



Technical data for KÖCO-welding studs

All KÖCO welding studs are made from materials suitable for stud welding. Dimensions and design of our standard products conform to DIN EN ISO 13918, any non-standard products supplied will be produced to correspond to the norm. If you wish to use a type of stud other than those listed, please send us your enquiry and consult our specialists about your welding task.

KÖCO welding studs are available in different materials. Upon request the properties of each can be documented by test report 2.2 or inspection certificate 3.1 or 3.2 (EN 10204).

Non-alloy structural steel:

KÖCO non-alloy structural steel welding studs are manufactured from S235 according to EN 10025:2005 with more stringent requirements for carbon content, degree of purity, grain size and surface properties. This makes the material ideally suited for stud welding. Through cold forming the material's tensile strength and yield strength are enhanced and a favourable grain structure is also achieved.

For threaded studs, pins, tapped studs and similar products, we guarantee mechanical properties according to DIN EN ISO 898-1, property class 4.8.

Tensile strength: R_m	≥ 420 /mm ²
Yield strength: R_{el}	≥ 340 /mm ²
Elongation: A_5	$\geq 14\%$

We supply shear connectors manufactured from S235J2+C450 according to EN 10025:2005 with the following mechanical properties:

Tensile strength: R_m	≥ 450 N/mm ²
Yield strength: R_{el}	≥ 350 N/mm ²
Elongation: A_5	$\geq 15\%$

Steel construction components with welded-on KÖCO shear connectors have been approved by Deutsches Institut für Bautechnik (DIBt, German Institute for Building Engineering) under European Technical Approval ETA-03/0039 dated Nov.13, 2003.

Stainless steel:

We supply KÖCO threaded studs, pins, tapped studs and similar products made from A2-50 according to DIN EN ISO 3506-1.

Tensile strength: R_m	≥ 500 /mm ²
Yield point: $R_{p0.2}$	≥ 210 /mm ²
Elongation: A_5	$\geq 25\%$

KÖCO welding studs made from stainless and acid-resistant steels such as 1.4541, 1.4571, 1.4401, 1.4404 in

various property classes are available upon request.

We supply stainless steel shear connectors made of 1.4301 in accordance with EN 10088:1995 with the following mechanical properties:

Tensile strength: R_m	540-780 N/mm ²
Yield Point: $R_{p0.2}$	≥ 350 N/mm ²

Stainless steel construction components with welded-on KÖCO shear connectors have been approved by Deutsches Institut für Bautechnik (DIBt, German Institute for Building Engineering, under European Technical Approval ETA-03/0040 dated Nov. 13,2003.

Heat- and scale-resistant KÖCO welding studs are manufactured from 1.4713, 1.4742, 1.4762, 1.4828, 1.4841, 2.4851 or 2.4856. Other materials are available upon request.

Stud dimensions:

Generally, the nominal length is the length of the stud "after welding". The studs delivered are 1 to 5 mm longer than their specified nominal length (except KÖCO KKS boiler tube studs and KÖCO KHS concave pins). This enables the welding parameters to be checked by measuring the stud length after welding.

Threads:

The threads of KÖCO studs are cold rolled and manufactured in accordance with DIN 13-20, tolerance 6g. Non-standard threads are available upon request.

Flux:

KÖCO studs for welding with ceramic ferrules are provided with an aluminium tip as required by the welding process, to facilitate the ignition of the arc, to stabilize the arc and to deoxidize the welding pool. The correct amount of flux used is an essential factor in obtaining perfect welding results.

Surface protection:

Unless specified otherwise, KÖCO welding studs are delivered uncoated. The manufacturing process requires surface coating of the wire, which cannot be removed from the stud shank but does not impair weldability. The codes for materials and types of surface are given in the last three digits of the article number, according to the following table (excerpt):

001	Non-alloy structural steel, uncoated
002	Stainless steel A2-50 / A2-70
005	A4-70
008	1.4713 (Sicromal 8)
009	1.4742 (Sicromal 10)
011	1.4828
012	1.4841
018	16Mo3
013	2.4851 (Inconel 601)
054	19MnB4, hardened
057	2.4856 (Inconel 625)
101	4.8, A2L zinc-plated and yellow chrome-plated
100	4.8, A2K (zinc-plated)
103	4.8, C2E (copper-plated)
102	4.8, G2E (nickel-plated on copper-plated base)

In the case of zinc-plated studs, the zinc coating is removed at the welding tip to prevent contamination of the welding pool.

Ceramic Ferrules:

In stud welding with ceramic ferrules each ferrule can be used only once. The ferrules required for welding are generally included in the delivery of the studs. Ceramic ferrules are not available without studs.

Weld collar:

In the course of stud welding a weld collar is formed where the stud is joined to the work-piece. Its dimensions depend on the welding parameters as well as the ceramic ferrule used. In this area threads, for example, cannot be utilised.

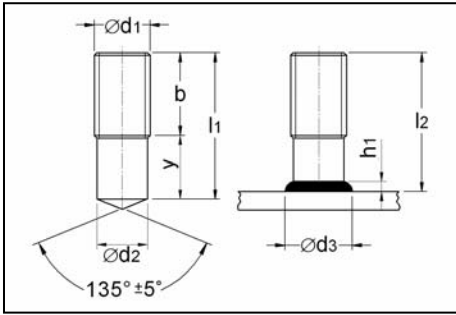
Ordering example:

KÖCO threaded stud PD M 20 x 100, material 4.8, weldable, uncoated: Article No. 001-0487-001, ceramic ferrule PF 20.

In case of other materials or surface coatings the last three digits of the article number must be changed as shown in the table above.



KÖCO PD DIN EN ISO 13918
 Gewindebolzen mit Teilgewinde
 Threaded stud with partial thread
 Goujon partiellement fileté
 Espárrago roscado



d ₁	l ₂	h ₁ ¹	d ₂	d ₃ ¹	b	y _{min}	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramiking Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago								
M 6	20	3,5	5,35	8,5		9	001-0041-001	0,38	PF 6 (P 6)	350-0005-000								
	25						001-0043-001	0,45										
	30						001-0046-001	0,55										
	35						001-0047-001	0,64										
	40						001-0048-001	0,73										
	50						001-0050-001	0,91										
	60				20		001-0052-001	1,08										
M 8	20	3,5	7,19	10		9	001-0081-001	0,69	PF 8 (P 8)	350-0007-000								
	25						001-0085-001	0,84										
	30						001-0087-001	1,0										
	35						001-0088-001	1,16										
	40						001-0093-001	1,32										
	45						001-0096-001	1,48										
	50						001-0097-001	1,64										
	55						001-0098-001	1,8										
	60						001-0099-001	1,96										
	80						001-0104-001	2,6										
	100						001-0108-001	3,18										
	M 10						20	4			9,03	12,5		9,5	001-0191-001	1,09	PF 10 (P 10)	350-0009-000
25		001-0192-001	1,34															
30		001-0193-001	1,57															
35		001-0197-001	1,84															
40		001-0201-001	2,09															
50		001-0207-001	2,60															
55		001-0210-001	2,85															
60		001-0218-001	3,08															
70		001-0222-001	3,60															
80		001-0224-001	4,10															
100		001-0232-001	5,11															
140		001-0243-001	7,12															
150		001-0386-001	7,62															
160		001-0261-001	8,13															
M 12		25	4,5	10,86	15,5		11,5		001-0294-001	1,95					PF 12 (P 10)	350-0011-000		
		30							001-0296-001	2,31								
	35	001-0298-001						2,64										
	40	001-0300-001						30,4										
	45	001-0302-001						3,40										
	50	001-0305-001						3,76										
	60	001-0307-001						4,49										
	70	001-0310-001						5,22										
	80	001-0314-001						5,94										
	100	001-0357-001						7,40										
	120	001-0323-001						8,85										
	140	001-0328-001						10,31										
	150	001-0358-001						11,03										
	160	001-0334-001						11,76										

¹ h₁ und d₃ sind Richtwerte.

¹ h₁ and d₃ are approximate values.

¹ h₁ et d₃ sont des valeurs indicatives.

¹ h₁ y d₃ valores indicativos.

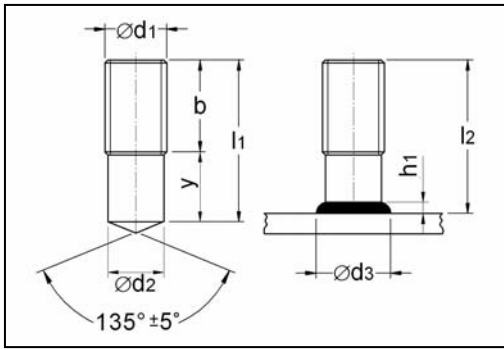
² Artikel-Nr. gilt für Stahl, Festigkeit 4.8, blank, andere Ausführungen siehe Tabelle Seite 1.

² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.



KOCO PD DIN EN ISO 13918
 Gewindebolzen mit Teilgewinde
 Threaded stud with partial thread
 Goujon partiellement fileté
 Espárrago roscado

mit/with/avec/con



Bauregelliste (DIBt)

d ₁	l ₂	h ₁ ¹	d ₂	d ₃ ¹	b	y _{min}	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramikring Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago									
M 16	30	6	14,7	19,5		13,5	001-0391-001	4,27	PF 16 (P 16)	350-0015-000									
	35						001-0392-001	4,81											
	40						001-0393-001	5,60											
	45						001-0394-001	6,26											
	50						40	001-0396-001			6,93								
	55							001-0397-001			7,60								
	60							001-0398-001			8,26								
	65						50	001-0403-001			8,93								
	70							001-0405-001			9,59								
	75							001-0406-001			10,04								
	80						80	001-0407-001			10,93								
	85							001-0408-001			11,59								
	90							001-0409-001			12,26								
	100							001-0411-001			13,59								
	140							001-0421-001			18,92								
160	001-0427-001	21,58																	
M 20	40	7	18,38	24,5		15,5	001-0472-001	8,80	PF 20 (P 20 F)	350-0018-000									
	45						40	001-0473-001			9,85								
	50							001-0474-001			10,67								
	60							001-0476-001			12,97								
	65						50	001-0478-001			14,01								
	70							001-0480-001			15,05								
	80							001-0483-001			17,14								
	90						70	001-0485-001			18,82								
	100							001-0487-001			21,30								
	115							001-0490-001			24,42								
	120							001-0491-001			25,47								
	125							001-0492-001			26,51								
	M 24						50	10			22,05	30		30	001-0532-001	15,74	PF 24 (SN 22)	350-0023-000	
							55								50	001-0533-001			17,24
							60									001-0532-001			18,74
70		001-0536-001	21,2																
80		70	001-0538-001	24,74															
90			001-0540-001	27,73															
100			001-0542-001	30,73															
120		100	001-0543-001	36,73															
150			001-0552-001	45,72															

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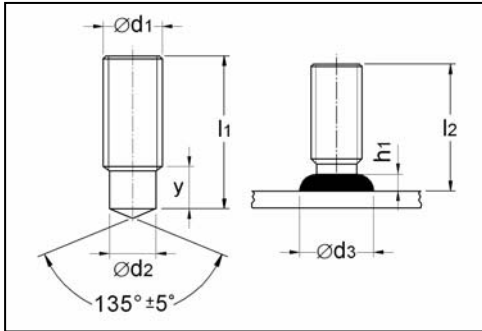
² Artikel-Nr. gilt für Stahl, Festigkeit 4.8, blank, andere Ausführungen siehe Tabelle Seite 1.

² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.



KOCO RD DIN EN ISO 13918
 Gewindebolzen mit reduziertem Schaft
 Threaded stud with reduced shaft
 Goujon fileté à tige réduite
 Espárrago roscado con eje reducido

mit/with/avec/con

 Bauregelliste (DIBT)

d ₁	l ₂	h ₁ ¹	d ₂	d ₃ ¹	y _{min}	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramikring Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago							
M 6	20	2,5	4,7	7	4	003-0028-001	0,34	RF 6 (SR 6)	350-0005-000							
	25					003-0029-001	0,43									
	30					003-0030-001	0,52									
	35					003-0031-001	0,60									
	40					003-0032-001	0,69									
	50					003-0034-001	0,87									
	60					003-0036-001	1,05									
M 8	20	2,5	6,2	9	4	003-0073-001	0,61	RF 8 (SR 8)	350-0007-000							
	25					003-0076-001	0,77									
	30					003-0078-001	0,93									
	35					003-0079-001	1,09									
	40					003-0080-001	1,25									
	45					003-0081-001	1,41									
	50					003-0082-001	1,57									
	55					003-0083-001	1,73									
	60					003-0084-001	1,89									
	80					003-0088-001	2,52									
	100					003-0092-001	3,16									
	M 10					20	3			7,9	11,5	5	003-0169-001	0,96	RF 10 (SR 10)	350-0009-000
						25							003-0172-001	1,21		
30		003-0173-001	1,46													
35		003-0174-001	1,72													
40		003-0176-001	1,97													
50		003-0178-001	2,47													
55		003-0179-001	2,72													
70		003-0182-001	3,48													
80		003-0184-001	3,98													
100		003-0188-001	5,01													
M 12		25	4	9,5	13,5	6		003-0262-001	1,74				RF 12 (SR 12)	350-0011-000		
	30	003-0263-001					2,11									
	35	003-0265-001					2,47									
	40	003-0266-001					2,83									
	45	003-0267-001					3,20									
	50	003-0268-001					3,56									
	60	003-0270-001					4,29									
	70	003-0272-001					5,02									
	80	003-0274-001					5,74									
	100	003-0278-001					7,20									

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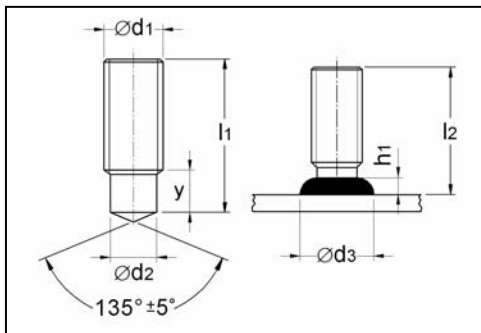
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² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.



KOCO RD DIN EN ISO 13918
 Gewindebolzen mit reduziertem Schaft
 Threaded stud with reduced shaft
 Goujon fileté à tige réduite
 Espárrago roscado con eje reducido

d ₁	l ₂	h ₁ ¹	d ₂	d ₃ ¹	y _{min}	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramikring Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago
M 16	30	6	13,2	18	11	003-1101-001	3,81	RF 16 (KR 16)	350-0015-000
	35					003-1102-001	4,48		
	40					003-1103-001	5,14		
	45					003-1104-001	5,81		
	50					003-1105-001	6,48		
	55					003-1106-001	7,14		
	60					003-1107-001	7,81		
	65					003-1108-001	8,47		
	70					003-1109-001	9,14		
	75					003-1110-001	9,81		
	80					003-1111-001	10,47		
	90					003-1113-001	11,80		
	100					003-1115-001	13,14		
	M 20					40	7		
45		003-0493-001	9,04						
50		003-0494-001	10,8						
60		003-0496-001	12,16						
65		003-0497-001	13,20						
70		003-0498-001	14,25						
80		003-0500-001	16,33						
90		003-0502-001	18,41						
100		003-0504-001	20,49						
M 24		50	10	20	28	15		003-0522-001	14,53
	55	003-0523-001					16,03		
	60	003-0524-001					17,53		
	70	003-0529-001					20,53		
	80	003-0521-001					23,52		
	90	003-0525-001					26,52		
	100	003-0301-001					29,52		

¹ h₁ und d₃ sind Richtwerte.

¹ h₁ and d₃ are approximate values.

¹ h₁ et d₃ sont des valeurs indicatives.

¹ h₁ y d₃ valores indicativos.

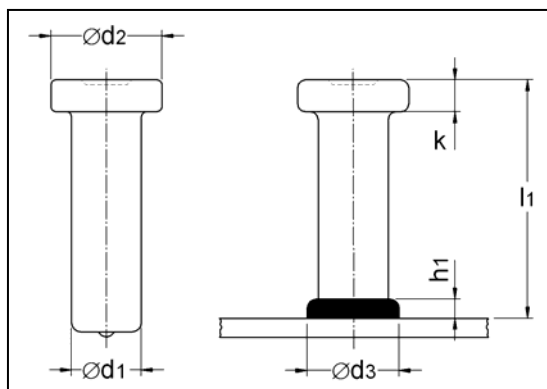
² Artikel-Nr. gilt für Stahl, Festigkeit 4.8, blank, andere Ausführungen siehe Tabelle Seite 1.

² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.


KÖCO SD DIN EN ISO 13918

Kopfbolzen
Shear connector
Connecteur d'ancrage
Conector de espiga

Für Stahleinbauteile gemäß Europäischer Technischer Zulassung ETA-03/0039 bzw. ETA-03/0040 (ab \varnothing 10 mm)
For steel components acc. to European Technical Approval ETA-03/0039 resp. ETA-03-0040 (from \varnothing 10 mm).

d_1	l_2	h_1^1	d_2	d_3^1	k	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramikring Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago
6	35	2,5	13	8,5	5	016-0005-001	1,23	UF 6 (SN 6)	350-0056-000
	50					016-0001-001	1,56		
	75					016-0003-001	2,12		
	100					016-0004-001	2,67		
10	30	2,5	19	13	7	016-0031-001	3,12	UF 10 (SN 10)	350-0164-000
	50					016-0033-001	4,36		
	75					016-0035-001	5,90		
	100					016-0038-001	7,44		
	125					016-0039-001	8,98		
	150					016-0040-001	10,52		
	175					016-0041-001	12,06		
12	30	3	25	17	8	016-0060-001	5,26	UF 12 (SN 12)	350-0164-000
13	25	3	25	17	8	016-0090-001	5,11	UF 13 (SN 13)	350-0059-000
	50					016-0091-001	7,72		
	75					016-0092-001	10,32		
	100					016-0095-001	12,93		
	125					016-0096-001	15,53		
	150					016-0098-001	18,14		
	175					016-0100-001	20,74		
	200					016-0101-001	23,35		
	225					016-0102-001	25,59		
	250					016-0104-001	28,56		
	300					016-0106-001	33,77		
	350					016-0350-001	38,98		
	400					016-0107-001	44,19		
	16					35	4,5		
50		016-0132-001	12,15						
75		016-0134-001	16,10						
100		016-0136-001	20,04						
125		016-0137-001	23,99						
150		016-0139-001	27,94						
175		016-0140-001	31,88						
200		016-0141-001	35,83						
225		016-0150-001	39,77						
250		016-0153-001	43,72						
275		016-0149-001	47,67						
300		016-0157-001	51,61						
350		016-0154-001	59,50						
400		016-0160-001	67,39						
525		016-0161-001	87,12						

¹ h_1 und d_3 sind Richtwerte.

¹ h_1 and d_3 are approximate values.

¹ h_1 et d_3 sont des valeurs indicatives.

¹ h_1 y d_3 valores indicativos.

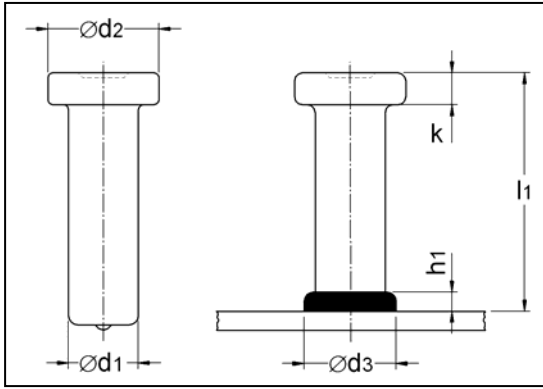
² Artikel-Nr. gilt für Stahl, Festigkeit 4.8, blank, andere Ausführungen siehe Tabelle Seite 1.

² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.



KOCO SD DIN EN ISO 13918
 Kopfbolzen
 Shear connector
 Connecteur d'ancrage
 Conector de espiga

mit/with/avec/con



Bauregelliste (DIBt)

Für Stahleinbauteile gemäß Europäischer Technischer Zulassung ETA-03/0039 bzw. ETA-03/0040 (ab Ø 10 mm)
 For steel components acc. to European Technical Approval ETA-03/0039 resp. ETA-03-0040 (from Ø 10 mm).

d ₁	l ₂	h ₁ ¹	d ₂	d ₃ ¹	k	Artikel-Nr. ² Part-no. No. d'article No. articulo	Masse Mass Poids Peso kg/100	Keramikring Ceramic ferrule Bague réfractaire Cerámica	Bolzenhalter Chuck Mandrin Porta espárrago
19	50	6	32	23	10	017-0001-001	16,11	UF 19 (SN 19)	350-0060-000
	75					017-0004-001	21,67		
	100					017-0007-001	27,23		
	125					017-0008-001	32,80		
	150					017-0010-001	38,36		
	175					017-0011-001	43,93		
	200					017-0012-001	49,49		
	225					017-0031-001	55,06		
	250					017-0079-001	60,62		
	275					017-0037-001	66,18		
	300					017-0079-001	71,75		
	350					017-0082-001	82,88		
	400					017-0032-001	94,01		
	525					017-0034-001	121,83		
22	75	6	35	13	10	017-0042-001	28,44	UF 22 (SN 22)	350-0061-000
	100					017-0044-001	35,90		
	125					017-0047-001	43,36		
	150					017-0048-001	50,82		
	175					017-0049-001	58,28		
	200					017-0050-001	65,74		
	225					017-0060-001	73,20		
	250					017-0058-001	80,66		
	300					017-0074-001	95,58		
	350					017-0101-001	110,50		
	400					017-0102-001	125,42		
	450					017-0105-001	140,34		
	525					017-0066-001	162,72		
	25					75	7		
100		017-0070-001	47,67						
125		017-0071-001	57,31						
150		017-0072-001	66,94						
175		017-0075-001	76,57						
200		017-0076-001	86,21						
225		017-0104-001	95,84						
250		017-0103-001	105,47						
300		017-0111-001	124,74						
350		017-0112-001	144,01						
400		017-0113-001	163,27						
450		017-0114-001	182,54						
525		017-0115-001	211,44						

¹ h₁ und d₃ sind Richtwerte.

¹ h₁ and d₃ are approximate values.

¹ h₁ et d₃ sont des valeurs indicatives.

¹ h₁ y d₃ valores indicativos.

² Artikel-Nr. gilt für Stahl, Festigkeit 4.8, blank, andere Ausführungen siehe Tabelle Seite 1.

² Part-no. applies to steel, grade 4.8, uncoated, other types see chart page 1.

² No. d'article valable pour acier, catégorie 4.8, sans revêtement, autres types voir tableau page 1.

Andere Abmessungen auf Anfrage. Other dimensions upon request.

Autres dimensions disponible sur demande Son posibles otras dimensiones bajo pedido.