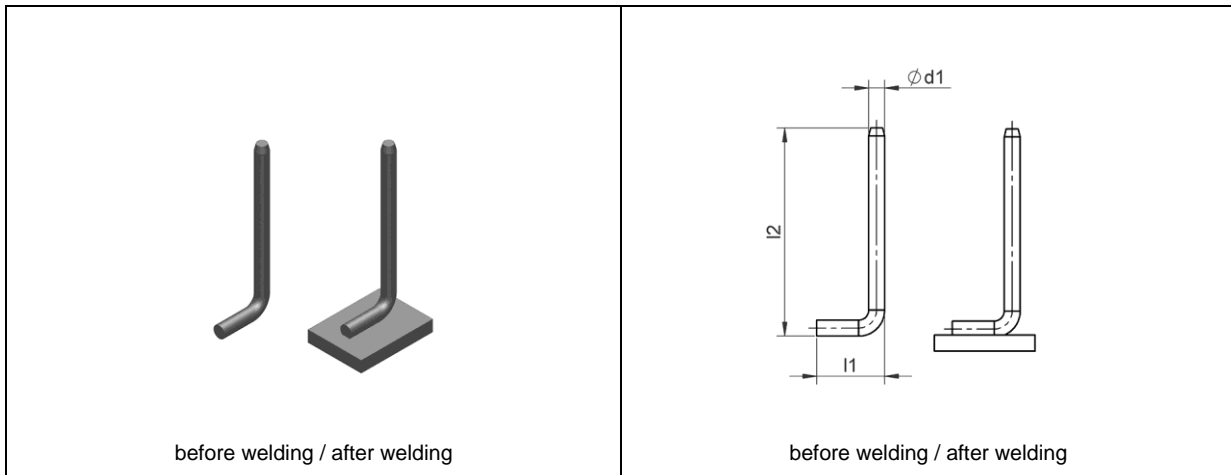
¹Insulation pins are generally welded without ceramic ferrules. Ceramic ferrules are only used for special applications. If ceramic ferrules shall be used, either type UF or type K can be chosen.

In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.8.4 Insulation pin (type ISH) (for manual welding)



Insulation pin - angled (for manual welding)

Dimensions			Material (item number)				
d ₁	l ₂	l ₁	Steel 4.8 copper-plated	1.4301	1.4541	1.5415 (16Mo3)	1.4841
3	upon request	upon request	66-03-XXX-ISH-XX	67-03-XXX-ISH-XX	70-03-XXX-ISH-XX	68-03-XXX-ISH-XX	69-03-XXX-ISH-XX
4	upon request	upon request	66-04-XXX-ISH-XX	67-04-XXX-ISH-XX	70-04-XXX-ISH-XX	68-04-XXX-ISH-XX	69-04-XXX-ISH-XX
5	upon request	upon request	66-05-XXX-ISH-XX	67-05-XXX-ISH-XX	70-05-XXX-ISH-XX	68-05-XXX-ISH-XX	69-05-XXX-ISH-XX

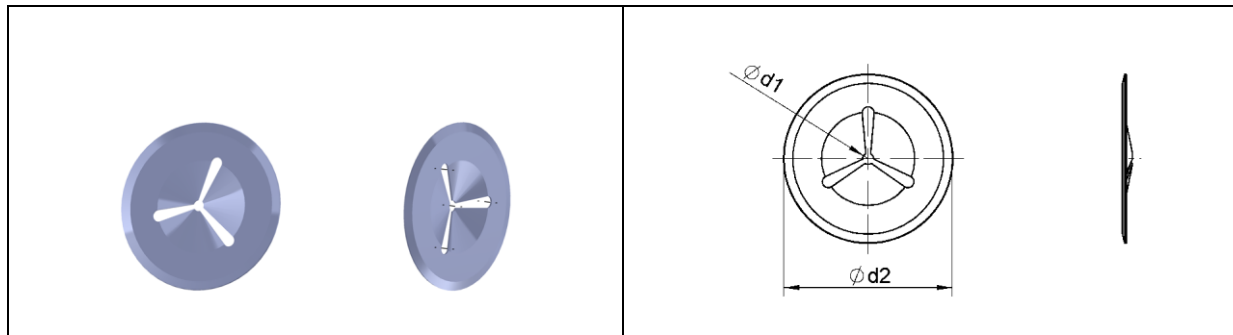
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm) and **XX** by the respective angled length l_1 .

Deviant from welding elements for drawn arc stud welding for welding elements for manual welding the original length, i.e. the length before welding, is always stated as the nominal length l_2 .

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.8.5 Clip for insulation pin (type R)

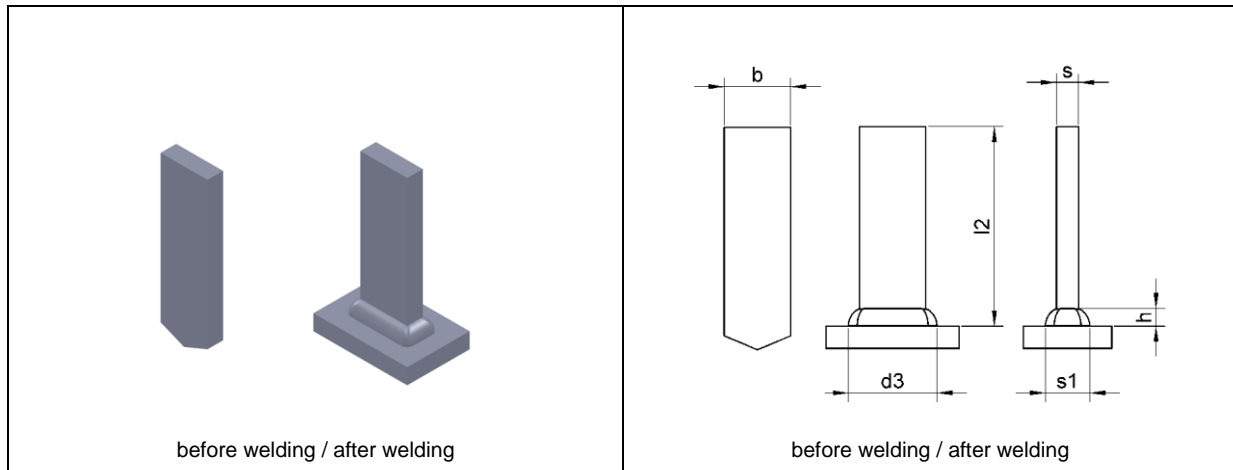


Dimensions		Material (item number)	
d ₁	d ₂	Steel zinc-plated	1.4310
3	38	49-13-003	49-23-003
4	38	49-14-004	49-24-004
5	38	49-15-005	49-25-005
3	60	49-13-003-ST2K70-D60	49-23-003-4301-D60
4	60	49-14-004-ST2K70-D60	49-24-004-4301-D60
5	60	49-15-005-ST2K70-D60	49-25-005-4301-D60

Not listed dimensions and materials available upon request.

1.9 Rectangular studs

1.9.1 Rectangular stud (type A)



Dimensions			Material (item number)				Ceramic ferrule
b	s	l ₂	Steel 4.8	1.4301	1.4828	1.4841	
15	3	20-100	77-15-3-XXX-OK	77-2-15-3-XXX-OK	77-5-15-3-XXX-OK	77-3-15-3-XXX-OK	KF 15x3
15	5	20-100	77-15-5-XXX-OK	77-2-15-5-XXX-OK	77-5-15-5-XXX-OK	77-3-15-5-XXX-OK	KF 15x5
25	3	25-100	77-25-3-XXX-OK	77-2-25-3-XXX-OK	77-5-25-3-XXX-OK	77-3-25-3-XXX-OK	KF 25x3
25	5	25-100	77-25-5-XXX-OK	77-2-25-5-XXX-OK	77-5-25-5-XXX-OK	77-3-25-5-XXX-OK	KF 25x5

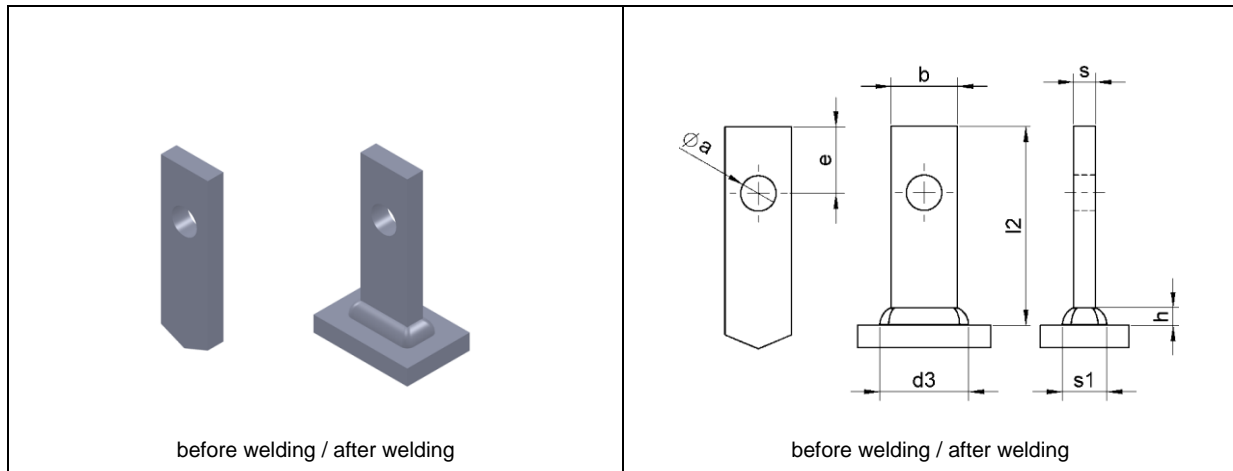
Rectangular studs (type A) standardly do not have a pressed-in aluminium ball, but can be produced with aluminium ball on demand.

In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.9.2 Rectangular stud (type B)



Dimensions					Material (item number)				Ceramic ferrule
b	s	l ₂	a	e	Steel 4.8	1.4301	1.4828	1.4841	
15	3	20-100	6	15 (10 ¹)	77-15-3-XXX-a-e-OK	77-2-15-3-XXX-a-e-OK	77-5-15-3-XXX-a-e-OK	77-3-15-3-XXX-a-e-OK	KF 15x3
15	5	20-100	8	15 (10 ¹)	77-15-5-XXX-a-e-OK	77-2-15-5-XXX-a-e-OK	77-5-15-5-XXX-a-e-OK	77-3-15-5-XXX-a-e-OK	KF 15x5
25	3	25-100	8	15	77-25-3-XXX-a-e-OK	77-2-25-3-XXX-a-e-OK	77-5-25-3-XXX-a-e-OK	77-3-25-3-XXX-a-e-OK	KF 25x3
25	5	25-100	8	15	77-25-5-XXX-a-e-OK	77-2-25-5-XXX-a-e-OK	77-5-25-5-XXX-a-e-OK	77-3-25-5-XXX-a-e-OK	KF 25x5

¹for l₂ < 25 mm

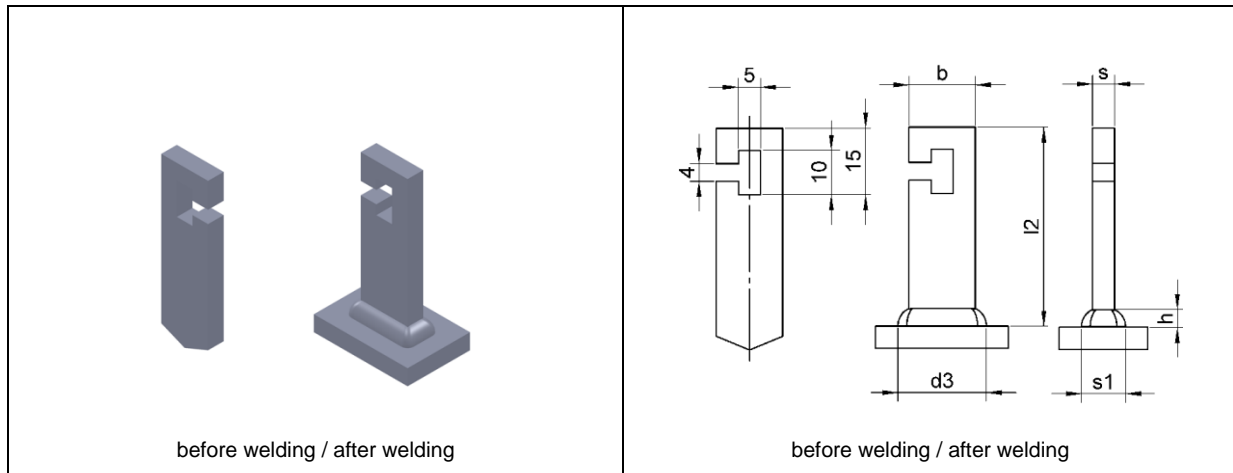
Rectangular studs (type B) standardly do not have a pressed-in aluminium ball, but can be produced with aluminium ball on demand.

In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.9.3 Rectangular stud (type C)



Dimensions			Material (item number)				Ceramic ferrule
b	s	l ₂	Steel 4.8	1.4301	1.4828	1.4841	
15	3	20-100	77-15-3-XXX-C-OK	77-2-15-3-XXX-C-OK	77-5-15-3-XXX-C-OK	77-3-15-3-XXX-C-OK	KF 15x3
15	5	20-100	77-15-5-XXX-C-OK	77-2-15-5-XXX-C-OK	77-5-15-5-XXX-C-OK	77-3-15-5-XXX-C-OK	KF 15x5
25	3	25-100	77-25-3-XXX-C-OK	77-2-25-3-XXX-C-OK	77-5-25-3-XXX-C-OK	77-3-25-3-XXX-C-OK	KF 25x3
25	5	25-100	77-25-5-XXX-C-OK	77-2-25-5-XXX-C-OK	77-5-25-5-XXX-C-OK	77-3-25-5-XXX-C-OK	KF 25x5

Rectangular studs (type C) standardly do not have a pressed-in aluminium ball, but can be produced with aluminium ball on demand.

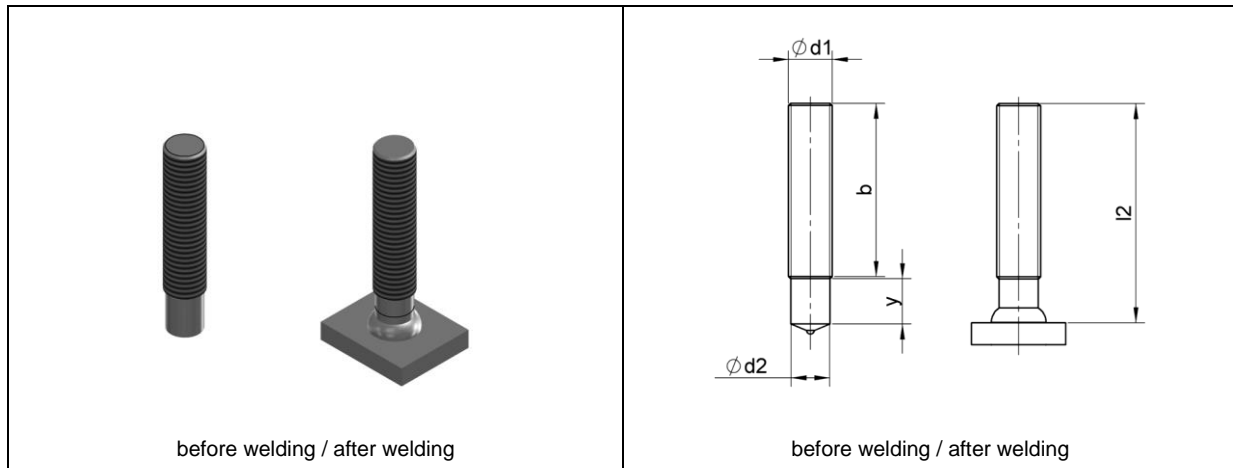
In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.10 Threaded stud, internally threaded stud, non-threaded stud acc. to DIN EN ISO 13918

1.10.1 Threaded stud with partial thread (type PD acc. to DIN EN ISO 13918)



The threaded stud type PD has a partial thread. The diameter of the unthreaded stud section on the welding tip corresponds to the pitch diameter of the thread. Thus the diameter of the weld-fillet is approximately 3-4 mm larger than the external diameter of the thread.

Dimensions					Material (item number)						Ceramic ferrule
d_1	l_2	y -0,2P ¹	b	d_2 -0,1/0,1	Steel 4.8	1.4301	1.4571	1.4541	1.4828	1.4841	
M8	20 ≤ l_2 < 50 50 ≤ l_2 < 160 l_2 ≥ 160	9 - -	- 40 40	7,1	46-08- XXX	47-08- XXX	48-08- XXX	48-08- XXX- 4541	48-08- XXX- 4828	48-08- XXX- 4841	PF 8
M10	20 ≤ l_2 < 50 50 ≤ l_2 < 140 140 ≤ l_2 ≤ 160	9,5 - -	- 40 80	8,95	46-10- XXX	47-10- XXX	48-10- XXX	48-10- XXX- 4541	48-10- XXX- 4828	48-10- XXX- 4841	PF 10
M12	25 ≤ l_2 < 50 50 ≤ l_2 < 140 140 ≤ l_2 ≤ 160	11,5 - -	- 40 80	10,8	46-12- XXX	47-12- XXX	48-12- XXX	48-12- XXX- 4541	48-12- XXX- 4828	48-12- XXX- 4841	PF 12
M16	30 ≤ l_2 < 55 55 ≤ l_2 < 70 70 ≤ l_2 < 100 100 ≤ l_2 ≤ 160	13,5 - - -	- 40 50 80	14,6	46-16- XXX	47-16- XXX	48-16- XXX	48-16- XXX- 4541	48-16- XXX- 4828	48-16- XXX- 4841	PF 16

¹P = thread pitch acc. to DIN 13-1

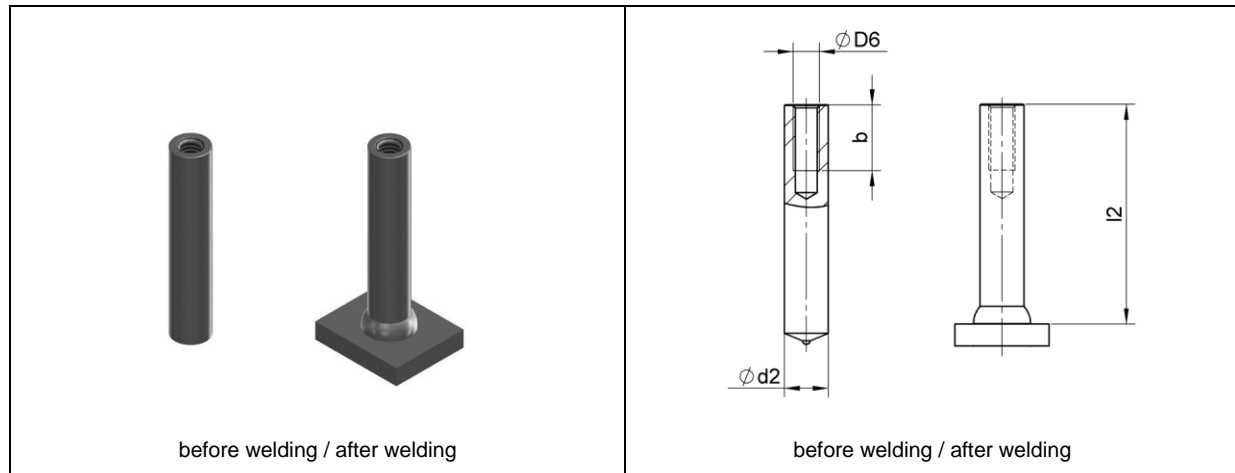
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Other stud types can be found in our catalogue welding studs for drawn arc stud welding.

Not listed dimensions and materials available upon request.

1.10.2 Internally threaded stud (type ID acc. to DIN EN ISO 13918)



Dimensions				Material (item number)						Ceramic ferrule
D ₆	b +2P ¹	d ₂ -0,1/0,1	l ₂	Steel 4.8	1.4301	1.4571	1.4541	1.4828	1.4841	
M5	7	10	15-100	61-10-XXX-M5X7	62-10-XXX-M5X7	62-3-10-XXX-M5X7	62-4-10-XXX-M5X7	62-5-10-XXX-M5X7	62-6-10-XXX-M5X7	UF 10 (KSN-F 10 ²)
M6	9 (7 ²)	10	15-100	61-10-XXX-M6X7 ² 61-10-XXX-M6X9	62-10-XXX-M6X7 ² 62-10-XXX-M6X9	62-3-10-XXX-M6X7 ² 62-3-10-XXX-M6X9	62-4-10-XXX-M6X7 ² 62-4-10-XXX-M6X9	62-5-10-XXX-M6X7 ² 62-5-10-XXX-M6X9	62-6-10-XXX-M6X7 ² 62-6-10-XXX-M6X9	UF 10 (KSN-F 10 ²)
M8	12 (8 ²)	12	15-100	61-12-XXX-M8X8 ² 61-12-XXX-M8X12	62-12-XXX-M8X8 ² 62-12-XXX-M8X12	62-3-12-XXX-M8X8 ² 62-3-12-XXX-M8X12	62-4-12-XXX-M8X8 ² 62-4-12-XXX-M8X12	62-5-12-XXX-M8X8 ² 62-5-12-XXX-M8X12	62-6-12-XXX-M8X8 ² 62-6-12-XXX-M8X12	UF 12 (KSN-F 12 ²)
M8	12 (8 ²)	14,6	15-100	61-14,6-XXX-M8X8 ² 61-14,6-XXX-M8X12	62-14,6-XXX-M8X8 ² 62-14,6-XXX-M8X12	62-3-14,6-XXX-M8X8 ² 62-3-14,6-XXX-M8X12	62-4-14,6-XXX-M8X8 ² 62-4-14,6-XXX-M8X12	62-5-14,6-XXX-M8X8 ² 62-5-14,6-XXX-M8X12	62-6-14,6-XXX-M8X8 ² 62-6-14,6-XXX-M8X12	MF 16
M10	15 (8 ³)	14,6	15-100	61-14,6-XXX-M10X8 ³ 61-14,6-XXX-M10X15	62-14,6-XXX-M10X8 ³ 62-14,6-XXX-M10X15	62-3-14,6-XXX-M10X8 ³ 62-3-14,6-XXX-M10X15	62-4-14,6-XXX-M10X8 ³ 62-4-14,6-XXX-M10X15	62-5-14,6-XXX-M10X8 ³ 62-5-14,6-XXX-M10X15	62-6-14,6-XXX-M10X8 ³ 62-6-14,6-XXX-M10X15	MF 16
M10	15 (8 ³)	16	20-100	61-16-XXX-M10X8 ³ 61-16-XXX-M10X15	62-16-XXX-M10X8 ³ 62-16-XXX-M10X15	62-3-16-XXX-M10X8 ³ 62-3-16-XXX-M10X15	62-4-16-XXX-M10X8 ³ 62-4-16-XXX-M10X15	62-5-16-XXX-M10X8 ³ 62-5-16-XXX-M10X15	62-6-16-XXX-M10X8 ³ 62-6-16-XXX-M10X15	UF 16
M12	18	18,3	25-100	61-18,3-XXX-M12X18	62-18,3-XXX-M12X18	62-3-18,3-XXX-M12X18	62-4-18,3-XXX-M12X18	62-5-18,3-XXX-M12X18	62-6-18,3-XXX-M12X18	MF 20
M16	24	22	40-100	61-22-XXX-M16X24	62-22-XXX-M16X24	62-3-22-XXX-16X24	62-4-22-XXX-16X24	62-5-22-XXX-16X24	62-6-22-XXX-16X24	UF 22

¹P = thread pitch acc. to DIN 13-1

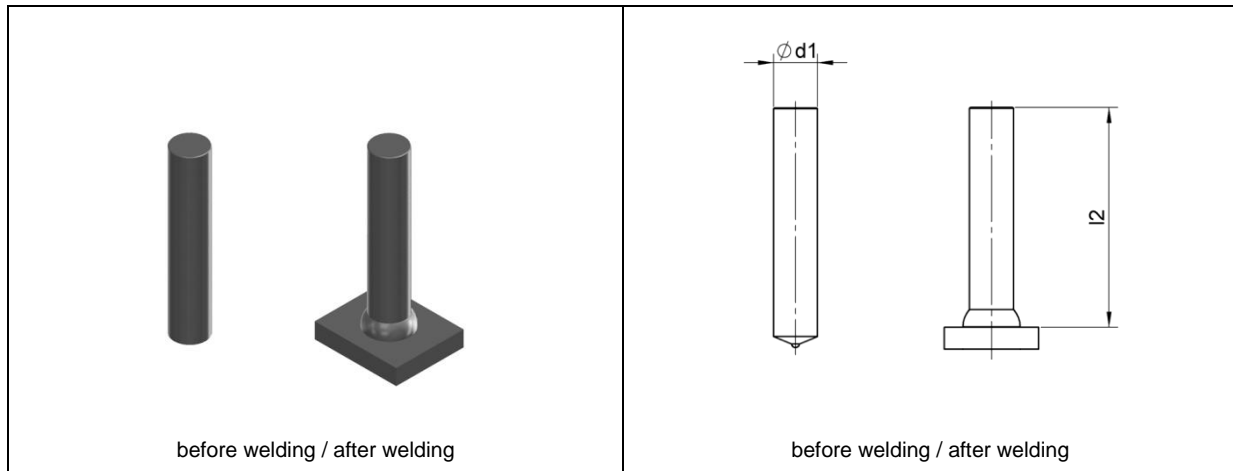
²for l₂ < 20 mm, ³for l₂ < 25 mm

In the item number **XXX** has to be replaced by the respective welding element length l₂ (e.g. 030 for 30 mm).

Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.

1.10.3 Non-threaded stud (type UD acc. to DIN EN ISO 13918)



Dimensions		Material (item number)						Ceramic ferrule
d_1 -0,1/0,1	l_2	Steel 4.8	1.4301	1.4571	1.4541	1.4828	1.4841	
6	15-100	56-06-XXX	57-06-XXX	58-06-XXX	58-4-06-XXX	58-5-06-XXX	58-6-06-XXX	UF 6
8	15-100	56-08-XXX	57-08-XXX	58-08-XXX	58-4-08-XXX	58-5-08-XXX	58-6-08-XXX	UF 8
10	15-100	56-10-XXX	57-10-XXX	58-10-XXX	58-4-10-XXX	58-5-10-XXX	58-6-10-XXX	UF 10 (KSN-F 10 ¹)
12	15-100	56-12-XXX	57-12-XXX	58-12-XXX	58-4-12-XXX	58-5-12-XXX	58-6-12-XXX	UF 12 (KSN-F 12 ¹)
14,6	20-100	56-14,6-XXX	57-14,6-XXX	58-14,6-XXX	58-4-14,6-XXX	58-5-14,6-XXX	58-6-14,6-XXX	MF 16
16	30-100	56-16-XXX	57-16-XXX	58-16-XXX	58-4-16-XXX	58-5-16-XXX	58-6-16-XXX	UF 16
20	40-100	56-20-XXX	57-20-XXX	58-20-XXX	58-4-20-XXX	58-5-20-XXX	58-6-20-XXX	UF 20
22	40-100	56-22-XXX	57-22-XXX	58-22-XXX	58-4-22-XXX	58-5-22-XXX	58-6-22-XXX	UF 22

¹for $l_2 < 20$ mm

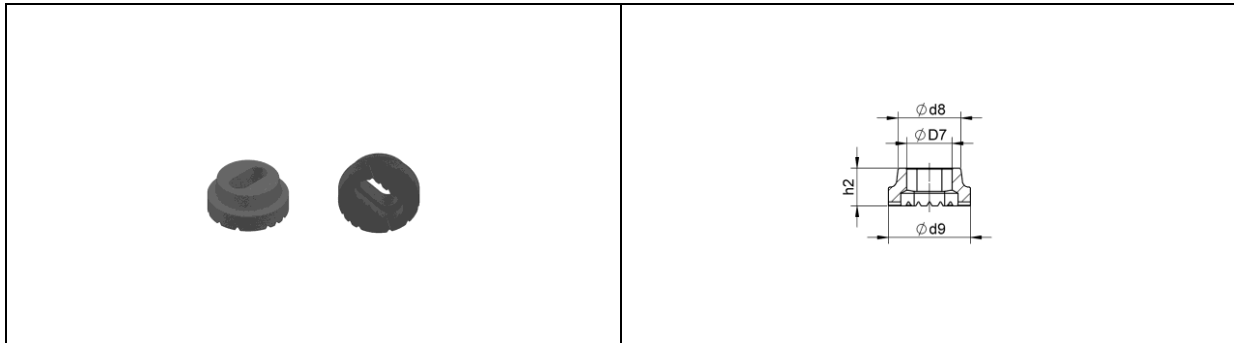
In the item number **XXX** has to be replaced by the respective welding element length l_2 (e.g. 030 for 30 mm).
 Explanations to the used materials can be found in chapter 1.1.

Not listed dimensions and materials available upon request.



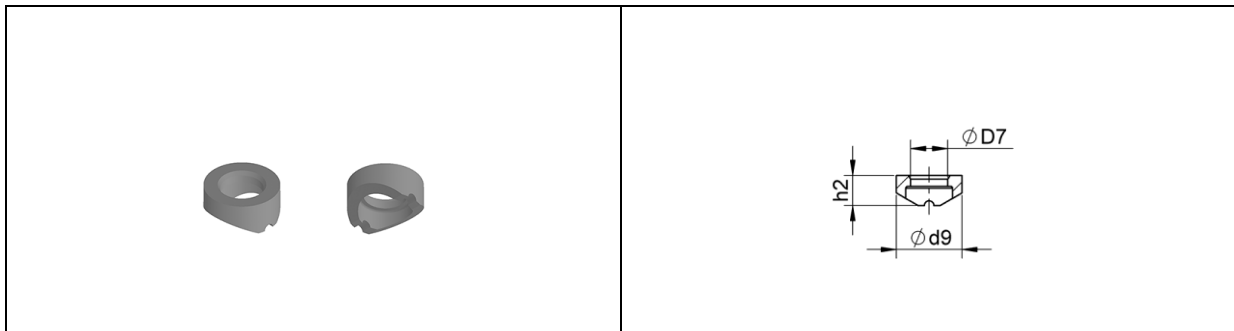
1.11 Ceramic ferrules

1.11.1 Ceramic ferrule for round bar anchor (type KFW)



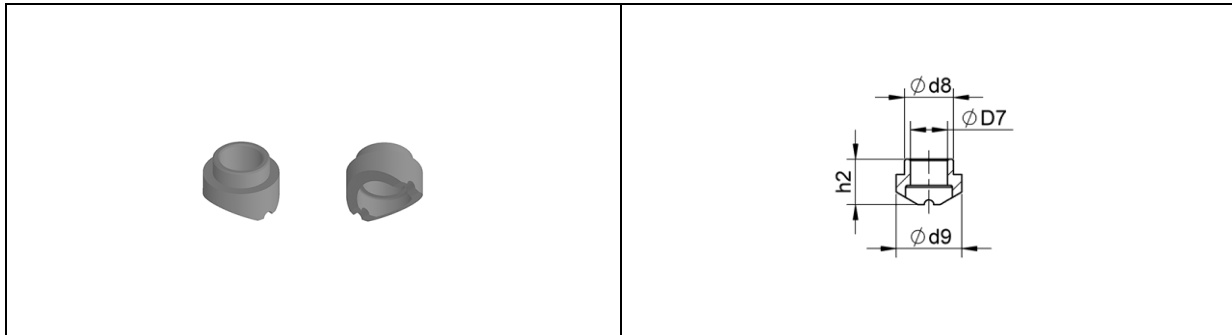
Description	Dimensions				Item number
	D_7 -0,7/+0,7	d_8 -1/+1	d_9 -1/+1	h_2	
KFW 13x6	14,5	20	26,2	≈ 12	75-01-026
KFW 17x8	18,5	22,5	28	≈ 12	75-01-028

1.11.2 Ceramic ferrule for reduced round bar anchors (type UF special, version 1)



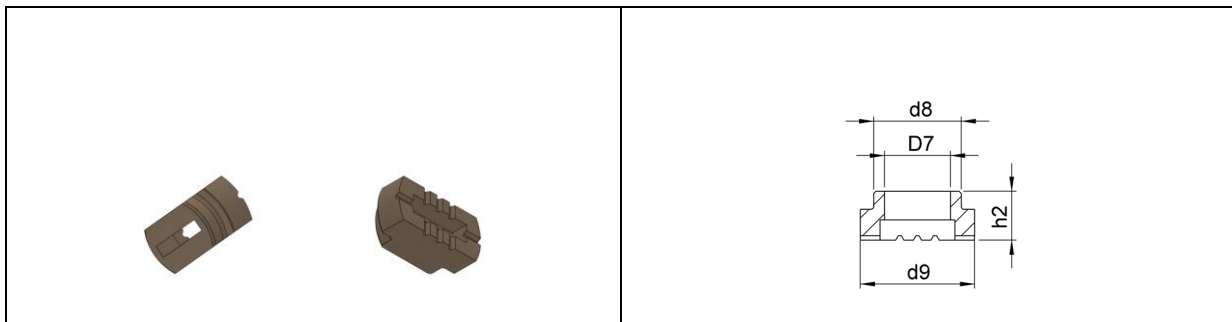
Description	Dimensions			Item number
	D_7 -0/+0,5	d_9 -1/+1	h_2	
UF 8 special 1	8,2	14,6	$\approx 6,9$	75-00-008-ZG1

1.11.3 Ceramic ferrule for reduced round bar anchors (type UF special, version 2)



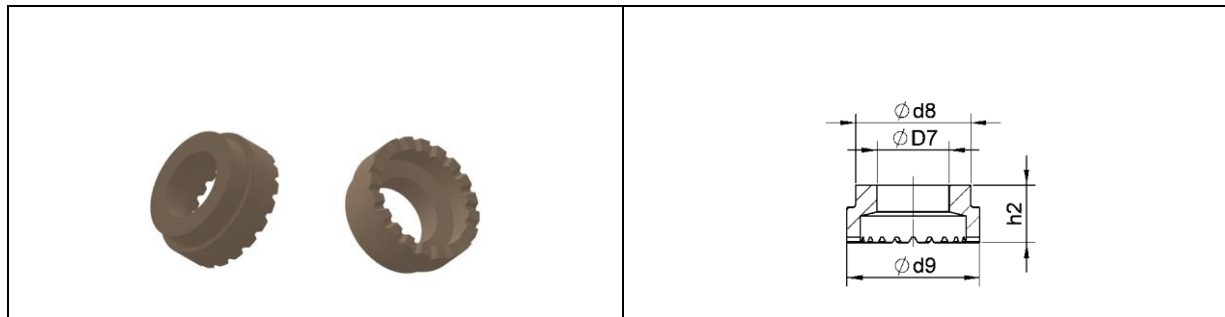
Description	Dimensions				Item number
	D_7 -0/+0,5	d_8 -1/+1	d_9 -1/+1	h_2	
UF 8 special 2	8,2	11,2	14,6	$\approx 10,6$	75-00-008-ZG2

1.11.4 Ceramic ferrule for flat bar anchors and rectangular studs (type KF)



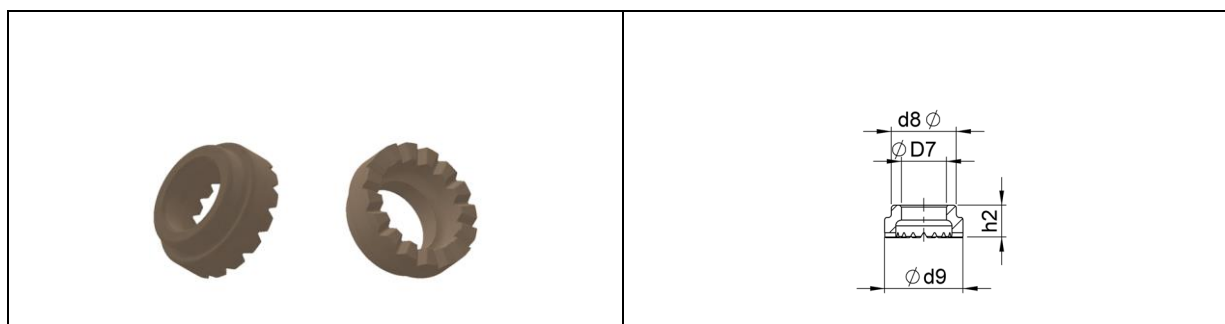
Description	Dimensions				Item number
	D_7 -0,7/+0,7	d_8 -1/+1	d_9 -1/+1	h_2	
KF 15x3	16	20,5	26,5	≈ 11	75-00-153
KF 15x5	16	20,5	26,5	≈ 11	75-00-155
KF 25x3	25,5	30,5	35,5	≈ 13	75-00-253
KF 25x5	25,5	30,5	35,5	≈ 13	75-00-255

1.11.5 Ceramic ferrule for slotted studs, boiler studs, fiberfix, threaded studs, insulation pins, internally threaded studs and non-threaded studs (type UF acc. to DIN EN ISO 13918)



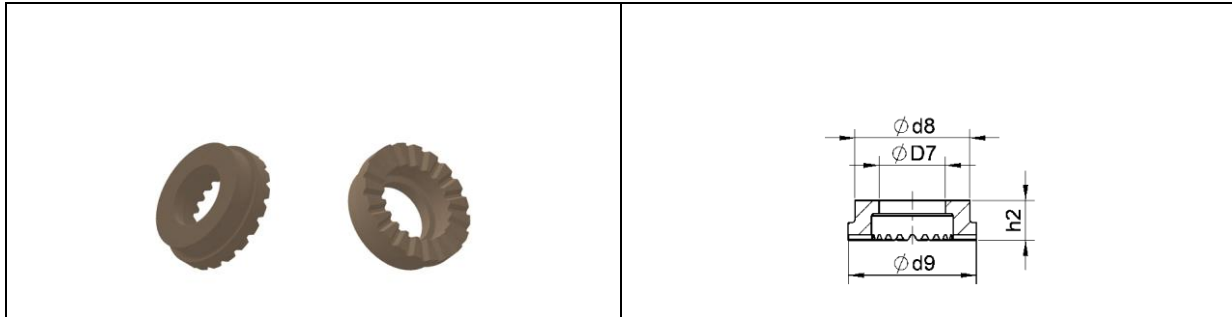
Description	Dimensions				Item number
	D_7 -0/+0,5	d_8 -1/+1	d_9 -1/+1	h_2	
UF 4	4,2	9,5	11,5	≈ 8,7	75-00-004
UF 5	5,2	9,5	11,5	≈ 8,7	75-00-005
UF 6	6,2	9,5	11,5	≈ 8,7	75-00-006
UF 8	8,2	11	15	≈ 8,7	75-00-008
UF 10	10,2	15	17,8	≈ 10	75-00-010
UF 12	12,2	16,5	20	≈ 10,7	75-00-012
UF 16	16,3	26	30	≈ 13	75-00-016
UF 20	20,4	26,1	32,8	≈ 14,2	75-00-020
UF 22	22,8	30,7	38,5	≈ 18,5	75-00-022

1.11.6 Ceramic ferrule for internally threaded studs and non-threaded studs (type KSN-F)



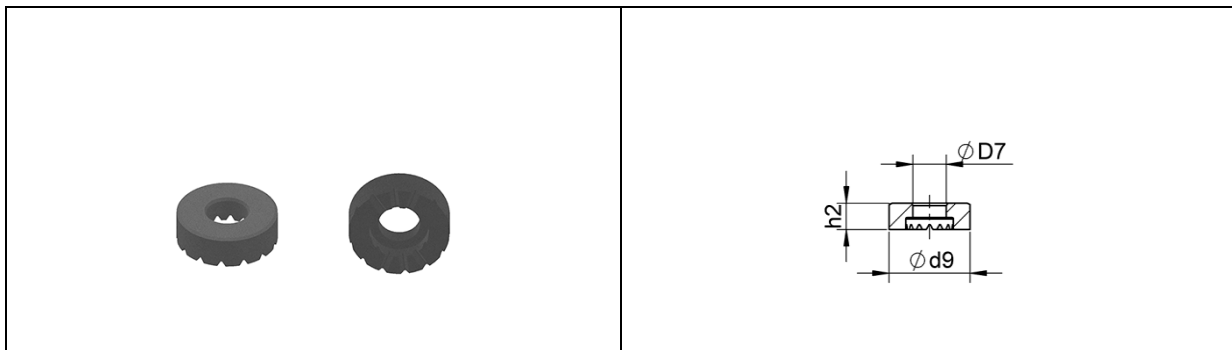
Description	Dimensions				Item number
	D_7 -0/+0,5	d_8 -1/+1	d_9 -1/+1	h_2	
KSN-F 8	8,25	14,8	18,3	≈ 4,8	75-00-008-F
KSN-F 10	10,25	14,8	17,8	≈ 7,4	75-00-010-F
KSN-F 12	12,25	20	23,2	≈ 6,3	75-00-012-F

1.11.7 Ceramic ferrule for threaded studs (type MF acc. to DIN EN ISO 13918, before: type KSP-F)



Description	Dimensions				Item number
	D_7 -0,4/+0,4	d_8 -1/+1	d_9 -1/+1	h_2	
MF 16	15,5	26	29	≈ 9	72-00-016-F-H
MF 20	19,3	30,7	33,8	≈ 10	72-00-020-F

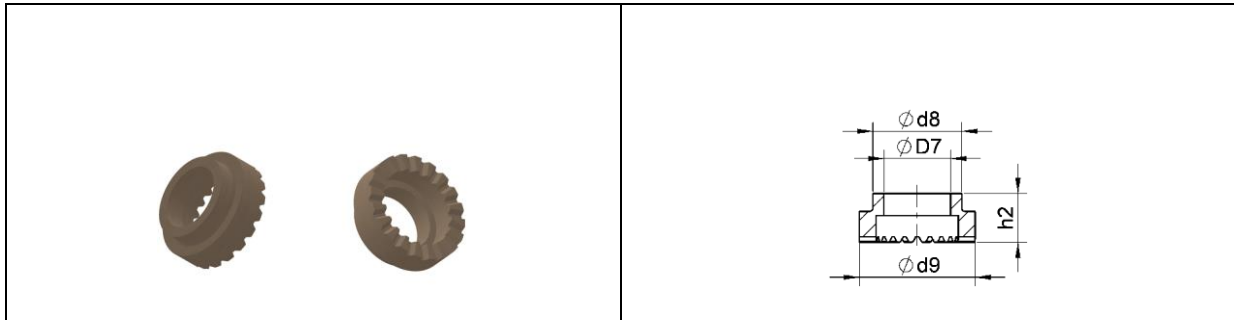
1.11.8 Ceramic ferrule for boiler studs (type KW)



Description	Dimensions			Item number
	D_7 -0/+0,5	d_9 -1/+1	h_2	
KW 10/5,5	10,2	17	$\approx 5,5$	75-00-010-KS

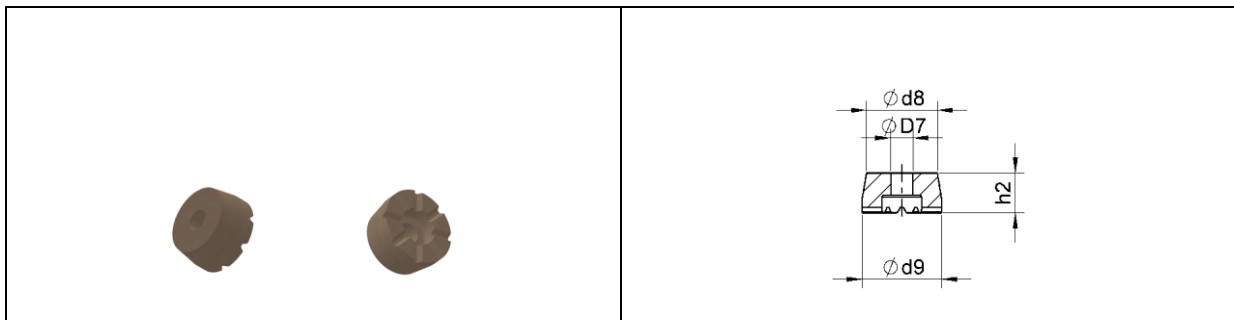


1.11.9 Ceramic ferrule for threaded studs (type PF acc. to DIN EN ISO 13918)



Description	Dimensions				Item number
	D_7 -0/+0,5	d_8 -1/+1	d_9 -1/+1	h_2	
PF 8	7,4	11,5	15	≈ 6,5	72-00-008
PF 10	9,2	15	17,8	≈ 6,5	72-00-010
PF 12	11,1	16,5	20	≈ 9	72-00-012
PF 16	15,0	20	26	≈ 11	72-00-016

1.11.10 Permanent ceramic ferrule for insulation pins (type K)



A permanent ceramic ferrule can be used for approx. 100 weldings of insulation pins.

Description	Dimensions				Item number
	D_7 -0/+0,5	d_8 -1/+1	d_9 -1/+1	h_2	
K 5	5,3	16,2	18	≈ 9	75-00-005-K5



Annex: Accessories and wear parts for stud welding guns

2. Accessories and wear parts for stud welding guns

2.1 Round bar anchor (type CV 1, CV 2, CV 4)

Stud dimensions		Gun accessories	
d ₁	l ₂	Chuck (item number)	Foot piece/ferrule grip (Gun type: item number)
6	l ₂ ≥ 35	83-72-050	PHM-160/161, GD 16/19/22/25: 83-30-000
8	l ₂ ≥ 35	83-72-055	PHM-160/161, GD 16/19/22/25: 83-30-000-8

2.2 Round bar anchor (type CV 2 reduced)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
5	l ₂ ≥ 35	83-60-006-T1	83-30-006-T1	PHM-12, GD 12/15: 83-41-022-M22

2.3 Round bar anchor (type CV 3)

Stud dimensions		Gun accessories	
d ₁	l ₂	Chuck (item number)	Foot piece/ferrule grip (Gun type: item number)
6	l ₂ ≥ 35	83-72-017	PHM-160/161, GD 16/19/22/25: 83-30-000

2.4 Round bar anchor (type STP, CTP, HTP)

Stud dimensions		Gun accessories	
d ₁	l ₂	Chuck (item number)	Foot piece/ferrule grip (Gun type: item number)
6	l ₂ ≥ 50	83-72-030	PHM-160/161, GD 16/19/22/25: 83-30-000
8	l ₂ ≥ 50	83-72-030	PHM-160/161, GD 16/19/22/25: 83-30-000-8

2.5 Flat bar anchor (type YHA, YHB), rectangular stud (type A, B, C)

Stud dimensions			Gun accessories		
b	s	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
15	3	≥ 20	83-03-015	65-11-00	PHM-160/161, GD 16/19/22/25: 83-40-029
15	5	≥ 20	83-05-015	65-11-00	PHM-160/161, GD 16/19/22/25: 83-40-029
25	3	≥ 25	83-03-025	65-13-00	PHM-160/161, GD 16/19/22/25: 83-40-044
25	5	≥ 25	83-05-025	65-13-00	PHM-160/161, GD 16/19/22/25: 83-40-044

2.6 Flat bar anchor (type YRA)

Stud dimensions				Gun accessories		
b	r	s	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
30	15	3	≥ 25	83-03-030	65-11-00	PHM-160/161, GD 16/19/22/25: 83-40-029



2.7 Slotted stud (type SF)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
10	l ₂ < 150 l ₂ ≥ 150	83-15-095 83-30-095	65-09-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022

2.8 Boiler stud (type KS)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
10	l ₂ < 20 l ₂ ≥ 20	25-97-00 83-50-010	65-09-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022

2.9 Fiberfix (type FFS, FFD)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
5	l ₂ ≥ 50	83-95-005	65-07-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022

2.10 Threaded stud (type DRS)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
5	l ₂ ≥ 50 l ₂ ≥ 100	83-50-005 83-50-005-15	65-07-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
6	l ₂ ≥ 50 l ₂ ≥ 100	83-50-006 83-50-006-15	65-07-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022



2.11 Insulation pin (type ISMS, ISA, ISB)

For welding without ceramic ferrules:

Stud dimensions		Gun accessories			
d ₁	l ₂	Chuck (item number)	Supporting tube (item number)	Teflon insert (item number)	Foot piece (Gun type: item number)
3	20 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-003 83-45-003 83-90-003	80-11-002	80-11-003	PHM-12, GD 12/15: 83-41-035 PHM-160/161, GD 16/19/22/25: 83-40-035
4	50 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-004 83-85-004	80-11-002	80-11-003	PHM-12, GD 12/15: 83-41-035 PHM-160/161, GD 16/19/22/25: 83-40-035
5	50 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-005 83-40-005 83-85-005	80-11-002	80-11-003	PHM-12, GD 12/15: 83-41-035 PHM-160/161, GD 16/19/22/25: 83-40-035

For welding with ceramic ferrules type UF:

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
3	20 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-003 83-45-003 83-90-003	65-06-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
4	50 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-004 83-85-004	65-06-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
5	50 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-005 83-40-005 83-85-005	65-07-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022

For welding with permanent ceramic ferrules type K:

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
3	20 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-003 83-45-003 83-90-003	65-31-01	PHM-12, GD 12/15: 83-41-022-M22
4	50 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-004 83-85-004	65-31-01	PHM-12, GD 12/15: 83-41-022-M22
5	50 ≤ l ₂ < 65 65 ≤ l ₂ < 110 l ₂ ≥ 110	83-25-005 83-40-005 83-85-005	65-31-01	PHM-12, GD 12/15: 83-41-022-M22

2.12 Threaded stud (type PD)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
M8	> 20	83-50-008	65-08-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
M10	> 20	83-50-010	65-09-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
M12	> 25	83-55-012	65-10-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
M16	> 30	83-55-016	65-11-00	GD 15: 83-41-029 PHM-160/161, GD 16/19/22/25: 83-40-029



2.13 Internally threaded stud (type ID), non-threaded stud (type UD)

Stud dimensions		Gun accessories		
d ₁	l ₂	Chuck (item number)	Ferrule grip (item number)	Foot piece (Gun type: item number)
6	l ₂ < 20 l ₂ ≥ 20	83-50-006-4 83-50-006	65-07-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
8	l ₂ < 20 l ₂ ≥ 20	83-50-008-4 83-50-008	65-08-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
10	l ₂ < 20 l ₂ ≥ 20	25-97-00 83-50-010	65-09-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
12	l ₂ < 25 l ₂ ≥ 25	25-31-00 83-55-012	65-10-00	PHM-12, GD 12/15: 83-41-022 PHM-160/161, GD 16/19/22/25: 83-40-022
14,6	l ₂ < 30 l ₂ ≥ 30	26-90-00 26-48-00	65-12-00	GD 15: 83-41-029 PHM-160/161, GD 16/19/22/25: 83-40-029
16	l ₂ < 30 l ₂ ≥ 30	25-99-00 83-55-016	65-12-00	PHM-160/161, GD 16/19/22/25: 83-40-029
18,3	l ₂ < 30 l ₂ ≥ 30	83-55-018-5 83-55-018	65-13-00	GD 19/22/25: 83-40-044
20	l ₂ ≥ 40	83-55-020	65-12-00	GD 22/25: 83-40-044
22	l ₂ ≥ 40	25-15-00	65-13-00	GD 22/25: 83-40-044



Bolte GmbH

Flurstraße 25
D-58285 Gevelsberg

Tel.: +49 (0)2332 55106-0
Fax: +49 (0)2332 55106-11

Ohmstraße 3
D-85221 Dachau

Tel.: +49 (0)8131 5159-0
Fax: +49 (0)8131 5159-11

E-Mail: info@bolte.gmbh



www.bolte.gmbh