



Welding studs

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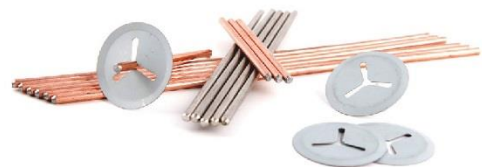
Spitzenzündung

PT-Spitzenzündung M2,5-M10								
	A2/A4 inox	St 4.8 verkupfert	Aluminium	Messing				Massebolzen
UT-Spitzenzündung Ø2-10								
	A2/A4 inox	St 4.8 verkupfert	Aluminium	Messing				
IT-Spitzenzündung Ø5-8mm M3-M6								
	A2/A4 inox	St 4.8 verkupfert	Aluminium	Messing				
Flachstecker /Doppelflachstecker								
	A2/A4 inox	St 4.8 verkupfert	Aluminium	Messing				
		IN- CD Nagel Ø2-3mm l 20-150mm St verk., A2, AlMg3		TS-Stifte Ø2-3mm l 20-150mm St verk., A2 Teller Ø 30/38mm				
								Grobewinde

Hubzündung

Hubzündung -Kurzzeit

PS-Kurzzeit-HZ M3-M8 4.8 verkupfert	PS-Kurzzeit-HZ M3-M8 A2/A4	US-Kurzzeit-HZ Ø5-8mm M3-M6	IS-Kurzzeit-HZ Ø5-8mm M3-M6
			
St 4.8 verkupfert	A2/A4 inox	St 4.8 verkupfert	A2/A4 inox



Iso-Stifte Ø 3-6mm
St/A2/A4
Feuerfestmaterialien



Hubzündung - Keramikring oder Schutzgas

	M6-M16	Form DD	Form PD	Form RD	Form ID	Form UD
						
			ID Ø6-16 M3-M12	UD Ø3-16		

Weld stud Tip ignition

1.1 Technical information

ARNHOLD welding studs are manufactured on modern machines using the cold heading process for highest product quality. All welding studs are subject to constant quality control for best welding results.

1.1.1 Materials

If not otherwise specified according to the standard DIN EN ISO 13918:2008 "Studs and ceramic rings for arc stud welding".

- **Steel**
grade 4.8 (suitable for welding) ISO 891-1 similar to S235 ISO 891-1 Re $\geq 340\text{N/mm}^2$
- Stainless and acid-resistant steel **A2-50**
DIN EN ISO 3506-1 Strength Rm $\geq 500\text{ N/mm}^2$, Re $\geq 210\text{N/mm}^2$
- Rust and acid-resistant steel **A5-50** DIN EN ISO 3506-1
- Aluminium **AlMg3** Rm $\geq 100\text{N/mm}^2$
- Brass **CuZn 37** Rm $\geq 370\text{N}$ Rm $\geq 370\text{N}$
- other materials on request
- Recommended tightening torques in chapter

1.1.2 Dimensions

The dimensions [in mm] of the bolts are described in the respective tables. All standardised welding studs comply with DIN EN ISO 13918:2008 and non-standardised elements are manufactured in accordance with the standard. Drawing parts on request.

The external threads are usually cold rolled and correspond to the tolerance layer 6g. Due to the work-hardening process, excellent pull-out values are achieved in the thread area.

1.1.3 Surface according to DIN EN ISO 13918:2008

Steel bolts are usually provided with a copper coating. This corresponds to C1E (4-8µm) unless otherwise specified. Galvanizing, tin plating, nickel plating and other surfaces are possible on request

1.1.4 Bolt flange

The stud flange serves to increase the welding surface and has positive characteristics for the arc. Optimum feedability is also guaranteed. An out-of-roundness of the flange within the tolerances is normal and process related. For special applications with limited strength requirements, bolts with mini flanges are also manufactured. Please inquire.

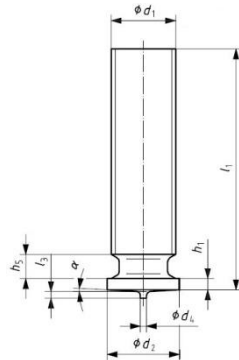
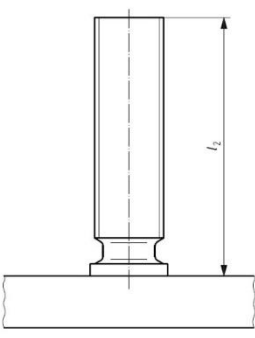
1.1.5 Ignition tip

A precisely shaped ignition tip is crucial for a reliable process. The tolerances are very tight. For optimum welding results, you should nevertheless always process all delivery batches separately.

1.1.6 Use

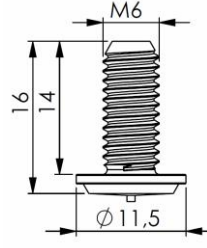
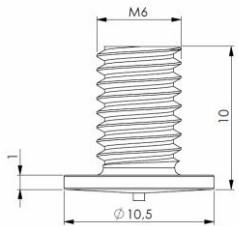
Unless ordered otherwise, the welding studs are supplied for use in a manual feeder. Optically sorted goods for highest demands on request.

1.2 PT Weld studs Tip ignition (threaded studs) according to DIN EN ISO 13918

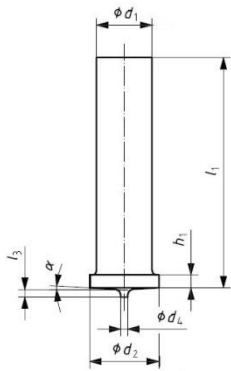
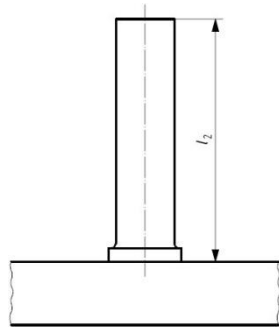
											
Before welding							After welding				
Dimensions							Materials				
d1	l1	d2 _{±0,2}	d4 _{±0,08}	l3 _{±0,05}	h5	h1	Steel verk.	A2-50	AlMg3	CuZn37	A5-50
M3	6-30	4,5	0,6	0,55	0,6	0,7-1,4	011-03-xxx	012-03-xxx	014-03-xxx	013-03-xxx	017-03-xxx
M4	6-40	5,5	0,65	0,55	0,6	0,7-1,4	011-04-xxx	012-04-xxx	014-04-xxx	013-04-xxx	017-04-xxx
M5	6-45	6,5	0,75	0,8	1	0,7-1,4	011-05-xxx	012-05-xxx	014-05-xxx	013-05-xxx	017-05-xxx
M6	8-60	7,5	0,75	0,8	1	0,7-1,4	011-06-xxx	012-06-xxx	014-06-xxx	013-06-xxx	017-06-xxx
M8	10-60	9	0,75	0,85	1,5	0,8-1,4	011-08-xxx	012-08-xxx	*014-08-xxx	013-08-xxx	017-08-xxx
M10	12-60	10,7	0,75-0,8	0,75-0,85	3	1,2-1,6	011-10-xxx	012-10-xxx		*013-10-xxx	017-10-xxx
Not listed dimensions on request and following DIN EN ISO 13918							Xxx = nominal length in mm, 12mm = 012 standard lengths: 8,10,12,15,16,20,25,30,35,40,45,50,55,60* conditionally weldable				

suitable welding equipment. e.g. AS 1066, AS 1066A, AS 1095B, AS1095MC, automatic components
 suitable welding guns e.g. AS1802,AS1803,AS1901

1.3 PT Ground bolt / earth bolt

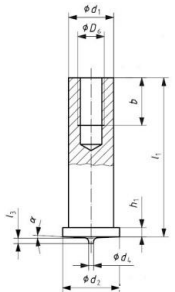
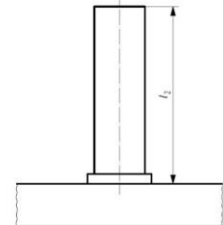
							
01106116				01106110			
Before welding				Before welding			
Dimensions				Materials			
Order number	Thread	Flange	Material	Order number	Thread	Flange	Material
01106116	M6x14	11,5	Steel verk.	01106110	M6x10	10,5	Steel verk.
01706160	M6x14	12	1.4401 (A4-50)	01104110	M4x10	7,5	Steel verk.
01206160	M6x14	10	A2-50				
01208117	M8x20	16	A2-50				
Other shapes, dimensions or materials on request							

1.4 UT welding studs Tip ignition (pins) according to DIN EN ISO 13918

										
Before welding						After welding				
Dimensions						Materials				
d1	l1	d2 ±0,2	d4 ±0,08	l3 ±0,05	h1	Steel verk.	A2-50	AlMg3	CuZn37	A5-50
Ø3	6-30	4,5	0,6	0,55	0,7-1,4	021-03-xxx	022-03-xxx	024-03-xxx	023-03-xxx	027-03-xxx
Ø4	6-40	5,5	0,65	0,55	0,7-1,4	021-04-xxx	022-04-xxx	024-04-xxx	023-04-xxx	027-04-xxx
Ø5	6-45	6,5	0,75	0,8	0,7-1,4	021-05-xxx	022-05-xxx	024-05-xxx	023-05-xxx	027-05-xxx
Ø6	8-60	7,5	0,75	0,8	0,7-1,4	021-06-xxx	022-06-xxx	024-06-xxx	023-06-xxx	027-06-xxx
Ø7,1	10-60	9	0,75	0,85	0,8-1,4	021-71-xxx	022-07-xxx	#024-07-xxx	023-07-xxx	027-07-xxx
Not listed dimensions on request and following DIN EN ISO 13918						Xxx = Nominal length in mm, 12mm = 012 standard lengths:8,10,12,15,16,20,25,30,35,40,45,50,55,60*conditionally weldable				

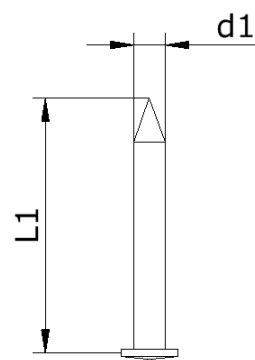
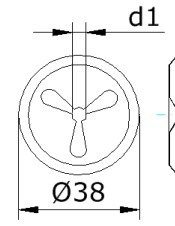
Suitable welding equipment: e.g. AS 1066, AS 1066A, AS 1095B, AS1095MC, automatic component suitable welding guns: e.g. AS1802,AS1803,AS1901

1.5 IT Weld studs Tip ignition (internal threaded studs) according to DIN EN ISO 13918

												
Before welding								After welding				
Dimensions								Materials				
d1	l1	d2 ±0,2	b≥	d4±0,08	l3±0,05	h5	h1	Steel verk.	A2-50	AlMg3	CuZn37	A5-50
Ø5M3	6-30	6,5	5*1	0,6	0,55	0,6	0,7-1,4	031-35-xxx	032-35-xxx	034-35-xxx	033-35-xxx	037-35-xxx
Ø6M4	6-40	7,5	⁶¹	0,65	0,55	0,6	0,7-1,4	031-46-xxx	032-46-xxx	034-46-xxx	033-46-xxx	037-46-xxx
Ø7.1M5	6-45	9	7 ⁵¹	0,75	0,8	1	0,7-1,4	031-57-xxx	032-57-xxx	034-57-xxx	033-57-xxx	037-57-xxx
Ø8 M6	8-60	9	7 ⁵¹	0,75	0,8	1	0,7-1,4	031-68-xxx	032-68-xxx			
* if l=6 is b=4, ¹ the current thread depths in the article apply												
Not listed dimensions on request and following DIN EN ISO 13918								Xxx = Nominal length in mm, 12mm = 012 Standard lengths:8,10,12,15,16,20,25,30,35,40,45,50,55,60				

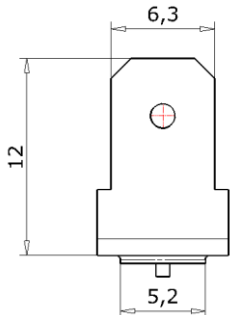
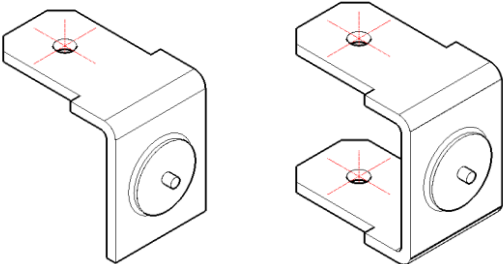
Suitable welding equipment: e.g. AS 1066, AS 1066A, AS 1095B, AS1095MC, automatic component suitable welding guns e.g. AS1802,AS1803,AS1901

1.6 IN welding stud tip ignition (insulation nail and clip)

											
Isonagel							Clip				
Dimensions							Materials				
Nail d1	l1	d2	d4±0,1	l3±0,1	h5	h1	Steel verk.	A2-50	AlMg3	CuZn37	A5-50
Ø2	20-160	3,9-4,5	0,75	0,8	3-5	0,6-1	041-02-xxx	042-02-xxx	044-02-xxx	On request	On request
Ø3	20-200	5-5,6	0,75	0,8	3-5	0,6-1,2	041-03-xxx	042-03-xxx	044-03-xxx	On request	On request
Clip							Galvanized steel	A2-50	A4-50	Isolated	With cap
38xØ2	8-60					0,4	077-02-002	078-02-002	On request	On request	On request
38xØ3	10-60					0,4	077-03-003	078-03-003	On request	On request	On request
Not listed dimensions on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012 * conditionally weldable				

Suitable welding equipment: e.g. AS 1066, AS 1066A, AS 1095B, AS1095MC, automatic component suitable welding guns: e.g. AS1802,AS1803,AS1901

1.7 FS Flat plug tip ignition , Double flat plug

										
Dimensions						Materials				
Form						Steel verk.	A2-50	AlMg3	CuZn37	A4-50
Simply	See	above				029-011-63	029-012-63	029-014-63	029-013-63	029-017-63
Double						129-011-63	129-012-63	129-014-63	129-013-63	129-017-63
Welding data like form PT M4										

suitable welding equipment: e.g. AS 1066, AS 1066A, AS 1095B, AS1095MC, automatic components suitable welding guns: e.g. AS1802,AS1803,AS1901

2 Drawn ignition

2.1 Technical information

2.1.1 Materials

For all common types of bolts, the materials according to DIN EN ISO 13918 are used. Special materials are conceivable and can be checked by us for availability and weldability. We would be pleased to advise you on your welding task.

When placing an order, please let us know whether you require a works or acceptance test certificate according to DIN EN10204 (2.2 / 3.1)

1. unalloyed steels 4.8 (similar to former ST37)

Arnhold welding studs are manufactured from steel of strength class 4.8 (DIN EN 898-1) with excellent welding properties. $R_e \geq 340 \text{ N/mm}^2$, $R_m \geq 420 \text{ N/mm}^2$, Elongation $A_5 \geq 15\%$,

2. corrosion resistant steels (A2-50)

Weld studs made of alloyed steels are usually made of material A2-50 (DIN EN ISO 3506-1). $R_{p0,2} \geq 210 \text{ N/mm}^2$, $R_m \geq 500 \text{ N/mm}^2$, Elongation $A_L \geq 0,6d$,

In addition, the materials A4, A5 1.4571, 1.4401 and 1.5415(16Mo3) are also used

2.1.2 Dimensions

Please take the dimensions from the corresponding tables for your bolt type. Standardised bolts are manufactured according to DIN EN ISO 13918. Not included dimensions and special shapes according to this standard to continue to achieve the best welding results.

Drawn arc studs melt off differently during welding. The specified article lengths correspond to the nominal stud length after welding.

The welding allowance of 1 - 5mm is dimensioned so that the stud reaches the nominal length at recommended parameters.

2.1.3 Aluminium ball and other fluxes

Weld studs for the ceramic ring process are provided with an aluminium addition in the welding area from a diameter of 8-10. Usually this is achieved by a pressed-in aluminium ball.

Studs up to M10 can also be welded without ceramic ring under inert gas. In this case welding studs without ball should be used to avoid defects and to improve the flow properties. Under inert gas, an increased arc blowing effect must be expected. Welding in difficult situations is more difficult.

2.1.4 weld pool backing Ceramic ring welding

For each ceramic ring stud a ceramic ring is supplied, which serves as weld pool protection. This ceramic ring is supplied in matching numbers with the bolts and can only be used once. It is smashed after welding.

Ceramic rings must be stored in a dry place to obtain the best welding results. Re-drying wet rings is usually not economical and purposeful.

2.1.5 Surfaces

Drawn arc welding studs are usually supplied bright. On request in the surfaces:

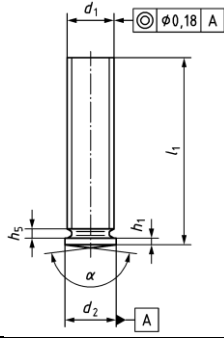
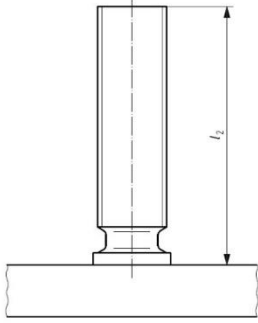
1. electrogalvanized
2. electrogalvanized, yellow chromated (not RoHS compliant)
3. zinc plated, blue passivated (RoHS compliant)
4. zinc flake coated
5. galvanically copper and nickel-plated
6. electroplated copper

The surfaces 1-4 are mechanically removed after coating in the welding area to improve weldability.

2.1.6 Thread

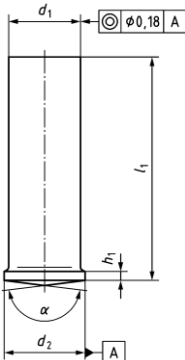
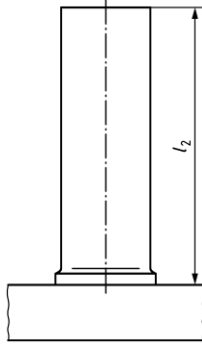
The threads are usually cold formed and correspond to the tolerance level 6g without surface and 6h with surface.

2.2 PS Short-term welding studs (threaded studs) according to DIN EN ISO 13918

											
Before welding							After welding				
Dimensions							Materials				
d1	l1	d2 _{±0,2}	d4 _{±0,08}	l3 _{±0,05}	h5	h1	Steel verk.	A2-50			A5-50
M3	6-30	4	0,6	0,55	0,6	0,7-1,4	111-03-xxx	112-03-xxx			117-03-xxx
M4	6-40	5	0,65	0,55	0,6	0,7-1,4	111-04-xxx	112-04-xxx			117-04-xxx
M5	6-45	6	0,75	0,8	1	0,7-1,4	111-05-xxx	112-05-xxx			117-05-xxx
M6	8-60	7	0,75	0,8	1	0,7-1,4	111-06-xxx	112-06-xxx			117-06-xxx
M8	10-60	9	0,75	0,85	1,5	0,8-1,4	111-08-xxx	112-08-xxx			117-08-xxx
M10	12-60	10,7	0,75-0,8	0,75-0,85	3	1,2-1,6	111-10-xxx	112-10-xxx			117-10-xxx
Not listed dimensions on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012 standard lengths:8,10,12,15,16,20,25,30,35,40,45,50,55,60* conditionally weldable				

Suitable welding equipment: e.g. AS 2008MC,AS2016MC, automatic components Suitable
welding guns: e.g. AS2901,AS2902,AS2701

2.3 US Short term welding studs (pins) according to DIN EN ISO 13918

											
Before welding							After welding				
Dimensions							Materials				
d1	l1	d2 _{±0,2}	d4 _{±0,08}	l3 _{±0,05}		h1	Steel verk.	A2-50	AlMg3	CuZn37	A5-50
Ø3	6-30	4	0,6	0,55		0,7-1,4	121-03-xxx	122-03-xxx			127-03-xxx
Ø4	6-40	5	0,65	0,55		0,7-1,4	121-04-xxx	122-04-xxx			127-04-xxx
Ø5	6-45	6	0,75	0,8		0,7-1,4	121-05-xxx	122-05-xxx			127-05-xxx
Ø6	8-60	7	0,75	0,8		0,7-1,4	121-06-xxx	122-06-xxx			127-06-xxx
Ø7,1	10-60	9	0,75	0,85		0,8-1,4	121-71-xxx	122-07-xxx			127-07-xxx
Not listed dimensions on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012 standard lengths:8,10,12,15,16,20,25,30,35,40,45,50,55,60*conditionally weldable				

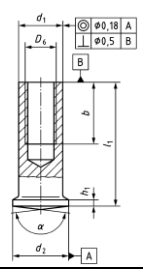
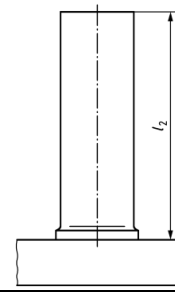
Suitable welding equipment. e.g. AS 2008MC,AS2016MC, automatic component suitable
welding guns e.g. AS2901,AS2902,AS2701

AS Schweißtechnik GmbH, 58454 Witten

+49 2302 95640-0

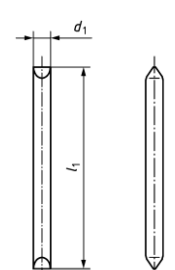
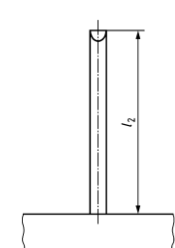
www.bolzenschweissen.de

2.4 IS Short-term welding studs (internal threaded studs) according to DIN EN ISO 13918

												
Before welding								After welding				
Dimensions								Materials				
d1	l1	d2 ±0,2	b≥	d4±0,08	l3±0,05	h5	h1	Steel verk.	A2-50			A5-50
Ø5M3	6-30	6	5*	0,6	0,55	0,6	0,7-1,4	131-35-xxx	132-35-xxx			137-35-xxx
Ø6M4	6-40	7	6	0,65	0,55	0,6	0,7-1,4	131-46-xxx	132-46-xxx			137-46-xxx
Ø7.1M5	6-45	9	7,5	0,75	0,8	1	0,7-1,4	131-57-xxx	132-57-xxx			137-57-xxx
Ø8 M6	8-60	9	7,5	0,75	0,8	1	0,7-1,4	132-68-xxx	132-68-xxx			
* where l=6 is b=4												
Not listed dimensions on request and following DIN EN ISO 13918								Xxx = Nominal length in mm, 12mm = 012 Standard lengths:8,10,12,15,16,20,25,30,35,40,45,50,55,60				

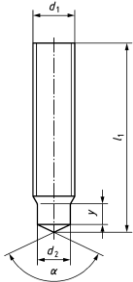
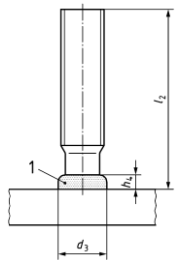
Suitable welding equipment: e.g. AS 2008MC,AS2016MC, automatic components Suitable
welding guns: e.g. AS2901,AS2902,AS2701

2.5 ND Drawn arc welding pins according to DIN EN ISO 13918

											
Before welding							After welding				
Usually ground on one side, others on request							Materials				
d1±0,1	l1						Steel 4.8	A2-50	S2Mo,(16Mo3) 1.4841, 13CrMo4-5	A5-50	Ceramic ring
Ø2	15-500						066-02-xxx	067-02-xxx	heat resistant	on request	-
Ø3	15-500						066-03-xxx	067-03-xxx	heat resistant	on request	-
Ø4	15-500						066-04-xxx	067-04-xxx	heat resistant	on request	-
Ø5	20-500						066-05-xxx	067-05-xxx	heat resistant	on request	UF5
Not listed dimensions and materials on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 50mm = 050				

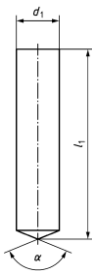
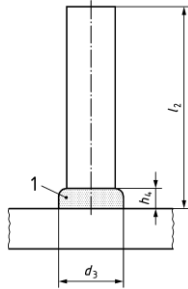
suitable welding equipment. e.g. AS 2008MC,AS2016MC
suitable welding guns e.g. AS2901, AS2701

2.6 RD Ceramic ring welding studs (threaded studs) according to DIN EN ISO 13918

											
Before welding							After welding				
Dimensions							Materials				
d1	l1	d2 ±0,2	Y+2P	$\alpha \pm 7^\circ$	h4	d3	Steel 4.8	A2-50	Galvanized steel	A5-50	Ceramic ring
M6	15-50	4,7	4	140	2,5	7	041-06-xxx	042-06-xxx	320-06-xxx	340-06-xxx	RF6
M8	15-80	6,2	4	140	2,5	9	041-08-xxx	042-08-xxx	320-08-xxx	340-08-xxx	RF8
M10	15-100	7,9	5	140	3	11,5	041-10-xxx	042-10-xxx	320-10-xxx	340-10-xxx	RF10
M12	20-100	9,5	6	140	4	13,5	041-12-xxx	042-12-xxx	320-12-xxx	340-12-xxx	RF12
M16	25-100	13,2	7,5/11*	140	5	18	041-16-xxx	042-16-xxx	320-16-xxx	340-16-xxx	RF16
Standard lengths: 15,16,20,25,30,35,40,45,50,55,60,65,80 Not listed dimensions and materials on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012* depending on ceramic ringAll numbers listed are from M8 with aluminium ball. Without aluminium ball for inert gas application on request				

suitable welding equipment: e.g. AS 2008MC,AS2016MC, suitable welding guns: e.g. AS2901, AS2701

2.7 UD ceramic ring welding pins according to DIN EN ISO 13918

											
Before welding							After welding				
Dimensions							Materials				
d1±0,1	l1			$\alpha \pm 7^\circ$	h4	d3	Steel 4.8	A2-50	Galvanized steel	A5-50	Ceramic ring
Ø6	15-50			140	4	8,5	314-06-xxx	334-06-xxx	324-06-xxx	344-06-xxx	UF6
Ø8	15-80			140	4	11	314-08-xxx	334-08-xxx	324-08-xxx	344-08-xxx	UF8
Ø10	15-100			140	4	13	314-10-xxx	334-10-xxx	324-10-xxx	344-10-xxx	UF10
Ø12	20-100			140	7	16	314-12-xxx	334-12-xxx	324-12-xxx	344-12-xxx	UF12
Ø14,6	25-100			140	6	18,5	314-14-xxx	334-14-xxx	324-14-xxx	344-14-xxx	UF14
Ø16	25-100			140	5	21	314-16-xxx	334-16-xxx	324-16-xxx	344-16-xxx	UF16
Standard lengths: 15,16,20,25,30,35,40,45,50,55,60,65,80 Not listed dimensions and materials on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012* depending on ceramic ringAll numbers listed are from M8 with aluminium ball. Without aluminium ball for inert gas application on request				

Suitable welding equipment: e.g. AS 2008MC,AS2016MC

Suitable welding guns: e.g. AS2901, AS2701

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2.8 ID Ceramic ring - Internal grub screws according to DIN EN ISO 13918

Before welding							After welding				
Dimensions							Materials				
$d2 \pm 0,1 / d6$	$l1$	$b+2p$	$\alpha \pm 7^\circ$	$h4$	$d3$	Steel 4.8	A2-50	Galvanized steel	A5-50	Ceramic ring	
$\emptyset 10 M5$	15-80	7,5	140	4	11	316-06-xxx	336-06-xxx	on request	on request	UF6	
$\emptyset 10 M6$	15-100	9	140	4	13	316-08-xxx	336-08-xxx	on request	on request	UF8	
$\emptyset 12 M8$	20-100	12	140	7	16	316-12-xxx	336-12-xxx	on request	on request	UF12	
$\emptyset 14.6 M8$	25-100	15	140	6	18,5	316-14-xxx	336-14-xxx	on request	on request	UF14	
$\emptyset 16 M10$	25-100	15	140	5	21	314-16-xxx	336-16-xxx	on request	on request	UF16	
Standard lengths: 15,16,20,25,30,35,40,45,50,55,60,65,80 Not listed dimensions and materials on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012* depending on ceramic ringAll numbers listed are from M8 with aluminium ball. Without aluminium ball for inert gas application on request				

suitable welding equipment. e.g. AS 2008MC, AS2016MC
suitable welding guns e.g. AS2901, AS2701

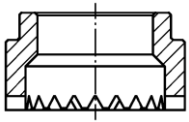
2.9 PD Ceramic ring welding studs (threaded studs) according to DIN EN ISO 13918

Before welding							After welding				
Dimensions							Materials				
$d1$	$l1$	$d2 \pm 0,2$	$Y+2P$	$\alpha \pm 7^\circ$	$h4$	$d3$	Steel 4.8	A2-50	Galvanized steel	A5-50	Ceramic ring
M6	15-50	5,35	9	140	3,5	8,5	312-06-xxx	332-06-xxx	322-06-xxx	on request	PF6
M8	15-80	7,19	9	140	3,5	10	312-08-xxx	332-08-xxx	322-08-xxx	on request	PF8
M10	15-100	9,3	9,5	140	4	12,5	312-10-xxx	332-10-xxx	322-10-xxx	on request	PF10
M12	20-100	10,86	11,5	140	4,5	15,5	312-12-xxx	332-12-xxx	322-12-xxx	on request	PF12
M16	25-100	14,6	13,5	140	6	19,5	312-16-xxx	332-16-xxx	322-16-xxx	on request	PF16
Standard lengths: 15,16,20,25,30,35,40,45,50,55,60,65,80 Not listed dimensions and materials on request and following DIN EN ISO 13918							Xxx = Nominal length in mm, 12mm = 012* depending on ceramic ringAll numbers listed are from M8 with aluminium ball. Without aluminium ball for inert gas application on request				

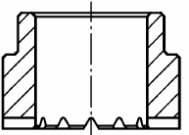
2.10 Ceramic rings according to DIN EN ISO 13918

Ceramic rings are a disposable product and are supplied in matching quantities to the welding studs. They have the task of centering the arc and limiting the liquid weld metal. After welding, they are removed mechanically, e.g. with a hammer.

Please refer to the corresponding bolt arrangement for the possible combinations.



Form UF,PF , usually runs on the smooth part of the stud and has a cavern for the welding bead

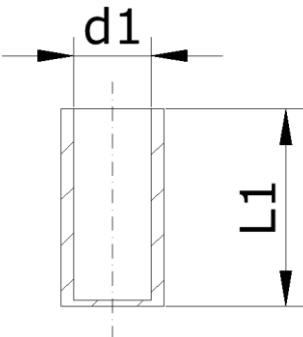



Form RF , usually runs on the thread of the stud and has no cavern for the welding bead. This already results from the reduced welding area and the ceramic ring


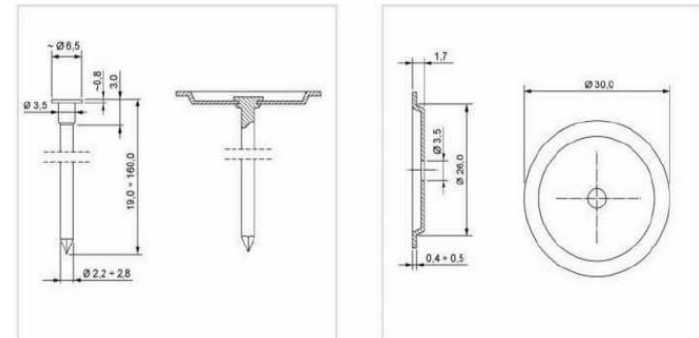
3 Other elements

3.1 Cover caps / silicone caps for welding studs according to DIN EN ISO 13918

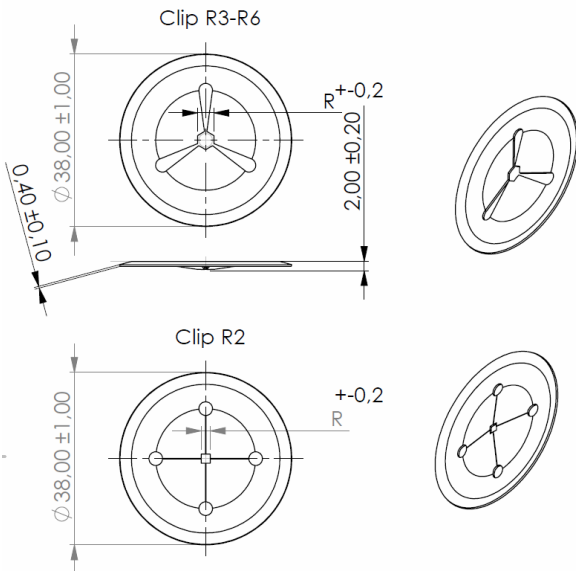
Silicone caps are used to mask studs during further coating. They are reusable and resist the high temperatures of powder coating (up to 315°C)

											
Dimensions											
D1x l1	Silicone										
Ø2x12	0389-00-02										
Ø3x12	0389-00-03										
Ø4x12	0389-00-04										
Ø5x12	0389-00-05										
Ø6x12	0389-00-06										
Ø6x20	0389-00-60										
Ø7,1	0389-00-71										
Ø8x19	0389-00-08										
Ø10x25	0389-00-10										
Flat connector	0389-00-63										
Not listed dimensions and materials on request											

3.2 Disc Pins

			
		<p>Alternatively with partially insulated shaft for aluminium lamination</p>	
Disc pins without insulation		Alternatively with insulator for plate and shaft	
Standard		Order number	
Insulation strength	Plate \varnothing	Pin \varnothing	Shaft Insulated
20,25,30,40,50,60,63,75,80,90,95,100	30	2,7	no
The actual pin length is > Insulation thickness	30	2,7	yes
	38	2,7	no
	38	2,7	yes
Standard material: plate steel galvanized, pin steel copper-plated, stainless steel available on request, packing unit 1000 pcs.			

3.3 Clips



Bezeichnung Stiftdurchmesser	Maß R
R2	2
R3	2,3
R4	3,6
R5	4,7
R6	5,7

Materials : galvanized steel, A2 stainless, A4 stainless, with cap, insulated,

4 Technical Information Stud Welding

4.1 Sample tightening torques for threaded bolts

Reference for the minimum tensile force and the minimum torque of a welded joint without
 The following table shows the permanent deformation of the parts to be joined. The prerequisite is that a sufficient
 Wall thickness. The values apply to threaded bolts with standard threads without
 Surface protection and without thread lubrication. Over the entire bolt length, at least
 the voltage cross section must be present (no RD bolts) . The values are valid for the specified yield strengths.
 The stated values are recommendations under the stated conditions and must be adapted to the actual application.

Bolt size	Steel 4.8, Rp0.2=230N/mm2	A2-50, Rp0.2=210N/mm2	AlMg3 F23, Rp0.2=170N/mm2
M3	0,5	0,3	0,2
M4	1,2	0,7	0,6
M5	2,2	1,4	1,1
M6	4	2,5	2,0
M8	9,5	6	4,7
M10	18,5	12	9,5
M12	32,5	20	16
M16	80	50	

Table: Assembly tightening torques in Nm

4.2 Strengths of weld stud connections

In general, it is assumed that the connection does not fail in the weld when it is properly welded. According to this,
 the deformation or breakage occurs in the bolt or base material. Deviations from this are to be considered in a
 differentiated manner for welding studs with reduced welding area (e.g. mini-flange studs) or unsuitable material
 pairings, such as black and white joints. In case of doubt, the quality of these joints shall be demonstrated by a
 procedure qualification.

This results in a load limit in the calculation, which results from the base material or the bolt material with the forces
 introduced. Decisive for strength calculations here is the force(stress in the stress cross section and the
 corresponding material characteristics with a safety factor.