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10/2007



**PFEIFER Waved Anchor DB 682
for permanent fixing**

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DR.-KARL-LENZ-STRASSE 66
87700 MEMMINGEN

TEL. Support +49 (0) 8331-937-184
Sales +49 (0) 8331-937-312

FAX +49 (0) 8331-937-342

E-MAIL export-bt@pfeifer.de

INTERNET www.pfeifer.de

PFEIFER Waved Anchor DB 682 for permanent fixing in long and short form

Item No. 05.260



PFEIFER

Fixing Systems
Permanent fixing

Waved Anchor DB 682 with General German Technical Approval No. Z-21.4-682 for fixing with predominant dead loads. The admissible anchoring forces can be calculated for each application individually using the guidelines for designing metal dowels for anchoring in concrete, Annex C.

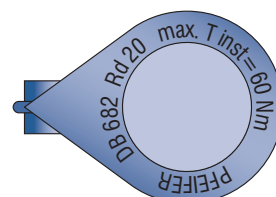
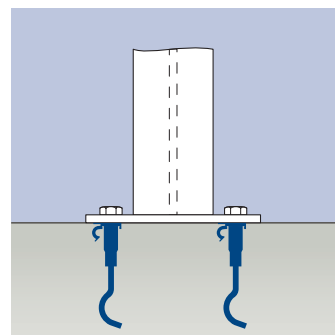
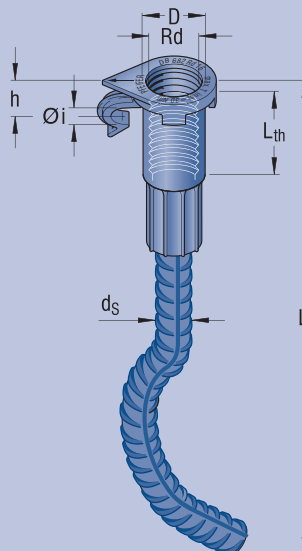
The anchor is supplied complete with sign clip.



Materials:

Socket: high grade precision steel tube, zinc-plated or stainless steel 1.4571, swaged on with waved bar

Sign clip: plastic



The sign clip, shown here in size Rd 20 is flush with the concrete surface and gives precise information as to the manufacturer, thread size and maximum tightening torque.

Reference No. zinc-plated	Reference No. stainless steel	Rd mm	L _{th} mm	d _s mm	D mm	h mm	i mm	L mm	Weight kg/100 pieces
Waved Anchor DB682, long form									
05.260.123.139	05.260.124.139	12 x 1,75	22	8	15,0	14,8	6,5	139	7,50
05.260.163.218	05.260.164.218	16 x 2,00	27	12	21,0	21,6	8,5	218	24,80
05.260.203.259	05.260.204.259	20 x 2,50	35	16	27,2	27,2	11,0	259	54,00
05.260.243.362	05.260.244.362	24 x 3,00	43	16	31,0	31,0	13,0	362	73,20
05.260.303.452	05.260.304.452	30 x 3,50	56	20	39,5	39,5	13,0	452	145,00
Waved Anchor DB682, short form									
05.260.123.110	05.260.124.110	12 x 1,75	22	8	15,0	14,8	6,5	110	6,50
05.260.163.174	05.260.164.174	16 x 2,00	27	12	21,0	21,6	8,5	174	20,50
05.260.203.194	05.260.204.194	20 x 2,50	35	16	27,2	27,2	11,0	194	49,00
05.260.243.252	05.260.244.252	24 x 3,00	43	16	31,0	31,0	13,0	252	60,00
05.260.303.302	05.260.304.302	30 x 3,50	56	20	39,5	39,5	13,0	302	100,00

Reference example for 500 Waved Anchors DB 682, long form, zinc-plated, Rd 12 with sign clip:
500 PFEIFER Waved Anchors DB 682 Reference No. 05.260.123.139

Register with the Construction Technology/Infoservice using www.pfeifer.de.
After the registration you can download the free calculation software.

Installation Instructions

PFEIFER Waved Anchor DB 682

long and short form



Please note:
These installation instructions are intended to provide relevant information. They cannot replace the text of the approval as this is more detailed. In case of doubt, the information contained in the approval shall apply. The text of the approval is to be used for planning!

1. Application options

The Waved Anchor DB 682 may be used for the anchoring of predominant dead loads. It must be installed in reinforced or non-reinforced normal concrete strength of at least C20/25.

The anchorings are to be designed in line with engineering practice. Proof of local load introduction is given in the approval; evidence of the load transmission in the structure

is to be provided by the responsible planner.

The Waved Anchor DB 682 with the zinc-plated socket is suitable for dry indoor areas. Typical applications are the anchoring of railings, machines, storage racking, installation rails, parapets, ceiling suspensions, prefabricated parts, anchor plates, face plates for steel supports and similar uses.

The Waved Anchor DB 682 with a stainless steel socket (1.4571) is suit-

able for damp areas and for use in the open air. Contact with salt- (chloride-) containing water must be avoided. Possible applications are façade anchorings, concrete parapets and the fixing of sliding framework, scaffolding and railings.

The Waved Anchor DB 682 is supplied complete with sign clip. The sign clip must be installed because it is possible to see the manufacturer, the size of the anchor and the maximum installation torque.

2. Design resistance

The design resistance is to be determined in accordance with the "Guidelines for the European Approval for anchoring metal dowels in concrete, Process A", individually for each installation and type of load. Single fixings, as well as group fixings with two or more anchors, can be proved by simply following the process described above.

The required parameters for the proof can be taken from the annexes to the approval.

The free calculation software is available in the download area of www.pfeifer.de

3. Required installation distances

Both minimum distances from the axis and the edge, as well as minimum construction element thickness as shown in Tables 1 and 2 for flat and face-side installation are governed by the Construction Approval. All further required distances can be found in the annexes to the approval. Fundamentally, flat installation (Fig. 1) and face-side installation (Fig. 2) must be differentiated. For both types of installation, the possibility exists to increase the design resistance force V_{Rd} , in particular for small edge distances, by installing a retention reinforcement.

Table 1: Flat installation

	Rd 12	Rd 16	Rd 20	Rd 24	Rd 30
minimum axis distance s_{min} [mm]	100	120	140	160	200
minimum edge distance c_{min} [mm]	50	60	70	80	100
short form					
Minimum thickness h_{min} [mm]	130	200	220	290	340
long form					
Minimum thickness h_{min} [mm]	160	240	280	400	490
short and long form					
computed anchoring depth h_{ef} [mm]	54	95	127	140	194

Table 2: Face-side installation (with retention reinforcement)

	Rd 12	Rd 16	Rd 20	Rd 24	Rd 30
minimum axis distance s_{min} [mm]	280	400	490	550	580
minimum edge distance $c_{min,V}$ [mm]	50	60	70	80	100
minimum edge distance $c_{min,H}$ [mm]	160	220	265	295	310
Minimum thickness h_{min} [mm]	100	120	140	160	200

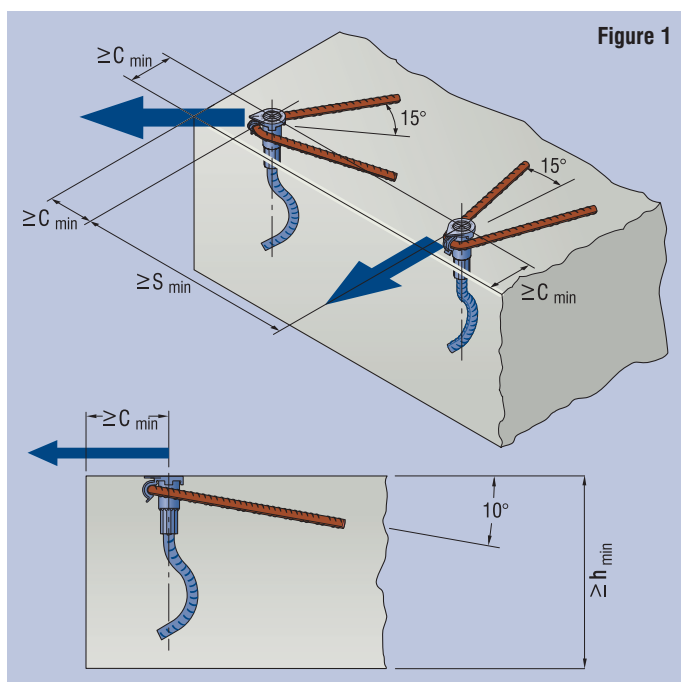


Figure 1

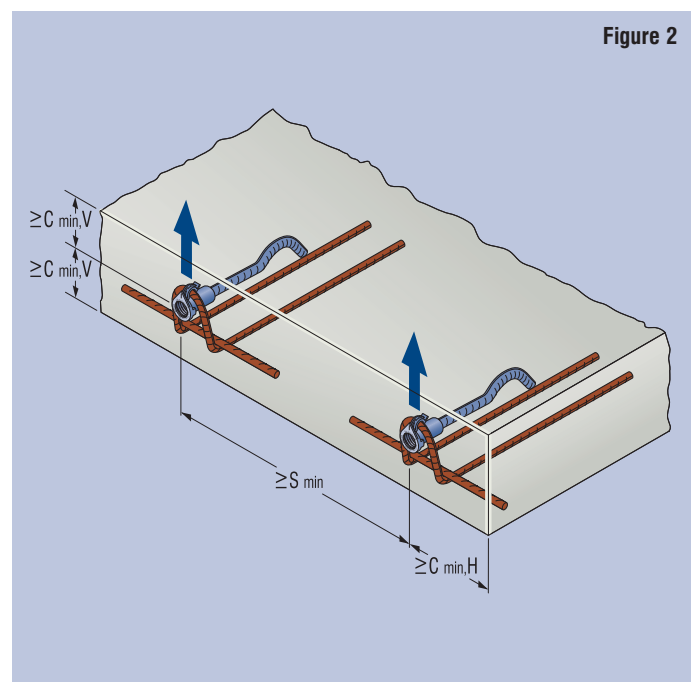


Figure 2

4. Retention reinforcement

For anchor installations with small edge distance, the concrete edge-fracture failure can be avoided by installing a special retention reinforcement, in which the proof of the effect is assigned entirely to this reinforcement. The required dimensions for the relevant version of reinforcement are given in Figs. 3 and 4 and Tables 3 and 4. The associated design resistance must be taken from the approval.

The retention reinforcement can be fixed directly to the socket with the aid of the sign clip. In the event that the Waved Anchor is not to be used in dry indoor areas as per section 1.2, a retention reinforcement made from non-corroding steel BSt 500 NR with General Construction Approval should be used.

Table 3: Retention reinforcement for flat installation

	Rd 12	Rd 16	Rd 20	Rd 24	Rd 30
Retention reinforcement BSt 500 S (B) or BSt 500 NR \varnothing_{s_1} [mm]	6	8	10	12	12
Anchoring length or retention reinforcement L_{VR} [mm]	330	440	550	660	660
Deflection radius d_{Br} [mm]	24	32	40	48	48
Splay angle α [°]	30	30	30	30	30

Table 4: Retention reinforcement for face-side installation

	Rd 12	Rd 16	Rd 20	Rd 24	Rd 30
Retention reinforcement BSt 500 S (B) or BSt 500 NR \varnothing_{s_1} [mm]	6	8	10	12	12
Transverse bar BSt 500 S (B) or BSt 500 NR \varnothing_{s_2} [mm]	8	12	14	14	16
Anchoring length of retention reinforcement L_{VR} [mm]	270	420	490	520	570
Length of transverse bar L_Q [mm]	280	400	490	550	580
Total height H [mm]	40	55	70	80	105
Deflection radius d_{Br} [mm]	24	32	40	48	48
Angle of bend α [°]	15	15	15	15	15

5. System accessories

The Waved Anchor DB 682 with the sign clip (Fig. 5) must always be cast in concrete flush with the surface. Suitable recessing accessories, as shown in Fig. 6, can be found at PFEIFER Threaded Systems, Register 2 of the PFEIFER File.

6. Mounting the fixing components

After stripping the form and removing the recessing accessories, the part to be fixed can be installed in place with a screw (5.6, 8.8, A4-50 or A4-70). The screw must be selected according to engineering practice.

The maximum installation torque $T_{inst,max}$ and the minimum and maximum screw-in depths must be complied with.

Table 5: Mounting parameters

Thread	Screw-in depth* [mm]		Maximum installation torque [Nm]
	min	max	
12 x 1,75	19	24	≤ 10
16 x 2,00	23	29	≤ 30
20 x 2,50	29	37	≤ 60
24 x 3,00	33	45	≤ 80
30 x 3,50	39	58	≤ 200

* from the upper edge (sign clip)

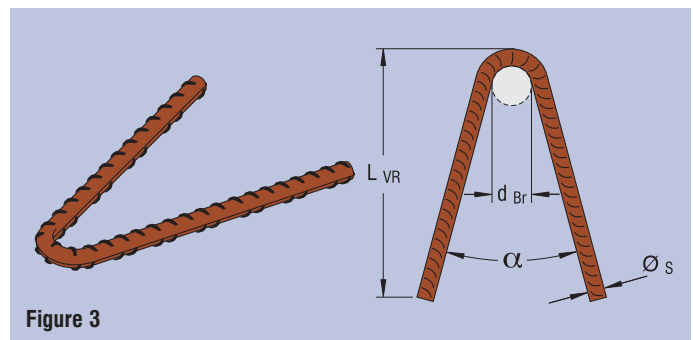


Figure 3

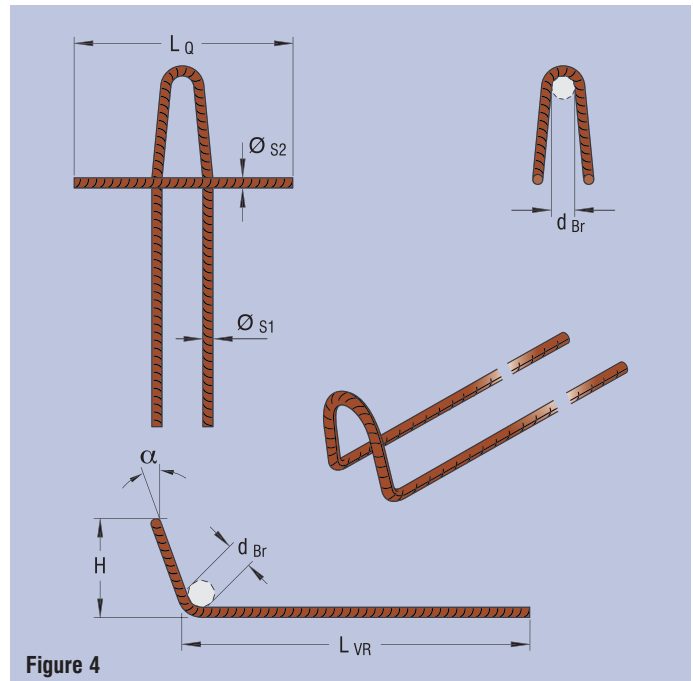


Figure 4

The sign clip gives information as to the manufacturer, thread size and maximum installation torque, E.g. Rd 30

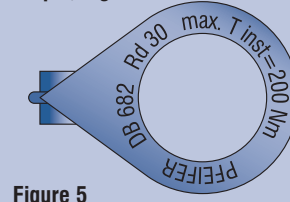


Figure 5

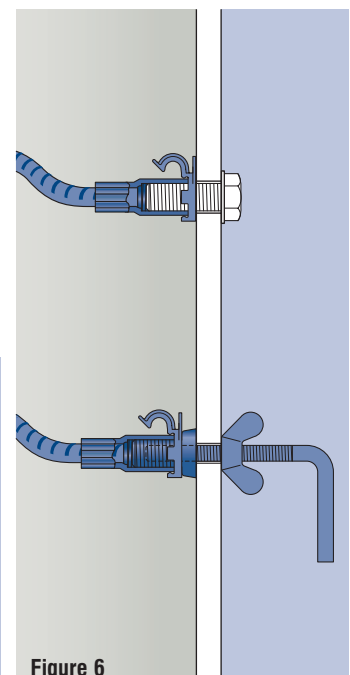


Figure 6

The new PFEIFER sign clip

The new PFEIFER sign clip gives not only the thread size and the tightening torque but also the transverse force direction defined by the planners. A prerequisite is an instruction from the responsible planner for correct use of the clip. If a transverse- or angled-tension reinforcement is used, the correct use of the clip is already guaranteed by the correct hanging of the reinforcement. But even without additional reinforcement the correct use of the clip should be included in the plans, in order to avoid incorrect use.

For fixing with straight tension only, or for sufficient edge distances, the arrow is of no significance to the user.



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Waved Anchor DB 682
for Permanent Fixings



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PFEIFER SEIL- UND
HEBETECHNIK GMBH
Dr.-Karl-Lenz-Strasse 66
D-87700 MEMMINGEN
Telefon +49 (0)8331-937-312
Telefax +49 (0)8331-937-342
E-Mail export-bt@pfeifer.de
Internet www.pfeifer.de

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Nobelstraße 51-55
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Am Güterbahnhof 20
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Fax 07742-9215-90
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Internet www.h-bau.de

Stettiner Straße 20
30916 ISERNHAGEN/Hannover
Tel. 0511-61779
Fax 0511-614604
E-Mail jp-hannover@pfeifer.de

Oeseder Straße 115
D-49124 GEORGSMARIENHÜTTE/
Osnabrück
Tel. 05401-871544
Fax 05401-871540
E-Mail jp-osnabrueck@pfeifer.de

Fundlandstraße 29
D-45326 ESSEN
Tel. 0201-28966-0
Fax 0201-28966-20
E-Mail jp-essen@pfeifer.de

Zum Wiesengrund 2
D-01723 KESSELSORF/Dresden
Tel. 035204-215-11
Fax 035204-215-18
E-Mail jp-dresden@pfeifer.de

Markircher Straße 14
D-68229 MANNHEIM
Tel. 0621-4840340
Fax 0621-4840344
E-Mail jp-mannheim@pfeifer.de

Lechstraße 21
D-90451 NÜRNBERG
Tel. 0911-6427808
Fax 0911-6428472
E-Mail jp-nuernberg@pfeifer.de

Hölderlinstraße 23
D-75446 WIERNESHEIM/Stuttgart
Tel. 07041-860858
Fax 07041-2239
E-Mail jp-stuttgart@pfeifer.de

in Denmark

J&P BYGGETEKNIK A/S
Risgårdvej 66, Risgård
DK-9640 FARSØ
Tel. +45-9863-1900
Fax +45-9863-1939
E-Mail info@jordahl-pfeifer.dk

in Austria

GHL Bautechnik
Produktions- und Handels GmbH
Caracallastraße 16
A-4470 ENNS
Tel. +43-7223-81919-0
Fax +43-7223-81919-33
E-Mail office@ghl-bau.at

in Switzerland

ANKABA Ankertechnik und Bauhandel AG
Zürichstr. 38a
CH-8306 BRÜTTISELLEN
Tel. +41-44-8071717
Fax +41-44-8071718
E-Mail info@ankaba.ch

in Czechia

J&P STAVEBNÍ TECHNIKA s.r.o.
Prumyslová 5
CZ-10821 PRAHA 10
Tel. +420-272700701
Fax +420-272703737
E-Mail info@jpcz.cz

in Poland

J&P TECHNIKA BUDOWLANA Sp. z o.o.
ul. Wroclawska 68
PL-55-330 KREPICE k/Wroclawia
Tel. +48-71-3968264
Fax +48-71-3968105
E-Mail biuro@jordahl-pfeifer.com.pl

in Hungary

PFEIFER GARANT Kft.
Gyömrői út 128
HU-1103 BUDAPEST
Tel. +36-1-2601014
Fax +36-1-2620927
E-Mail info@pfeifer-garant.hu

in Singapore

J&P BUILDING SYSTEMS PTE LTD.
No. 48 Toh Guan Road East
#08-104 Enterprise Hub
SG-SINGAPORE 608586
Tel. +65-6569-6131
Fax +65-6569-5286
E-Mail jandpsgp@singnet.com.sg

in the UAE

Emirates German Building Materials
Trading (LLC)
Al Quasais Ind. Area –
4, Beirut St.
UAE-DUBAI
Tel. +971-4-2676644
Fax +971-4-2676646
E-Mail gemirate@emirates.net.ae

in Spain

J&P TÉCNICAS DE ANCLAJE S.L.
Avda. de los Pirineos, 25 – Nave 20
San Sebastián de los Reyes
ES-28700 MADRID
Tel. +34-916593185
Fax +34-916593139
E-Mail jp@jp-anclajes.com

ES-08820 BARCELONA
Tel. +34-93-3741030
Fax +34-93-3741459

in the United Kingdom/Ireland

J&P BUILDING SYSTEMS Ltd.
Unit 5 Thame Forty
Jane Morbey Road
GB-THAME, OXON OX9 3RR
Tel. +44-1844-215200
Fax +44-1844-263257
E-Mail enquiries@jandpbuildingsystems.com

in Russia

000 PFEIFER
KANATI & PODJÖMNIJE TEHNOLOGII
RU-111141 MOSCOW
3rd proezd Perova Polya, 8
Tel. +7-495-505-74-94
Fax +7-495-363-00-73
E-Mail info@pfeiferrussia.ru

ST. PETERSBURG
Tel. +7-812-740-12-24
Fax +7-812-740-12-24

in Romania

S.C. JORDAHL & PFEIFER
TEHNICĂ DE ANCORARE S.R.L.
str. Malului nr. 7 Et. 1
RO-550197 Sibiu jud. Sibiu
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PFEIFER Socket Dowel with cross hole

Item-No. 05.254



PFEIFER

Fixing System

Socket Dowels

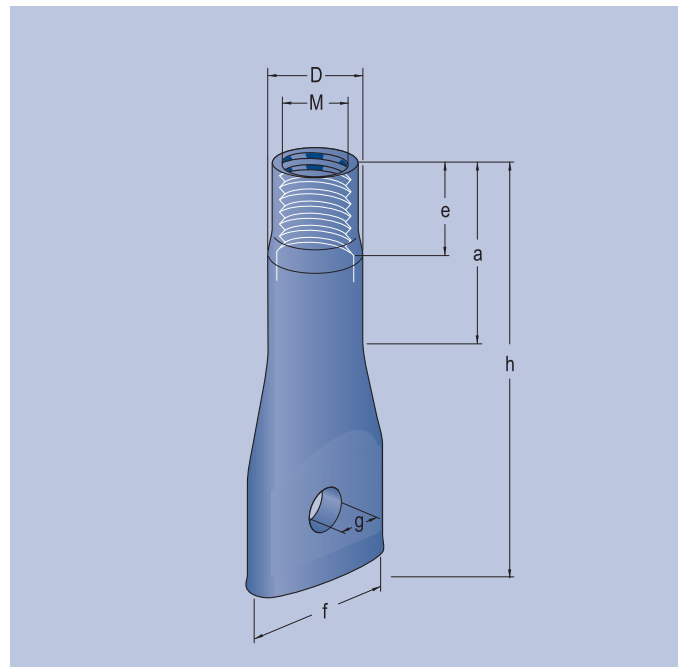
We recommend Socket Dowels only for fixings, for which a general technical approval is not necessary.

A reinforcement bar has to be inserted through the cross hole thus a safe transmission of the static forces into the concrete is guaranteed.

Load capacity specified (in axial direction) is calculated for concrete compressive strength of 25 N/mm².

Material:

M 6 – M 12
DIN 2394, St 34-2 NBK
M 16 – M 30
DIN 1626, St 33/37-2
Stainless steel 1.4571



Minimal tolerances from the dimension specifications are possible. They will not influence the load capacity.

Ref. No. black/plain	Ref. No. zinc-plated	Ref. No. stainless steel	Load capacity t	adm. F kN	Size M x h	Dimensions mm					Packing- unit pieces	Weight approx. kg/packing unit
						a	e	f	g	D		
–	05.254.063.040	–	0,15	1,5	6 x 40	25	6	12,5	6,2	8,5	500	3,5
–	05.254.083.040	–	0,20	2,0	8 x 40	25	8	16,0	6,2	10,5	500	4,5
–	05.254.083.050	05.254.084.050	0,25	2,5	8 x 50	25	8	16,0	6,2	10,5	500	5,5
–	05.254.103.050	–	0,35	3,5	10 x 50	24	10	20,0	6,2	13,5	500	10,0
–	–	05.254.104.050	0,35	3,5	10 x 50	24	10	20,0	6,2	13,5	100	2,3
–	05.254.123.060	–	0,50	5,0	12 x 60	25	12	24,5	7,2	17,0	400	16,8
–	–	05.254.124.060	0,50	5,0	12 x 60	25	12	25,0	7,2	17,0	100	3,3
–	05.254.123.070	–	0,60	6,0	12 x 70	30	12	24,5	7,2	17,0	400	19,6
05.254.162.070	05.254.163.070	–	0,70	7,0	16 x 70	25	16	30,5	9,2	21,3	200	18,2
05.254.162.080	05.254.163.080	–	0,80	8,0	16 x 80	25	16	30,0	12,2	21,3	200	20,4
–	–	05.254.164.080	0,80	8,0	16 x 80	25	16	31,0	12,2	21,3	50	5,0
05.254.162.100	05.254.163.100	–	1,00	10,0	16 x 100	32	16	30,5	9,2	21,3	100	13,4
05.254.162.120	05.254.163.120	–	1,20	12,0	16 x 120	32	16	30,5	12,2	21,3	100	15,7
05.254.202.100	05.254.203.100	–	1,25	12,5	20 x 100	40	20	38,5	12,2	26,9	100	16,5
–	–	05.254.204.100	1,25	12,5	20 x 100	40	20	39,0	12,2	26,9	25	3,8
05.254.202.120	05.254.203.120	–	1,40	14,0	20 x 120	40	20	38,5	14,2	26,9	100	21,0
05.254.242.120	05.254.243.120	–	1,80	18,0	24 x 120	50	24	48,0	14,2	33,7	50	16,7
05.254.302.150	05.254.303.150	–	2,75	27,5	30 x 150	70	30	64,0	15,2	42,0	25	13,8

Sample order: 200 PFEIFER Socket Dowel with cross hole, plain, M 16 x 80 mm:
200 PFEIFER Socket Dowel ref. no. 05.254.162.080

Instructions for PFEIFER Socket Dowels with cross hole

1. Installation

To be able to transfer forces into the concrete a reinforcement bar is put through the cross hole. The largest bar diameter should be chosen that passes through the cross hole. The socket dowel can be nailed to the formwork by PFEIFER Nail Disc or with a hexagonal bolt bolted through a hole in the formwork.

2. Straight pull

To avoid premature failure of the Socket Dowel caused by blow-out of the concrete under straight pull, the socket dowel has to be a minimum edge distance. Table 1 and figure 1 show the minimum values for a hardened concrete with a compressive strength of 25 N/mm².

Table 1 – edge distance for axial pull

Size mm x mm	adm. F_z kN	min a_r (Z) mm
M 6 x 40	1,5	60
M 8 x 40	2,0	60
M 8 x 50	2,5	75
M 10 x 50	3,5	75
M 12 x 60	5,0	90
M 12 x 70	6,0	105
M 16 x 70	7,0	105
M 16 x 80	8,0	120
M 16 x 100	10,0	150
M 16 x 120	12,0	180
M 20 x 100	12,5	150
M 20 x 120	14,0	180
M 24 x 120	18,0	180
M 30 x 150	27,5	225

3. Transversal pull

If the Socket Dowel is exposed to shear forces (vertically to the longitudinal axis of the Socket Dowel) in the direction of the free edge, there is danger of concrete blow-out. To make sure the forces are transferred properly to the concrete certain minimum edge distances (a_r) and minimum thickness of panel (d) should be kept. Therefore see table 2 and figure 2. Greater concrete cover may result in thicker precast concrete panels.

Table 2 – edge distance, thickness of the panels under shear forces

Size mm x mm	adm. F_Q kN	min a_r (Q) mm	min d mm
M 6 x 40	1,5	80	65
M 8 x 40	2,0	80	65
M 8 x 50	2,5	100	75
M 10 x 50	3,5	100	75
M 12 x 60	5,0	120	85
M 12 x 70	6,0	140	95
M 16 x 70	7,0	140	95
M 16 x 80	8,0	160	105
M 16 x 100	10,0	200	125
M 16 x 120	12,0	240	145
M 20 x 100	12,5	200	125
M 20 x 120	14,0	240	145
M 24 x 120	18,0	240	145
M 30 x 150	27,5	300	175

Figure 1

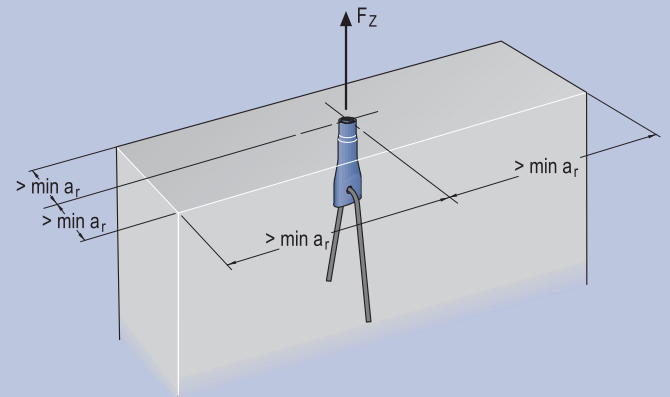
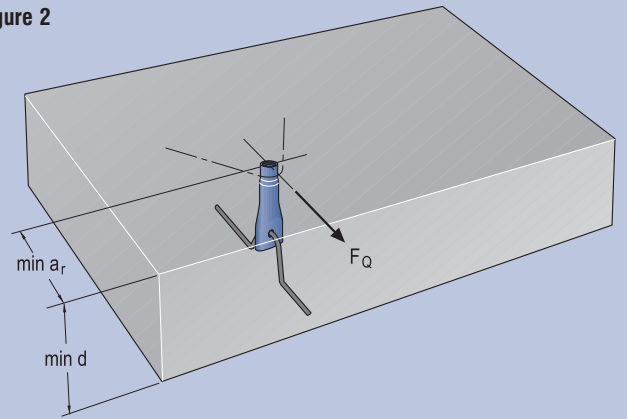


Figure 2



4. Parallel shear force (interaction)

We speak of shear force if there is straight pull and angular shear simultaneously working on the Socket Dowel. Their force components should be calculated according to the following formula:

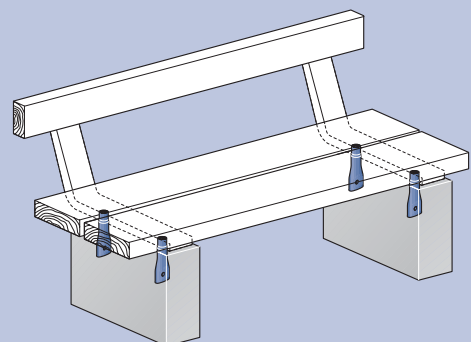
$$CDP_{20} \cdot F_Q^2 \leq \text{adm } F$$

This means for an angle of inclination of 90° the same admissible force is valid.

5. Example of application

In figure 3 we show a typical example of an application of PFEIFER Socket Dowels: bench consoles fixed with Socket Dowels to a foundation.

Figure 3



PFEIFER Socket Dowel with cross hole and nail plate

Item-No. 05.258

We recommend Socket Dowels
only for fixings, for which a general
technical approval is not necessary.



PFEIFER

Fixing System
Socket Dowels

Through the nailing plate the PFEIFER Socket Dowels can be nailed to wooden formwork.

A reinforcement bar has to be inserted through the cross hole thus a safe transmission of the static forces into the concrete is guaranteed.

Load capacity specified (in axial direction) is calculated for concrete compressive strength of 25 N/mm².

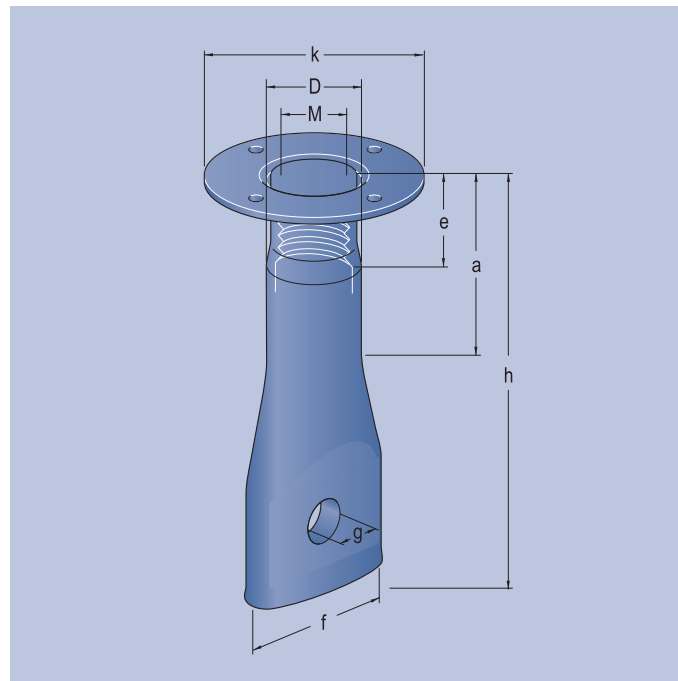
Werkstoff:

M 8 – M 12

DIN 2394, St 34-2

M 16 – M 20

DIN 1626, St 33/37-2a



Minimal tolerances for the dimension specifications are possible. They will not influence the load capacity.

Ref. No. black/plain	Ref. No. zinc-plated	Load capacity t	adm. F kN	Size M x h	Dimensions mm						Packing unit pieces	Weight approx. kg/packing unit
					a	e	f	g	K	D		
–	05.258.103.050	0,35	3,5	10 x 50	24	10	20	6,2	34	13,5	200	5,6
–	05.258.123.070	0,60	6,0	12 x 70	30	12	25	7,2	40	17,0	200	12,4
05.258.162.100	05.258.163.100	1,00	10,0	16 x 100	32	16	30	9,2	44	21,3	100	14,6
05.258.202.100	05.258.203.100	1,25	12,5	20 x 100	40	20	39	12,2	48	26,9	100	18,0

Sample order:

200 PFEIFER Socket Dowels with cross hole and nail plate, zinc-plated, M 12 x 70 mm:

200 PFEIFER Socket Dowels ref. no. 05.258.123.070

Instructions for PFEIFER Socket Dowels with cross hole and nail plate

1. Installation

To be able to transfer forces into the concrete a reinforcement bar is put through the cross hole. The largest bar diameter should be chosen that passes through the cross hole. Fixation of the Socket Dowel can be done by nailing the nailing plate to the wooden formwork. Also by means of a hexagonal bolt and a drilled hole through the formwork the Socket Dowel can be fixed.

2. Straight pull

To avoid premature failure of the Socket Dowel caused by blow-out of the concrete under straight pull the Socket Dowel has to be a minimum edge distance from the corners of any precast concrete panel.

Table 1 – Edge distance at axial pull

Size mm x mm	adm. F_z kN	min a_r (Z) mm
M 10 x 50	3,5	75
M 12 x 70	6,0	105
M 16 x 100	10,0	150
M 20 x 100	12,5	150

3. Transversal pull

If the Socket Dowel is exposed to shear forces (angular to the longitudinal axis of the Socket Dowel) in the direction of the free edge there is danger of concrete blow-out. To make sure the forces are transferred properly to the concrete certain minimum edge distance (a_r) and minimum thickness of panel (d) should be kept. Therefore see table 2 and figure 2. Greater concrete cover may result in thicker precast concrete panels.

Table 2 – Edge distance, thickness of the panel under shear forces

Size mm x mm	adm. F_Q kN	min a_r (Q) mm	min d mm
M 10 x 50	3,5	100	75
M 12 x 70	6,0	140	95
M 16 x 100	10,0	200	125
M 20 x 100	12,5	200	125

4. Parallel shear force (interaction)

We speak of shear force if there is straight pull and angular shear simultaneously working on the socket dowel. Their force components should be calculated according to the following formula:

$$\sqrt{F_z^2 + F_Q^2} \leq \text{adm. } F$$

This means for an angle of inclination of 0 to 90° the same admissible force is valid.

5. Example of application

In figure 3 we show a typical example for the use of PFEIFER Socket Dowels: staircase fixed to a precast concrete panel.

Figure 1

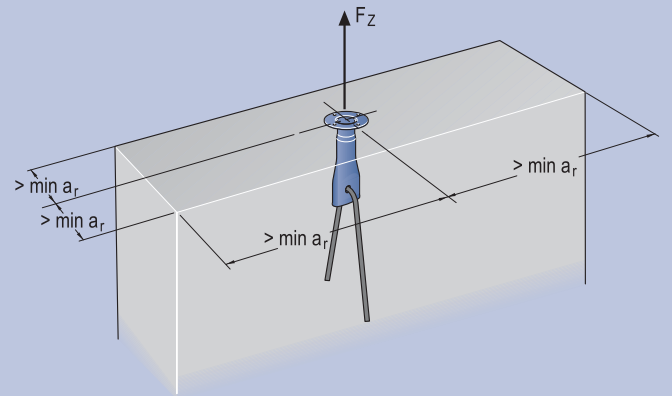


Figure 2

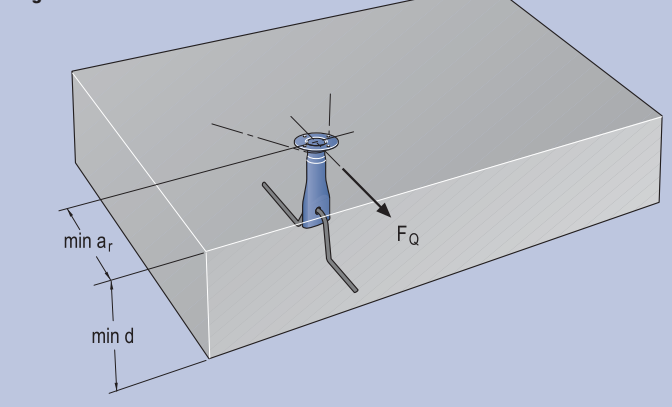
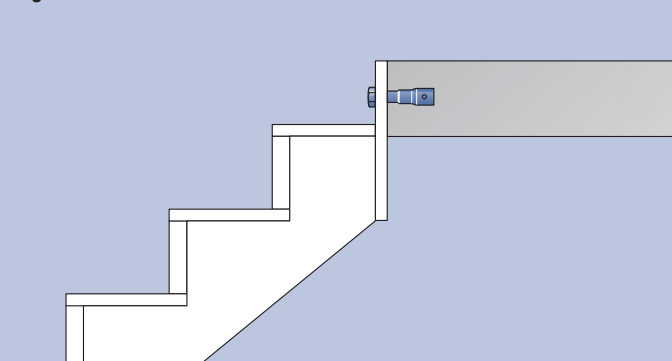


Figure 3



PFEIFER Socket Dowel with crimped end

Item-No. 05.250

We recommend Socket Dowels only for fixings, for which a general technical approval is not necessary.



PFEIFER

Fixing System

Socket Dowels

Fixing Sockets with crimped end give proof of excellent loading capacities in the most varied fields of application. The crimped end of the Socket Dowel transfers the force into the concrete by form closure.

The load bearing capacity specified is calculated with a safety factor of $\gamma \geq 5$ and for concrete strength of 25 N/mm^2 .

Material:

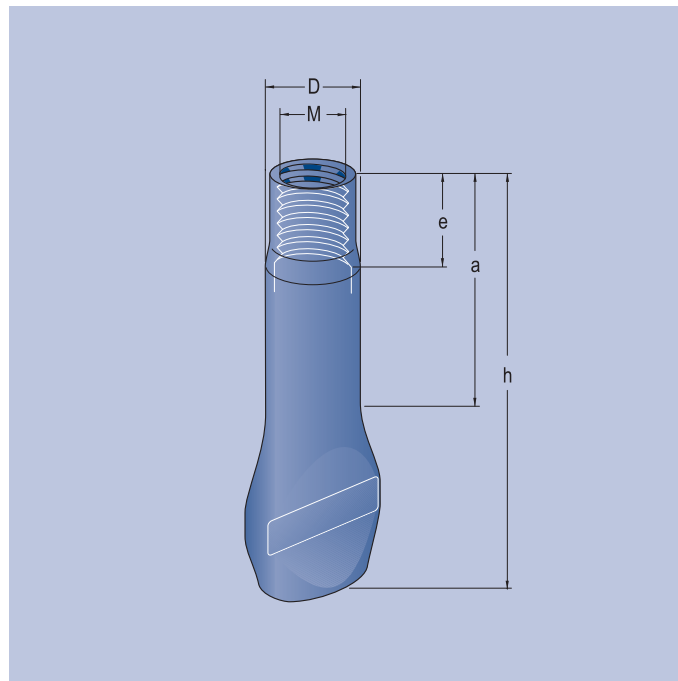
M 10 – M 12

DIN 2394, St 34-2 NBK

M 16 – M 24

DIN 1626, St 33/37-2

Stainless steel 1.4571



Minimal tolerances from the dimension specifications are possible. They will not influence the load capacity.

Ref. No. black/plain	Ref. No. zinc-plated	Ref. No. stainless steel	Load capacity t	adm. F kN	Size M x h	Dimensions mm			Packing unit pieces	Weight approx. kg/packing unit
						a	e	D		
–	–	05.250.064.040	0,15	1,5	6 x 40	25	6	8,5	200	1,6
–	05.250.103.050	–	0,32	3,2	10 x 50	25	10	13,5	500	10,0
–	05.250.103.060	–	0,40	4,0	10 x 60	30	10	13,5	500	12,5
–	05.250.123.050	–	0,40	4,0	12 x 50	30	12	13,5	400	14,4
–	05.250.123.070	–	0,60	6,0	12 x 70	40	12	17,0	400	21,2
05.250.162.100	05.250.163.100	–	1,00	10,0	16 x 100	50	16	21,3	100	11,5
05.250.202.100	05.250.203.100	–	1,25	12,5	20 x 100	50	20	26,9	100	15,1
05.250.242.100	05.250.243.100	–	1,60	16,0	24 x 100	40	24	33,7	50	13,5

Sample order:

200 PFEIFER Socket Dowels with crimped end, plain, M 16 x 100 mm:

200 PFEIFER Socket Dowels ref. no. 05.250.162.100

Installation instructions for PFEIFER Socket Dowels with crimped end

1. Installation

The Socket Dowel can be fixed to the formwork with the PFEIFER Nail Disc or it can be screwed through the formwork with a hexagonal screw. Forces are transferred by form closure. No further reinforcement is necessary. The crimped end can differ from the shape shown overleaf without the load capacity being affected.

2. Straight pull

In order to avoid premature failure of the Socket Dowel caused by blow-out of the concrete under straight pull, a certain minimum edge distance has to be considered. Table 1 and Figure 1 show the minimum values for concrete with a compressive strength of 25 N/mm².

Table 1 – Edge distance under straight pull

Size mm x mm	adm. F _Z kN	min a _r (Z) mm
M 6 x 40	1,5	60
M 10 x 50	3,2	75
M 10 x 60	4,0	90
M 12 x 50	4,0	75
M 12 x 70	6,0	105
M 16 x 100	10,0	150
M 20 x 100	12,5	150
M 24 x 100	16,0	150

3. Transversal pull loads

If there is exposure to transversal pull (vertically to the longitudinal axis of the Socket Dowel) in the direction of the free edge, there is danger of concrete blow-out. To make sure the forces are transferred properly, certain minimum edge distances (a_r) and minimum thickness of panel d should be considered. See Table 2 and Figure 2. Greater concrete cover may result in thicker precast concrete panels.

Table 2 – Edge distance, thickness of panel under transversal pull

Size mm x mm	adm. F _Q kN	min a _r (Q) mm	min d mm
M 6 x 40	1,5	80	65
M 10 x 50	3,2	90	70
M 10 x 60	4,0	120	85
M 12 x 50	4,0	100	75
M 12 x 70	6,0	140	95
M 16 x 100	10,0	200	125
M 20 x 100	12,5	200	125
M 24 x 100	16,0	200	125

4. Parallel shear pull (interaction)

We speak of parallel shear pull if there is straight pull and transversal pull simultaneously working on the Socket Dowel. The force components should fulfil the following formula:

$$- F_Z^2 + F_Q^2 \leq \text{adm. } F$$

This means, simply explained, for an angle of inclination from 0° to 90° the same admissible force is valid.

5. Example of application

In Figure 3 a typical example for the proper use of PFEIFER Fixing Sockets is shown: Attachment of an installation bracket.

Figure 1

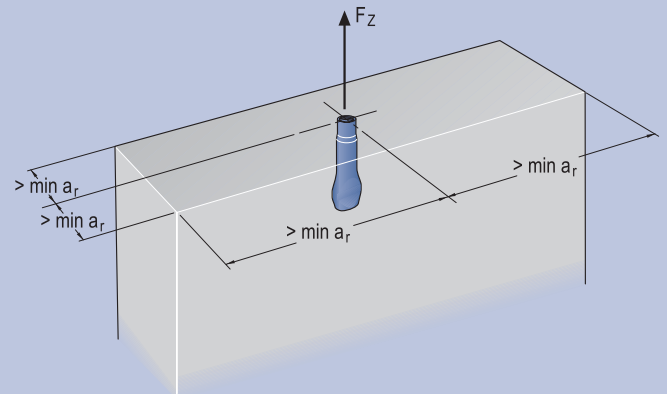


Figure 2

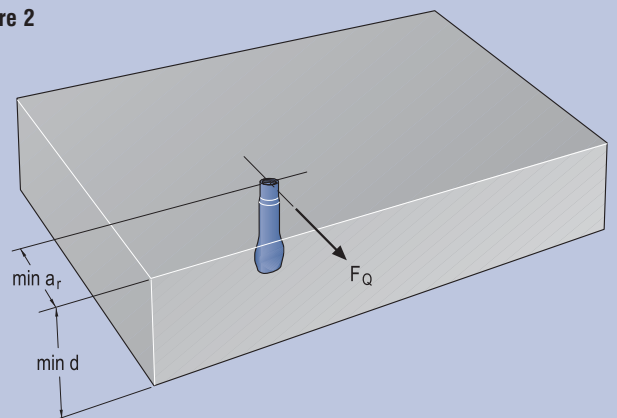
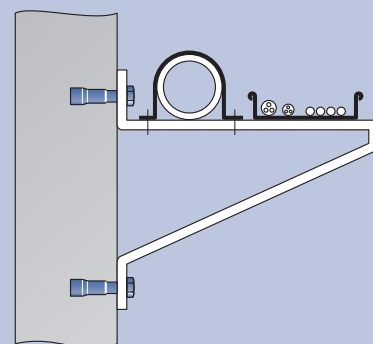


Figure 3



PFEIFER Socket Dowel with crimped end and nail plate

Item-No. 05.252

We recommend Socket Dowels
only for fixings, for which a
general technical approval is not
necessary.



PFEIFER

Fixing System
Socket Dowels

PFEIFER Socket Dowels can be attached to wooden formwork simply and efficiently using the nail plate.

The crimped end of the PFEIFER Socket Dowel transfers the forces safely into the concrete by form closure. The values are valid for concrete with compressive strength of 25 N/mm².

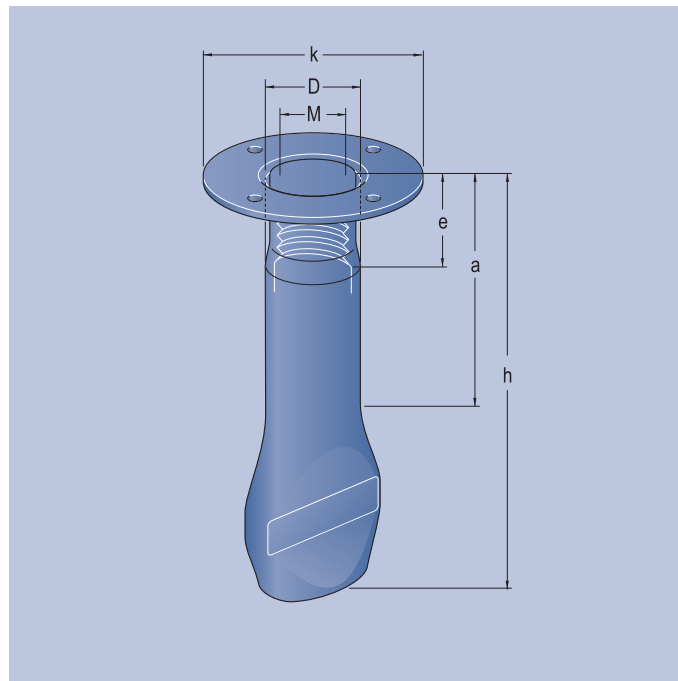
Material:

M 10 – M 12

DIN 2394, St 34-2

M 16 – M 24

DIN 1626, St 33/37-2



Minimal tolerances from the dimension specifications are possible and do not affect the load capacity.

Ref. No. black/plain	Ref No. zinc-plated	Load capacity t	adm. F kN	Size M x h	Dimensions mm				Packing unit piece	Weight approx kg/packing unit
					a	e	k	D		
–	05.252.103.060	0,40	4,0	10 x 60	40	10	34	13,5	200	6,4
–	05.252.123.070	0,60	6,0	12 x 70	40	12	40	17,0	200	12,8
05.252.162.100	05.252.163.100	1,00	10,0	16 x 100	50	16	44	21,3	100	12,9
05.252.202.100	05.252.203.100	1,25	12,5	20 x 100	50	20	48	26,9	100	16,6
05.252.242.100	05.252.243.100	1,60	16,0	24 x 100	40	24	57	33,7	50	14,3

Sample order:

200 PFEIFER Socket Dowels with crimped end and nail plate, zinc-plated M 12 x 70 mm:

200 PFEIFER Socket Dowels ref. no. 05.252.123.070

Installation instructions for PFEIFER Socket Dowel with crimped end and nail plate

1. Installation

The Socket Dowel with crimped end and nail plate can be nailed directly to the formwork. Alternatively, it can be screwed onto the formwork with a hexagonal screw. No further reinforcement is necessary.

2. Straight pull

In order to avoid premature failure of the Socket Dowel caused by blow-out of the concrete under straight pull, a certain minimum edge distance has to be considered. Table 1 and Figure 1 show the minimum values for concrete with a compressive strength of 25 N/mm².

Table 1 – Edge distance under straight pull

Size mm x mm	adm. F _Z kN	min a _r (Z) mm
M 10 x 60	4,0	90
M 12 x 70	6,0	105
M 16 x 100	10,0	150
M 20 x 100	12,5	150
M 24 x 100	16,0	150

3. Transversal pull load

If there is exposure to transversal pull (vertically to the longitudinal axis of the Socket Dowel) in the direction of the free edge, there is danger of concrete blow-out. To make sure the forces are transferred properly, certain minimum edge distances (a_r) and minimum thickness of panel d should be considered. See Table 2 and Figure 2. Greater concrete cover may result in thicker precast concrete panels.

Table 2 – Edge distance, thickness of panel under transversal pull

Size mm x mm	adm. F _Q kN	min a _r (Q) mm	min d mm
M 10 x 60	4,0	120	85
M 12 x 70	6,0	140	95
M 16 x 100	10,0	200	125
M 20 x 100	12,5	200	125
M 24 x 100	16,0	200	125

4. Parallel shear force (interaction)

We speak of parallel shear pull if there is straight pull and transversal pull simultaneously working on the Socket Dowel. The force components should fulfil the following formula:

$$- F_Z^2 + F_Q^2 \leq \text{adm } F$$

This means for an angle of inclination from 0° to 90° the same admissible force is valid.

5. Example of application

In Figure 3 a typical example for the proper use of PFEIFER Fixing Sockets is shown: Attachment of machines to foundations.

Figure 1

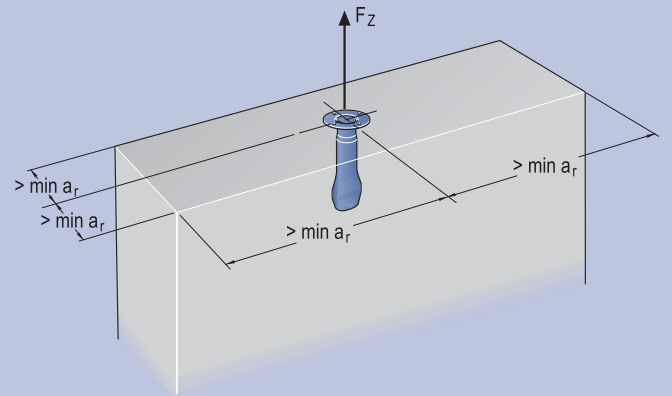


Figure 2

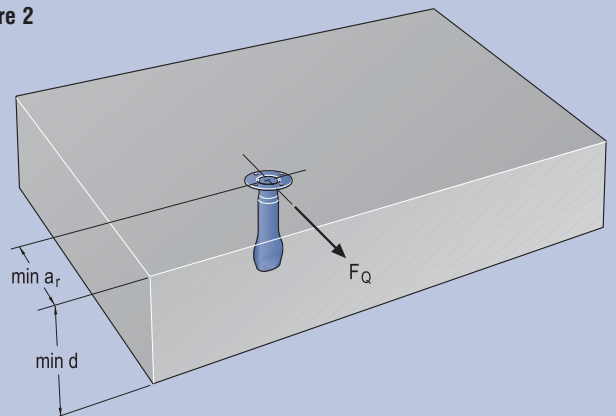
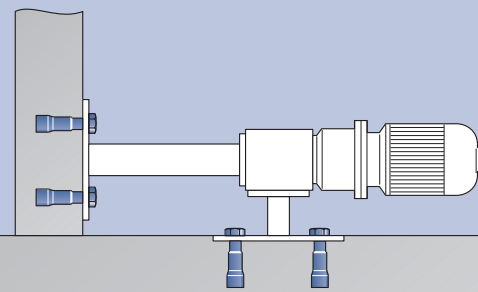


Figure 3



PFEIFER Socket Dowel with angular end

Item-No. 05.256

We recommend Socket Dowels only for fixings, for which a general technical approval is not necessary.



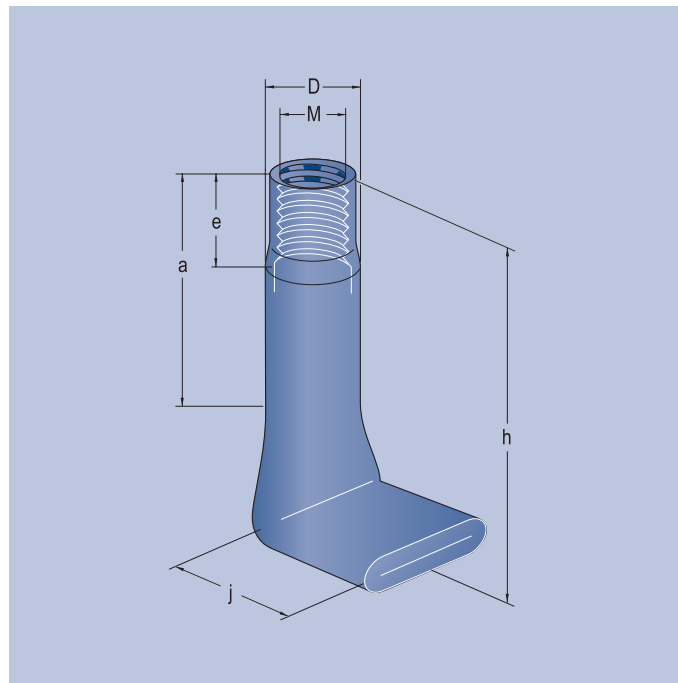
PFEIFER

Fixing System
Socket Dowels

PFEIFER Socket Dowels with right angle, transfer forces into the concrete directly without requiring special reinforcement bars.

Material:

M 6 – M 12
DIN 2394, St 34-2 NBK
M 16 – M 24
DIN 1626, St 33/37-2



Minimal tolerances from the dimension specifications are possible. They will not influence the load capacity.

Ref. No. plain	Ref. No. zinc-plated	Load capacity kg	Size d	Dimensions mm				Packing unit pieces	Weight approx. kg/100 pieces
				a	h	e	j		
–	05.256.083.050	300	M 8	30	50	8	20	500	1,80
–	05.256.103.060	600	M 10	35	60	10	25	400	3,80
–	05.256.123.045	400	M 12	18	45	12	25	200	4,80
–	05.256.123.070	800	M 12	40	70	12	30	200	7,10
05.256.162.060	05.256.163.060	800	M 16	24	60	16	30	100	11,70
05.256.162.100	05.256.163.100	1300	M 16	32	100	16	35	100	18,90
05.256.202.070	05.256.203.070	1200	M 20	30	70	20	30	100	17,90
05.256.202.100	05.256.203.100	1600	M 20	40	100	20	35	50	23,20
05.256.242.080	05.256.243.080	1600	M 24	40	80	24	35	50	32,40

Sample order:

200 PFEIFER Socket Dowels with angular end, plain, M 16 x 60 mm:

200 PFEIFER Socket Dowels ref. no. 05.256.162.060

PFEIFER Nail Disc

Item-No. 05.200

PFEIFER Cover Cap

Item-No. 05.229



PFEIFER

Fixing System

Accessories

Socket Dowels are fastened easily to wooden or plastic formwork by means of the PFEIFER Nail Disc.

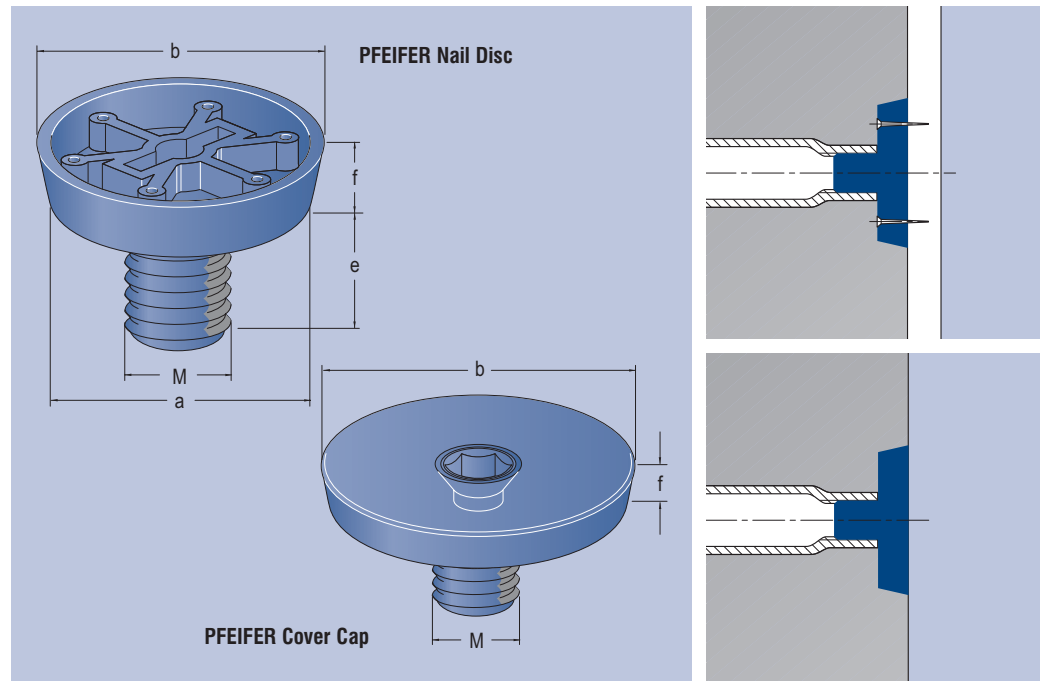
PFEIFER Cover Caps are used to seal socket dowels if they are cast in recessed using PFEIFER naildiscs. They are designed for a permanent and even surfaced sealing. If there is any corrosive atmosphere the stainless steel type should be used. In order to preserve the socket dowels we recommend to lubricate it.

Material:

HDPE

Material Cover Cap:

Steel, zinc-plated or stainless steel



Ref. No.	Thread size M	Nail Disc Dimensions mm				Packing unit pieces	Weight approx. kg/packing unit	Cover Cap		Packing unit pieces
		a	b	e	f			Ref. No. zinc-plated	Ref. No. stainless steel	
05.200.100	M 10	48	58	11	10	200	1,20			
05.200.120	M 12	48	58	11	10	200	1,80	05.229.123	05.229.124	50
05.200.140	M 14	48	58	11	10	200	1,40			
05.200.160	M 16	48	58	11	10	200	2,00	05.229.163	05.229.164	50
05.200.180	M 18	48	58	11	10	200	1,60			
05.200.200	M 20	48	58	11	10	200	2,20	05.229.203	05.229.204	25
05.200.240	M 24	48	58	11	10	200	2,40	05.229.243	05.229.244	25
05.200.300	M 30	48	58	11	10	200	3,10	05.229.303	05.229.304	25

Sample order for 200 PFEIFER Nail Discs for thread size M 18:
200 PFEIFER Nail Discs ref. no. 05.200.180

Sample order for 200 PFEIFER Cover Caps, stainless steel, for thread size M 20:
200 PFEIFER Cover Caps ref. no. 05.229.204

PFEIFER Polyamide Sockets

Item-No. 05.170

We recommend Polyamide Sockets only for fixings, for which a general technical approval is not necessary.



PFEIFER

Fixing System
Polyamide Sockets

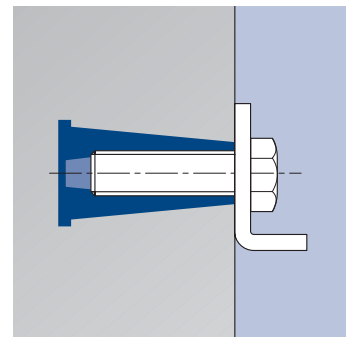
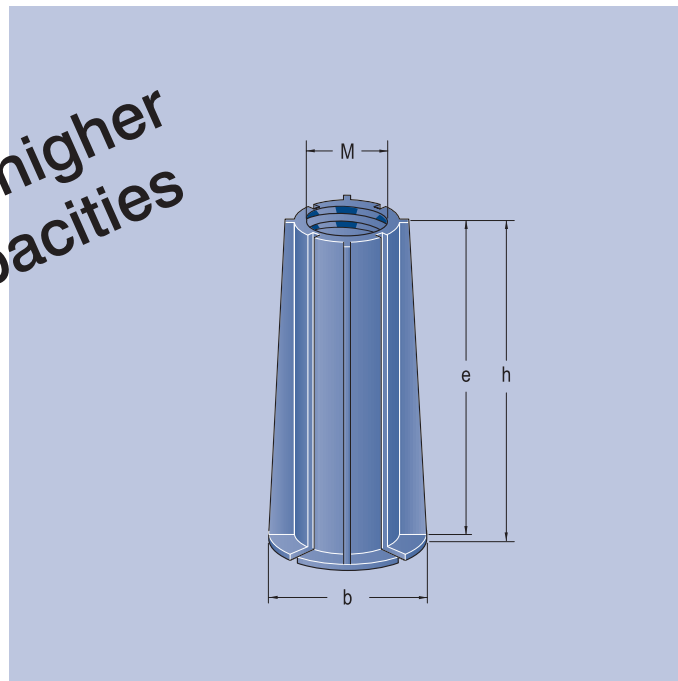
Polyamide Sockets are designed to offer a simple and cost effective method of fixing components to finished precast concrete units as an alternative to more time consuming post drilled fixings and cast in channel. The new Polyamide Sockets offer a secure and positive engagement through being completely encapsulated by concrete when in the desired position.

The Polyamide Sockets are protected against damage caused by heat, weather conditions (ultraviolet light) and hot water. PFEIFER Polyamide Sockets are resistant to neutral oils, fats, fuels and many types of different solvents.

The values are valid for concrete with a compressive strength of 25 N/mm².

Material: Ultramide

Now with higher load capacities



Ref. No.	admissible Force kN	Size M	Dimensions mm			Packing unit pieces	Weight approx. kg/100 pieces
			b	h	e		
05.170.060	1.0	M 6	14	23	22	1000	1.8
05.170.080	1.8	M 8	17	30	29	1000	3.3
05.170.100	3.5	M 10	24	37	36	1000	6.2
05.170.120	4.8	M 12	27	44	43	500	4.9
05.170.140	6.0	M 14	29	52	51	500	6.5
05.170.160	8.0	M 16	32	58	57	500	9.7

Sample order:
1000 PFEIFER Polyamide Sockets M 6:
1000 PFEIFER Polyamide Sockets ref. no. 05.170.060

Installation Instructions for PFEIFER Polyamide Sockets

1. Range of application

Can be used to fix gate posts, door and window frames, partitions etc.; or to secure pipes, support brackets, etc., and as window tie bar of HP shells and other shed roof structures.

By installing Polyamide Sockets in pre-determined positions additional holes for wall claws are unnecessary. It is easy to attach brackets to the Polyamide Sockets for the installation of pipes (water, heating and drainage pipes).

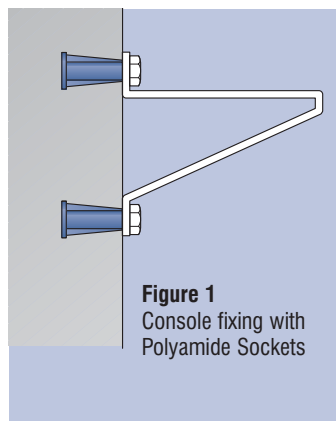


Figure 1
Console fixing with Polyamide Sockets

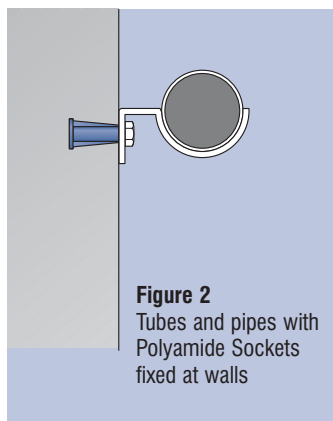


Figure 2
Tubes and pipes with Polyamide Sockets fixed at walls

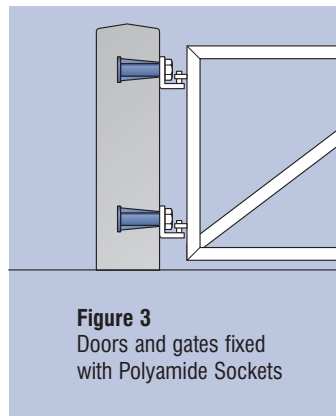


Figure 3
Doors and gates fixed with Polyamide Sockets

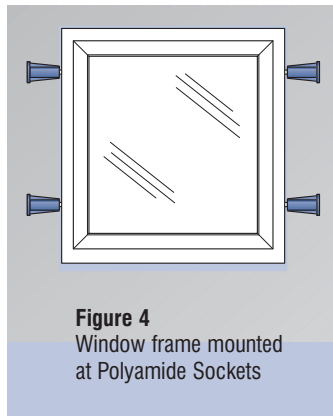


Figure 4
Window frame mounted at Polyamide Sockets

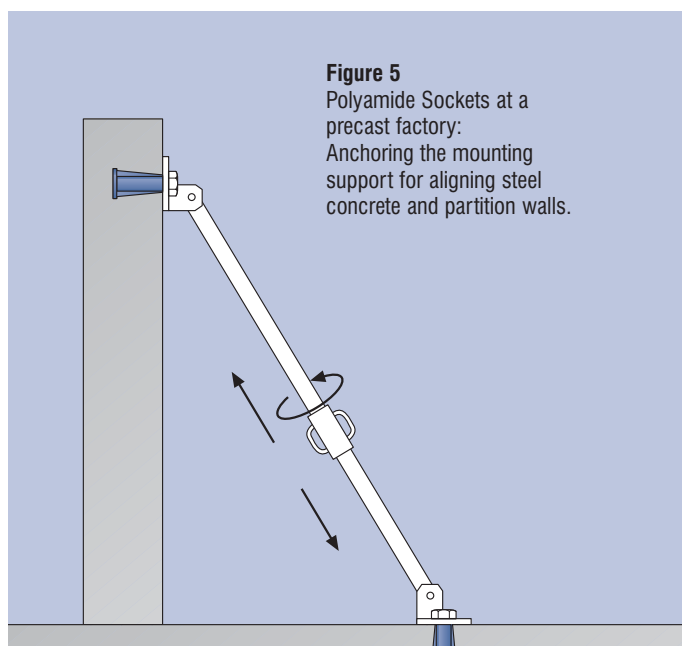


Figure 5
Polyamide Sockets at a precast factory:
Anchoring the mounting support for aligning steel concrete and partition walls.

2. Installation

The position of the sockets has to be marked on the formwork. The Polyamide Sockets are installed either by means of the fixing screw, ref. no. 05.206 or by the nail cap, ref. no. 05.174. It is also possible to use nails to fix it to wooden formwork. The thread is sealed off during assembly by a thread cap, ref. no. 05.176.

It is necessary to obtain the minimum distances between the sockets a_z , and the edge distances a_r . The minimum thickness of the panel must also be checked.

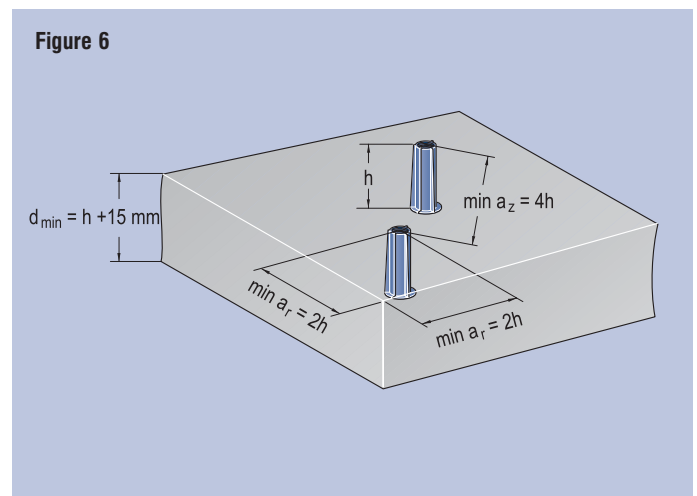


Figure 6

Warning:

The Polyamide Sockets can only be used with the full load capacity, if the bolts are screwed in with at minimum $\frac{3}{4}$ of the socket screw in depth.

Further more the Polyamide Sockets can not be used for applications with temperatures higher than 120°.

PFEIFER Nail Cap for Polyamide Sockets

Item-No. 05.174

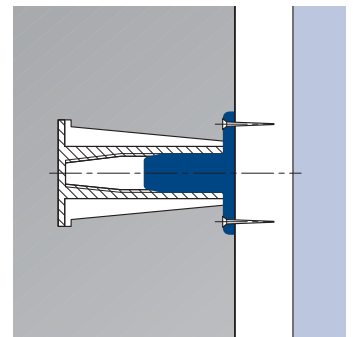
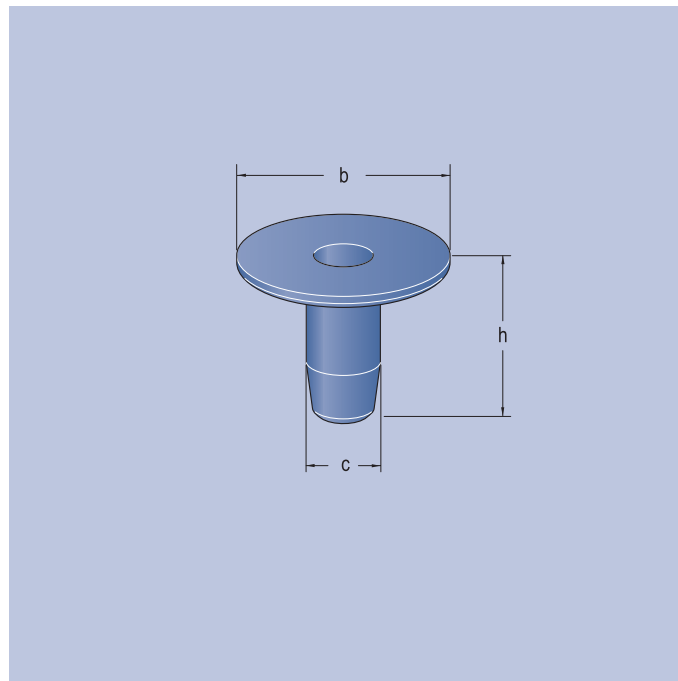


PFEIFER

Fixing System
Accessories

Nail Caps are employed to fasten Polyamide Sockets to wooden formwork.

Material:
Plastic



Ref. No.	for Polyamide Socket	Dimensions mm			Packing unit pieces	Weight approx. kg/packing unit
		b	c	h		
05.174.060	M 6	24	5,5	11	1000	0,9
05.174.080	M 8	26	6,8	14	1000	1,2
05.174.100	M 10	28	8,7	17	1000	1,4
05.174.120	M 12	30	10,3	20	500	0,8
05.174.140	M 14	32	12,0	23	500	1,0
05.174.160	M 16	36	14,0	26	500	1,2

Sample oder:
1000 PFEIFER Nail Caps for Polyamide Sockets M 6:
1000 PFEIFER Nail Caps ref. no. 05.174.060

PFEIFER Fixing Screw for Polyamide Sockets

Item-No. 05.206

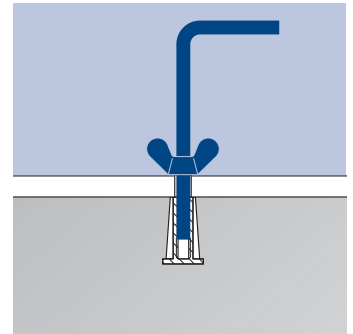
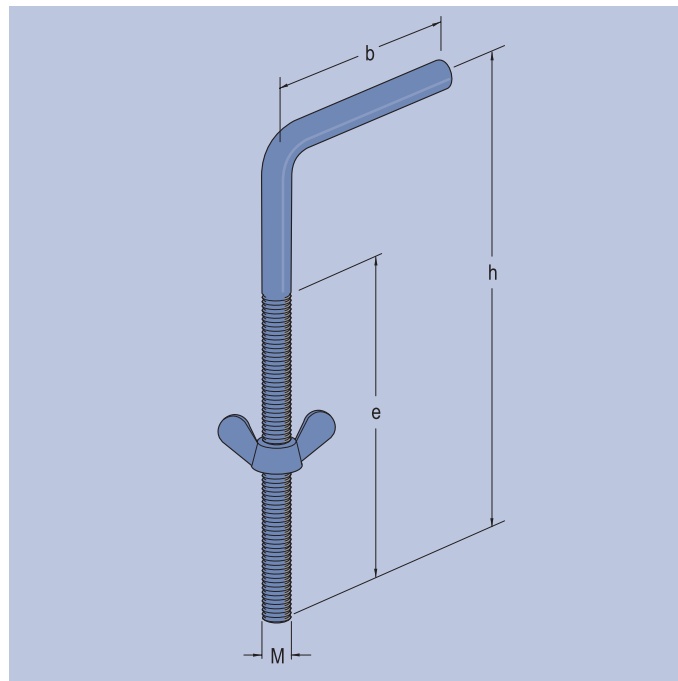


PFEIFER

Fixing System
Accessories

By means of the Fixing Screw, Polyamide Sockets can be fastened safely and quickly to all formwork types to close tolerances and at correct angles.

Material:
Steel, galvanized-chromatized



Ref. No.	for Polyamide Socket	Size d	Dimensions mm			Weight approx. kg/piece
			b	e	h	
05.206.063	M 6	M 6	60	80	120	0,06
05.206.083	M 8	M 8	60	80	120	0,11
05.206.103	M 10	M 10	60	110	150	0,19
05.206.123	M 12	M 12	60	150	180	0,26
05.206.143	M 14	M 14	60	150	180	0,36
05.206.163	M 16	M 16	60	150	180	0,46

Sample order:
50 PFEIFER Fixing Screws, galvanized-chromatized, fitting to Polyamide Socket M 10:
50 PFEIFER Fixing Screws ref. no. 05.206.103