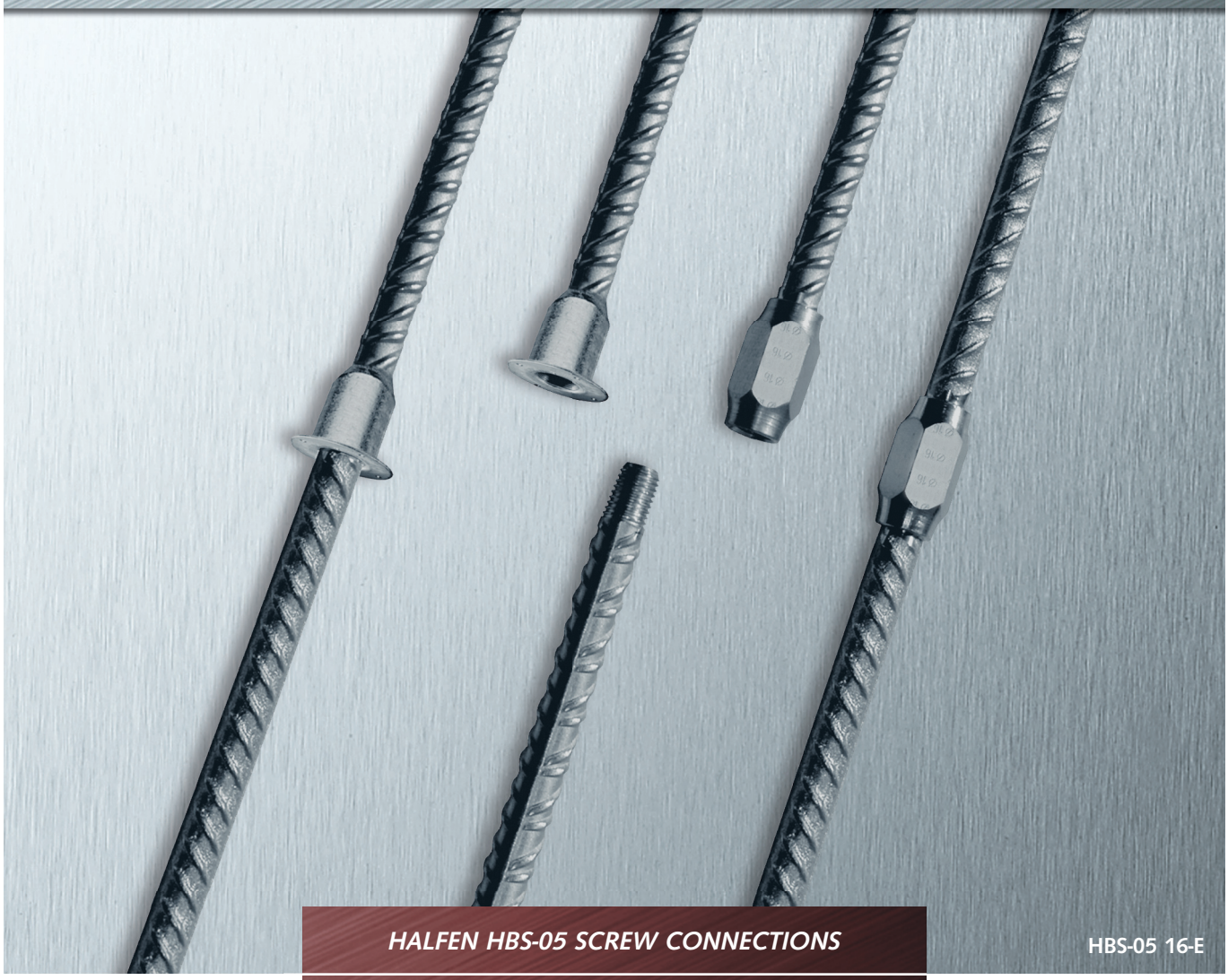
HALFEN HBS-05 SCREW CONNECTIONS

TECHNICAL PRODUCT INFORMATION



HALFEN HBS-05 SCREW CONNECTIONS

CONCRETE

HBS-05 16-E

HALFEN

YOUR BEST CONNECTIONS

HALFEN HBS-05 SCREW CONNECTIONS

General Overview

HALFEN HBS-05: The versatile screw connection

With the HALFEN HBS-05 Screw connector reinforcement connections are made by simply screwing together socket and connecting bars. With this huge versatility nearly every type of reinforcement connection can be created.

HALFEN HBS-05 fulfills national and international calculation standards. Extensive certificates and test reports prove suitability even for extreme circumstances:

- increased fatigue stability in bridge structures
- alternating cyclic loads, including large earthquakes
- impact loads in nuclear power-stations

HALFEN HBS-05 Screw connections guarantee planning reliability and increased cost efficiency. By using high-quality base materials, and with the high manufacturing standards which are standard in our certificated production facilities, the continuous reliability and quality of HALFEN products is guaranteed.

HBS-05 Sockets and connecting rebars

Increased reliability in planning:

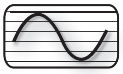
- Officially approved by DIBt approval no. Z-1.5-189
  (DIBt Deutsches Institut für Bautechnik = German institute for building technology)
- Approval also for non-predominantly static loads and maximum fatigue strength for example: use in bridges or crane rails
- Maximum ductility – meets the requirements for alternating cyclic loads such as in earthquake or similar natural catastrophes
- Numerous country-specific approvals, tests reports and certificates confirm compliance with the calculation criteria used in international standards
- Exceptional load capacity – The HBS-05 fulfills the high demands required for exceptional loads i.e. explosions or impact loads

Efficient and economical:

- No torque wrench or special tools are required to install the sockets. A simple visual check is all that is required
- An extensive range of accessories; pre-assembled socket bars and formwork fixings save installation time and guarantee optimal support in the formwork
- Easy identification of matching socket and connector bars by color coded screw plugs and protective caps

Turning Torso in Malmö (Sweden)

Official building authority approval



Suitable also for non-predominantly static loads

Approved for exceptional loads

Fulfills requirements for buildings in earthquake endangered zones

Internationally recognised with ISO 15835 standard

HALFEN HBS-05 SCREW CONNECTIONS

General Overview

Official building authority approval DIBt Z-1.5-189

An extensive range of threaded sockets and end-anchor with building authority approval allows a wide range of possible applications. All types can be used for predominantly static loads as well as for non-predominantly static loads. In predominantly static loads, as for continuous rebar, all of these connection types can be exposed to 100% of both tensile and compression load capacity.

No torque wrench or special tools are required to install the sockets; a simple visual check is all that is needed to ensure correct installation. The bar must be screwed into the socket ensuring that the thread is not visible.

Fatigue strength according to the approval

The values achieved for fatigue stability in HBS-05 Screw connections are a guarantee for operational stability in structures that are subject to fatigue control for example: road-bridges, towers or machinery foundations.

- Stress variation ranges for $N = 2 \cdot 10^6$:
  $\Delta\sigma_{RSK}$ = 80 N/mm² for
  d_{HBS} = 12 - 20 mm
  $\Delta\sigma_{RSK}$ = 70 N/mm² for
  d_{HBS} = 25 - 28 mm
- Wöhler curve stress exponents:
  $k_1 = 3.5$ for $N \leq 2 \cdot 10^6$
  $k_1 = 3$ for $2 \cdot 10^6 \leq N \leq 10^7$
  $k_2 = 5$

Exceptional loads according to the approval

Dimensioning for exceptional loads, for example: in nuclear power stations or in buildings subject to possible explosions or for impact loads, places high demands on the screw connections deformability properties. Thanks to the high ductility all types in the HALFEN HBS-05 system fulfill the demands caused by these effects; even under shock loads.

HBS-05-Seismic, Application according to test certificate A - 32/08

HALFEN HBS-05-Seismic Screw connections are earthquake proof, even in large earthquakes according to ISO 15835.
The ductile behavior of the screw connection in alternating cyclic loads is an essential element when proving energy dissipations capability in seismic building components in accordance with EC8 (EN 1998-1) i.e. national Standards. See also pages 4, 7 and 8.

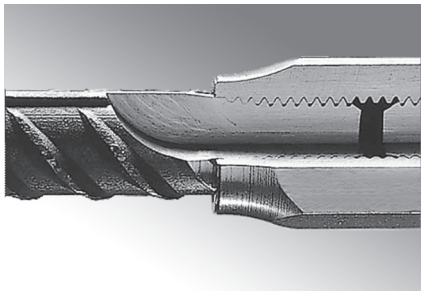
International Approvals

The HALFEN HBS-05 Screw connector fulfills the requirements for a number of international calculation standards. Further information on types, their use and application possibilities for HALFEN HBS-05 Screw connectors respecting national and international calculation regulations can be acquired from our Engineering Support team.
For addresses please see the reverse side of this catalogue. Approvals, Certificates etc. for: Germany, Finland, Croatia, Poland, Rumania, Lithuania, Sweden, Switzerland, United Kingdom, the Ukraine and Hungary.

Application: HBS-05-Seismic according to test certificate A - 32/08

Maximum ductility and optimised technologies in manufacturing

Using the best quality ductile materials combined with the best technology in thread manufacturing guarantees maximum ductility and safety in the screw connection, even under the effects of large earthquakes.



Leutschen Tower in Zurich was constructed using HBS-05-Seismic products

The bolt threads are cold formed; the resulting surface compression increases the hardness of the thread. The conical shaping at the bar-tip guarantees a tight fit of the bar and reduces the notch sensitivity.

HBS-05-Seismic meets the requirements for earthquakes. Suitability for medium to large earthquakes according to ISO 15835 and for CUAP-draft.
In cases like these the bolt connections are exposed to alternating cyclic loads whereby, the limits of the allowed elongation value must not be exceeded.
In accordance with EN 1992-1-1/ BS4449. Maximum ductility reinforcement rebar B500C is used for HBS-05-Seismic Screw connections.

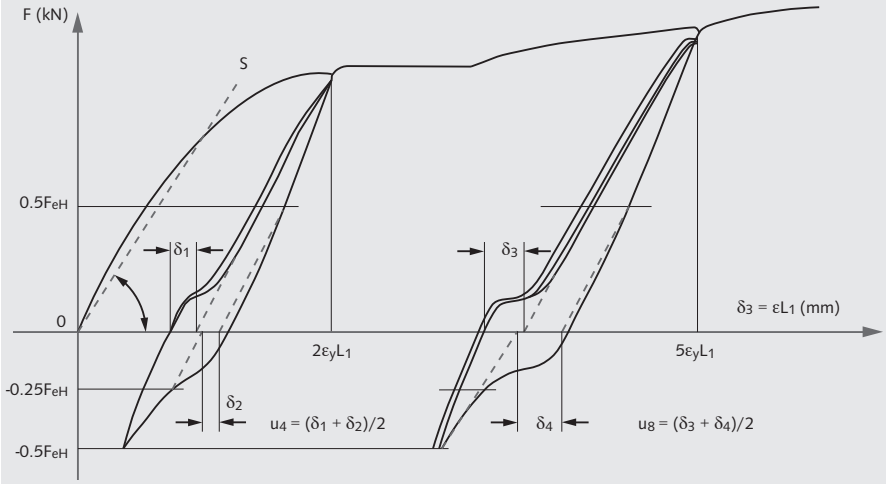


Diagram: Shows an experiment done in a series of test with HBS-05-Seismic under cyclic loading according to ISO 15835: In large earthquake after 8 cycles the residual elongation u_8, between the strain of 5 ε_y on the tension side and contraction of -0.5 f_y on the compression side, must not exceed 0.6 mm.

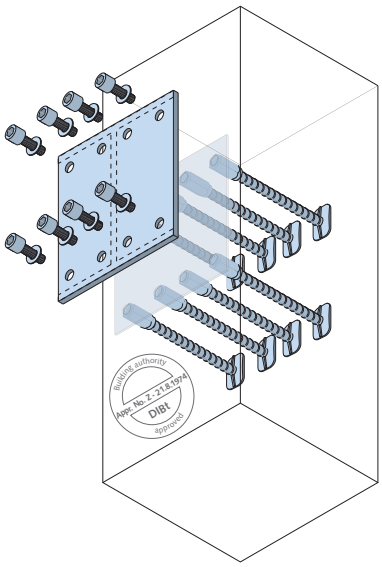
HBS-05-Seismic product overview, load bearing capacity and ductility → pages 7-8

Structural steel connections using the HALFEN HUC Universal connection

The HALFEN HUC Universal connection is a highly efficient system for introducing static stresses into concrete components using bolt connections.

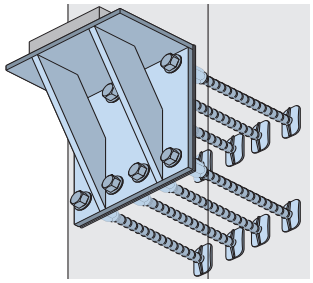
The HSC-B Connector is designed for large loads, safely transferring tension loads, shear loads and bending moments. The calculation for HSC-B Socket bars with and without end anchors is described in detail in our Technical Product Information HALFEN HUC Universal Connection. Download at www.halfen.de.

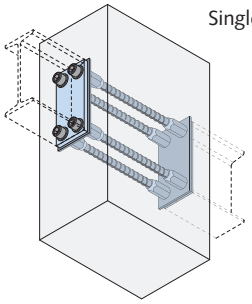
HSC-B Concrete steel connector
End plate for girder connection, fin-plates or for individual constructions



HSC-B Concrete steel connector
Socket bar in concrete with positioning-plate for accurate fit

HSCC Steel corbels
To simplify the planning process HALFEN offers type tested standard corbels for connections in steel constructions. In comparison to a reinforced concrete corbel the HSCC has up to twice as much load capability.





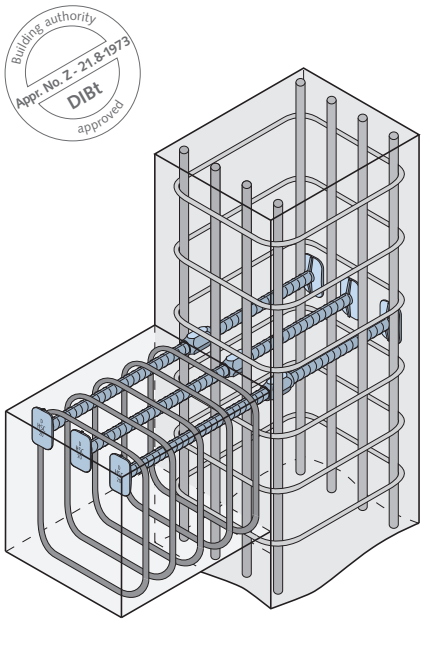
Single and double sided steel construction connections

End anchors with HALFEN HSC Stud connector

The HALFEN HSC Stud connector is a building authority approved reinforcement that has been optimised for anchorings in concrete.
The reinforcement capability can be used to full capacity in spite of extremely short rebar lengths.
Further information can be found in our Technical Product Information HALFEN HSC Stud connector. Download at www.halfen.de

The HALFEN HSC Anchors are especially suitable for highly reinforced applications, for example corbels and frame corners. The difficulties occurred in conventional methods of reinforcement layout and anchoring bar-stresses are avoided. The required amount of reinforcement can be reduced and the system is better defined. Apart from the time and cost saving aspects a notable advantage is the increased safety reliability.

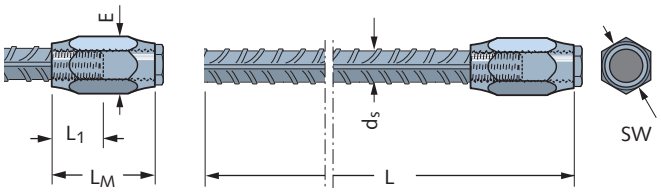
- innovative anchor-head
- forged anchor-head allows extremely short anchor lengths
- calculation design concept based on EC 2



Corbel with HALFEN HSC Stud connector

Product Overview

HBS-05-S Socket bars with screw socket



HBS-05-S Standard lengths [mm]

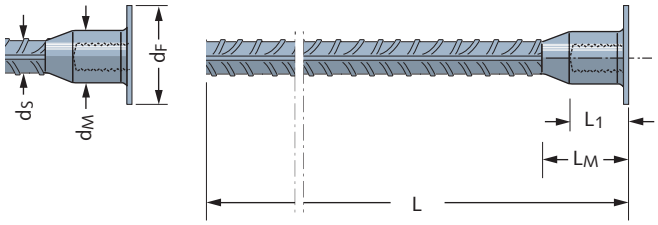
Reinforcing steel bars B 500 B according to DIN 488-1

HBS-05-		Order no.	Dimensions					
Rebar d_s	L	0053.020-	Thread	L_1	L_M	SW	E	Weight kg/piece
S-12	400	00001	M12	16.5	36	19	21.9	0.402
	610	00002						0.589
	860	00003						0.811
	1180	00004						1.096
	① ...	-						-
S-14	990	00007	M14	19.5	42	22	25.4	1.275
	1370	00008						1.735
	① ...	-						-
S-16	400	00009	M16	22.5	48	24	27.7	0.759
	1110	00010						1.857
	1570	00011						2.584
	① ...	-						-
S-20	400	00012	M20	28.5	60	30	34.6	1.240
	1380	00013						3.615
	① ...	-						-
S-25	400	00015	M25 × 2.5 Special thread	36.0	75	36	41.6	1.978
	1730	00016						7.032
	① ...	-						-
S-28	400	00018	M28 × 2.5 Special thread	40.5	84	41	47.3	2.557
	1930	00019						9.865
	① ...	-						-
S-32	① ...	-	M32 x 3 Special thread	45.5	96	50	57.5	-

Other bar-lengths and bending shapes are available on request (→ page 9).
① Please state required length when ordering.

Threads of the HALFEN HBS-05 Socket and connecting bars are delivered with color coded screw plugs and protective caps. Thread size corresponding color codes are specified in the connecting bar tables.

HBS-05-B Socket bars with forged socket and nailing flange



HBS-05-B Standard lengths [mm]

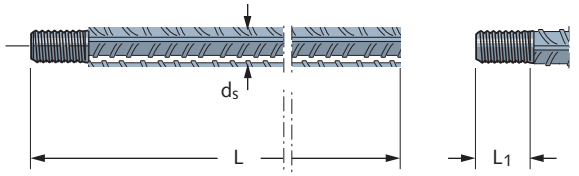
Reinforcing steel bars B 500 B according to DIN 488-1

HBS-05-		Order no.	Dimensions					
Rebar d_s	L	0053.010-	Thread	L_1	L_M	d_M	d_F	Weight kg/piece
B-12	400	00001	M12	18	35	19	44	0.440
	610	00002						0.613
	860	00003						0.835
	1300	00005						1.225
	① ...	-						-
B-14	400	00006	M14	21	39	22	46	0.542
	1370	00009						1.748
	① ...	-						-
B-16	400	00010	M16	25.5	48	25	49	0.758
	1110	00011						1.856
	1570	00012						2.583
	① ...	-						-
B-20	400	00013	M20	30	60	31	57	1.210
	1380	00014						3.580
	① ...	-						-
B-25	400	00016	M25 × 2.5 Special thread	39	75	39	63	1.929
	1730	00017						6.983
	① ...	-						-
B-28	400	00019	M28 × 2.5 Special thread	44	84	44	69	2.395
	1930	00020						9.703
	① ...	-						-

Other bar-lengths and bending shapes are available on request (→ page 9).
Special lengths may have resistance flash welded bar joints at delivery.
① Please state required length when ordering.

Product Overview

HBS-05-A Connecting bars



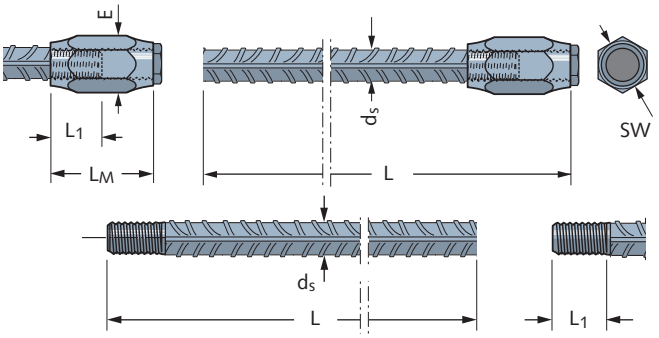
HBS-05-A Standard lengths [mm]

Reinforcing steel bars B 500 B according to DIN 488-1

HBS-05-		Order no.	Dimensions		Color code	Weight
Rebar d_s	L	0053.030-	Thread	L_1		kg/piece
A-12	380	00001	M12	16.5	green	0.337
	590	00002				0.524
	840	00003				0.746
	1160	00004				1.030
	① ...	-				-
A-14	970	00007	M14	19.5	red	1.174
	1350	00008				1.634
	① ...	-				-
A-16	375	00009	M16	22.5	orange	0.592
	1085	00010				1.714
	1545	00011				2.440
	① ...	-				-
A-20	370	00012	M20	28.5	lightblue	0.914
	1350	00013				3.335
	① ...	-				-
A-25	360	00015	M25 × 2.5 Special thread	36.0	brown	1.386
	1690	00016				6.507
	① ...	-				-
A-28	360	00018	M28 × 2.5 Special thread	40.5	black	1.739
	1890	00019				9.129
	① ...	-				-
A-32	① ...	-	M32 × 3 Special thread	45.5	blue	-

Also available with left-hand thread HBS-05-AL.
Connecting rebars with left-hand thread on request.
Other bar-lengths and bending shapes are available on request (→ page 9).
① Please state required length when ordering.

HBS-05-Seismic



Order example: HBS-05-Seismic
Order number: 0053.529-00003
Socket bar HBS-05-S-16-Seismic L = ①....
Connecting bar HBS-05-A-16-Seismic L = ①....

HBS-05-S-Seismic Socket bars with screw sockets [mm]

Reinforcing steel bars B 500 C according to EN 1992-1-1/BS4449

HBS-05-		Order no.	Dimensions				
Rebar d_s	L		Thread	L_1	L_M	SW	E
S-12-Seismic	① ...	0053.529-00003	M12	16.5	36	19	21.9
S-14-Seismic	① ...		M14	19.5	42	22	25.4
S-16-Seismic	① ...		M16	22.5	48	24	27.7
S-20-Seismic	① ...		M20	28.5	60	30	34.6
S-25-Seismic	① ...		M25 × 2.5 Special thread	36.0	75	36	41.6
S-32-Seismic	① ...		M32 x 3 Special thread	45.5	96	50	57.5

Other bending shapes are available on request (→ pages 9-10).
① Please state required length when ordering.

HBS-05-A-Seismic Connecting bars [mm]

Reinforcing steel bars B 500 C according to EN 1992-1-1/BS4449

HBS-05-		Order no.	Dimensions		Color code
Rebar d_s	L		Thread	L_1	
A-12-Seismic	① ...	0053.529-00003	M12	16.5	green
A-14-Seismic	① ...		M14	19.5	red
A-16-Seismic	① ...		M16	22.5	orange
A-20-Seismic	① ...		M20	28.5	lightblue
A-25-Seismic	① ...		M25 × 2.5 Special thread	36.0	brown
A-32-Seismic	① ...		M32 x 3 Special thread	45.5	blue

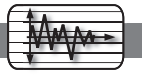
Other bending shapes are available on request (→ page 10).
① Please state required length when ordering.

Load Bearing Capacity

Forces (rebar) and ductility for HBS-05 B 500 B

Forces (rebar) F_{sd} for HBS-05 Socket and connecting bars B 500 B			
Reinforcing steel bars B 500 B according to DIN 488-1			
Bar diameter [mm]	F_{sd} [kN]	R_m/R_e	A_{gt} [%]
12	49.2	≥ 1.08	≥ 5.0
14	66.9		
16	87.4		
20	136.6		
25	213.4		
28	267.7		
32	349.7		
Forces (rebar) $F_{sd} = A_s \cdot f_{yd}$ ($f_{yd} = f_{yk}/1.15$) according to EN 1992-1-1			

Forces (rebar) and ductility for HBS-05-Seismic



Forces (rebar) F_{sd} for HBS-05 Socket and connecting bars B 500 C			
Reinforcing steel bars B 500 C according to EN 1992-1-1/BS4449			
Bar diameter [mm]	F_{sd} [kN]	R_m/R_e	A_{gt} [%]
12	49.2	≥ 1.15 < 1.35	≥ 7.5
14	66.9		
16	87.4		
20	136.6		
25	213.4		
32	349.7		
Forces (rebar) $F_{sd} = A_s \cdot f_{yd}$ ($f_{yd} = f_{yk}/1.15$) according to EN 1992-1-1			

Specification texts example

HALFEN Screw connection type HBS-05-S socket reinforcement bar including plastic-protection cap, for tension and compression resistant connection of reinforcement bars.

In accordance with building authority approval Z-1.5-189, for predominantly static, non-predominantly static and exceptional loads.

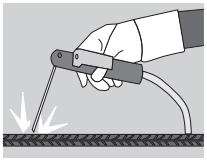
HBS-05-S-20 / 1380
S = socket bar, 20 = diameter reinforcement bar [mm], B500B, M20 thread, thread depth L_1 = 28.5 mm, bar length L = 1380 [mm].
or equivalent; deliver and install to formwork according to the manufacturer´s assembly instructions.

HBS-05 Screw connection offers a number of bending shapes and combination possibilities. HALFEN makes bent, cranked and straight bars (left-hand thread also available) or with end-anchors to weld on to steel structures or with reducing sockets according to customers requests. When ordering please state the type description and the relevant measurements x, y, c, d_{BR}, v, α etc.

Legend:

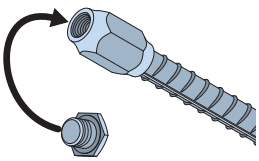
S :	Socket bar with screw socket
B :	Socket bar, forged, with nail flange
A :	Connecting bar
L :	Left-hand thread
D :	Double socket bar
AA:	Double connecting bar
G :	Bent
U :	Bent 2x
E :	Weld on end anchor
EA :	Weld on end anchor bar (fixed)
RZ :	Reducing sockets
w :	Symbol for flash-butt welding

Notes



If constructing special-lengths and special-types in the factory and weld joints need to be done on HBS-05 reinforcing connections, according to DIN EN ISO 17660 flash-butt welding joints are compulsory. The weld joints are marked with a 'w' in the construction drawing for each product.

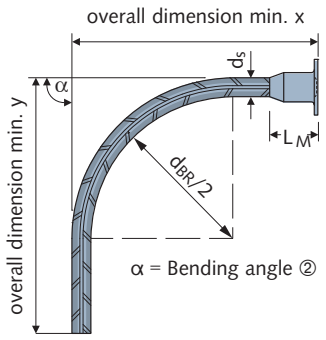
Flash-butt welding is not permitted in areas of non-predominantly static loads. Welding can also negatively influence the material properties. For this reason welding or applying heat to bend-areas is prohibited.
DIN EN ISO 17660 is to be observed.



The thread in the HALFEN HBS-05 Sockets and connection bars are delivered with color-coded thread- protection caps to prevent corrosion. Replace the caps after striking the formwork and remove only immediately prior to connecting the sockets and connection rebar.

Bending Shapes/Possible Combinations

HBS-05-BG Bent socket bars, forged socket with nailing flange



Order example:
Socket bars BG,
bent 1×
HBS-05-BG-16
x = 250 mm
y = 550 mm
d_{BR} = 10 d_s

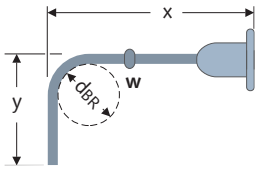
min. x and min. y dimensions for bent socket bars -BG [mm]

Article description HBS-05-Rebar/d_s /x/y	Thread L_M	with bending roll Ø d_{BR}: 4d_s min. x	4d_s min. y	7d_s min. x	7d_s min. y	10 d_s min. x	15 d_s min. x	20 d_s min. x
BG-12/①...	35	95	96	-	-	131	161	191
BG-14/①...	39	109	112	-	-	151	186	221
BG-16/①...	44	124	128	-	-	172	212	252
BG-20/①...	51	-	-	181	190	211	261	311
BG-25/①...	71	-	-	233	238	271	333	396
BG-28/①...	73	-	-	255	266	297	367	437

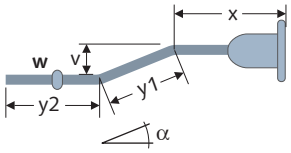
① State required lengths x and y in [mm] when ordering.
② If not stated otherwise when ordering, α will be delivered as = 90°.

Examples of bending shapes:

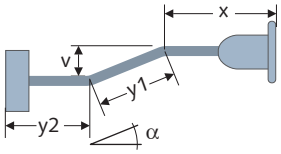
BG



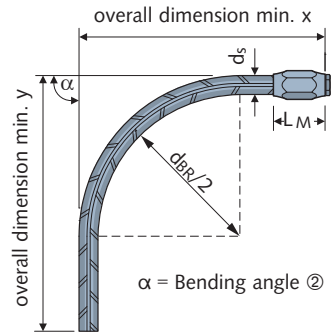
BG



BEA



HBS-05-SG Bent socket bars with threaded sockets



Order example:
Socket bars SG,
bent 1x
HBS-05-SG 16
x = 250
y = 1000
d_{BR} > 10 d_s

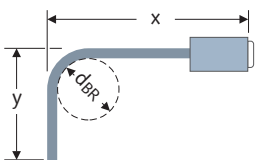
min. x and min. y dimensions for bent socket bars -SG [mm]

Article description HBS-05-Rebar/d_s /x/y	Socket L_M	with bending roll Ø d_{BR}: 4d_s min. x	4d_s min. y	7d_s min. x	7d_s min. y	10 d_s min. x	15 d_s min. x	20 d_s min. x
SG-12/①...	36	96	96	-	-	132	162	192
SG-14/①...	42	112	112	-	-	154	189	224
SG-16/①...	48	128	128	-	-	176	216	256
SG-20/①...	60	-	-	190	190	220	270	320
SG-25/①...	75	-	-	238	238	275	338	400
SG-28/①...	84	-	-	266	266	308	378	448
SG-32/①...	96	-	-	304	304	352	432	512

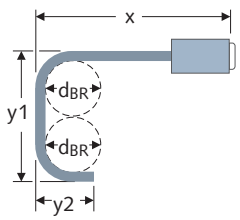
① State required lengths x and y in [mm] when ordering.
② If not stated otherwise when ordering, α will be delivered as = 90°.

Examples of bending shapes:

SG

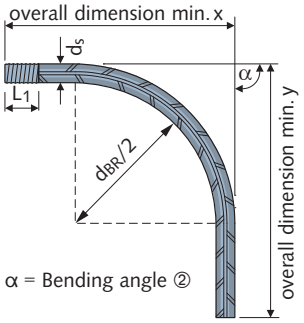


SG



HBS-05-AG/-ALG Connecting bars bent

Connecting bars
- **AG** = curved, with right-hand thread
- **ALG** = curved, with left-hand thread

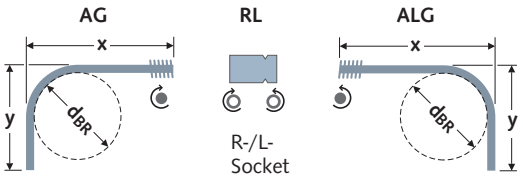


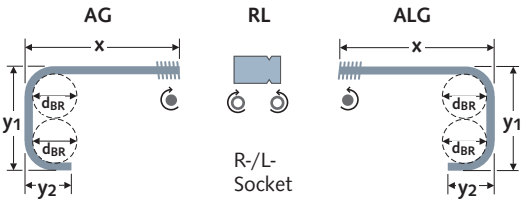
Order example:
Connecting bars AG, bent 1x
HBS-05-AG 16
x = 250
y = 1000
d_{BR} > 10 d_s

Bent connecting bars AG, -ALG [mm]

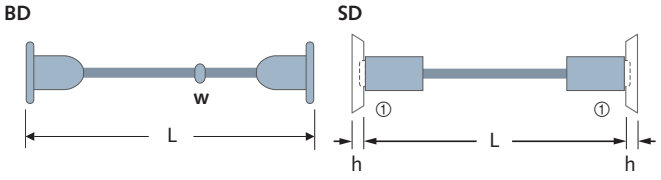
Article description HBS-05- Rebar/d_s /x/y	Thread L_1	for bends Ø d_{BR} 4 d_s min. x	4 d_s min. y	7 d_s min. x	7 d_s min. y	10 d_s min. x	15 d_s min. x	20 d_s min. x
AG - 12/①...	16,5	77	96	-	-	113	143	173
AG - 14/①...	19,5	90	112	-	-	132	167	202
AG - 16/①...	22,5	103	128	-	-	151	191	231
AG - 20/①...	28,5	-	-	159	190	189	239	289
AG - 25/①...	36,0	-	-	199	238	236	299	361
AG - 28/①...	40,5	-	-	223	266	265	335	405
AG - 32/①...	45,5	-	-	254	304	302	382	462

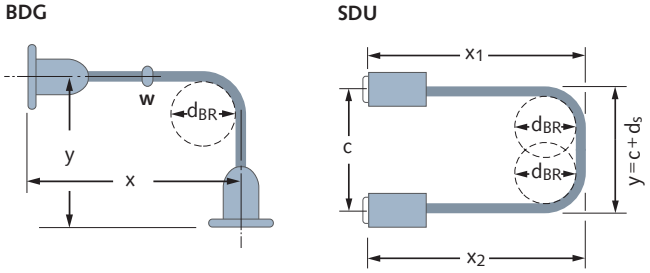
① State required lengths x and y in [mm] when ordering.
② If not stated otherwise when ordering, α will be delivered as = 90°.

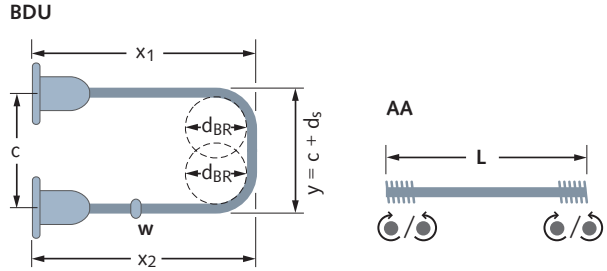




HBS-05-BD/-SD/-AA Double sockets and connecting bars





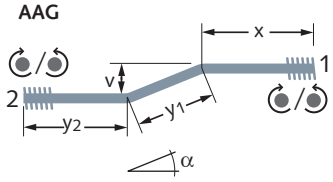


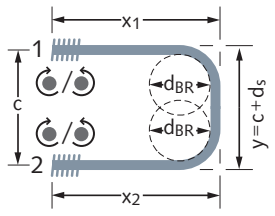
Min. length for double socket bar HBS-05 [mm]

d_s	-AA, -AEA	-SA, -ARZ, -SEA, -BEA, -SBEA	-SD, -SRZ	-BD
12	150	180	205	210
14	150	180	210	220
16	150	185	215	220
20	150	190	230	265
25	180	230	275	300
28	200	255	305	325
32	220	280	340	–

① Make allowance for thickness h (→ page 15) when using nailing-plates.

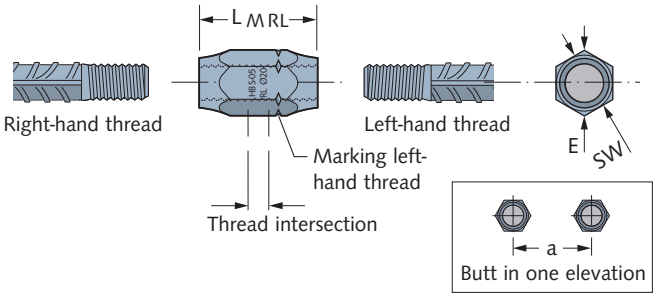
Order example:
Double socket bars with screw socket, bent twice
HBS-05-SDU 16
x_1 = 250, x_2 = 250, c = 984, y = 1000,
d_{BR} > 10 ds
Please include relevant drawings when ordering.





HBS-05-R-/L- Connecting socket

Right/left hand connection socket with overlapping counter threads to connect a non-turnable connection bar with a left-hand thread for example (HBS-05-ALG bent) to a fixed connection bar with right-hand thread.

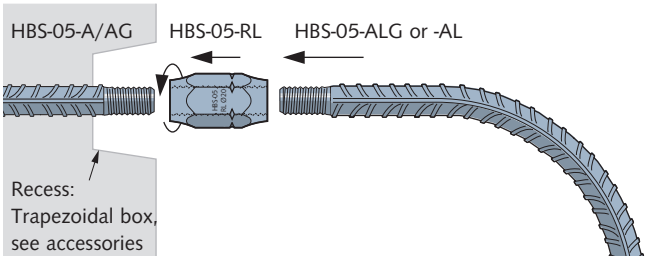


R-/L-Connecting socket [mm]

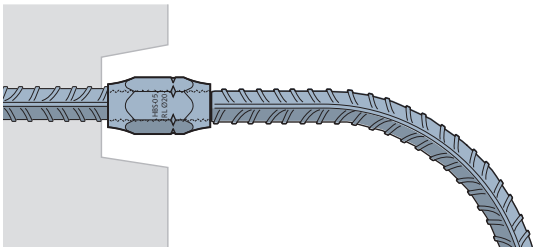
Article description HBS-05- Rebar - d_s	Order no. 0725.010-	Dimensions L_{MRL}	$a_{min.}$	SW	E
RL - 12	00001	38	42	19	21.9
RL - 14	00002	44	46	22	25.4
RL - 16	00003	50	48	24	27.7
RL - 20	00004	62	55	30	34.6
RL - 25	00005	77	67	36	41.6
RL - 28	00006	86	76	41	47.3
RL - 32	00007	98	90	50	57.7

Installation

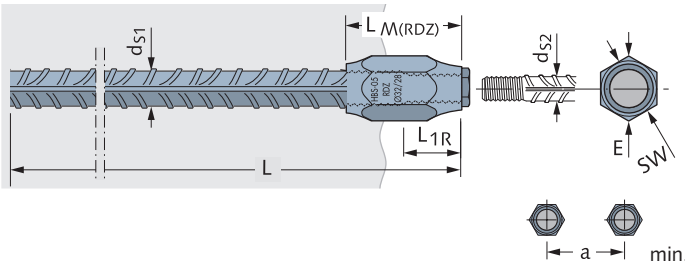
Prior to installation

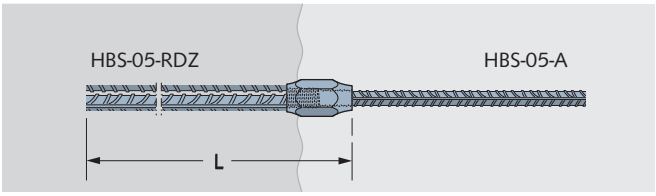


After installation



HBS-05-RDZ Reducing socket bar





min. distance between two connection-joints in one plane

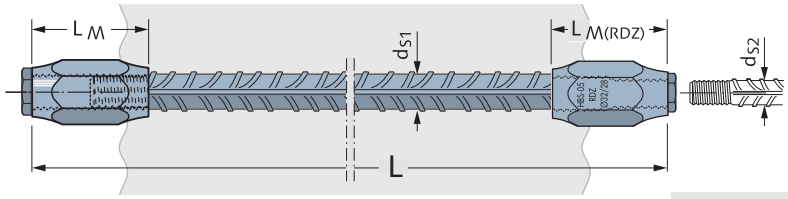
HBS-05-RDZ [mm]

Article description HBS-05 rebar d_{S1} / d_{S2} - L	Order no.	Thread		L_{1R}	$L_{M(RDZ)}$	$a_{min.}$	SW	E
RDZ - 16/14 - ①...	0053.420	M 16	M 14	19.5	50	48	24	27.7
RDZ - 20/16 - ①...		M 20	M 16	22.5	59	55	30	34.6
RDZ - 25/20 - ①...		M 25×2.5	M 20	28.5	72	67	36	41.6
RDZ - 28/25 - ①...		M 28×2.5	M 25×2.5	36.0	85	76	41	47.3
RDZ - 32/28 - ①...		M 32×3.0	M 28×2.5	40.5	96	90	50	57.7

① State required length L [mm] when ordering.

HBS-05 Reducing Socket/HBS-05 End Anchor

HBS-05-SRZ Double socket rebar, one end with reducing socket



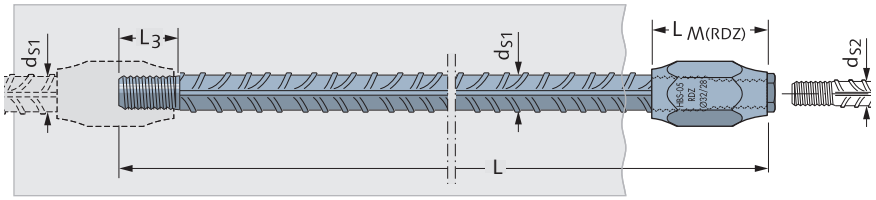
Also available in cranked shape

Sockets can be ordered separately.

HBS-05-SRZ Dimensions [mm]	
Article description HBS-05-Rebar/d_{S1} /d_{S2} - L	Order no.
SRZ - 16/14 - ①...	0053.440
SRZ - 20/16 - ①...	
SRZ - 25/20 - ①...	
SRZ - 28/25 - ①...	
SRZ - 32/28 - ①...	

① State required length L [mm] when ordering.

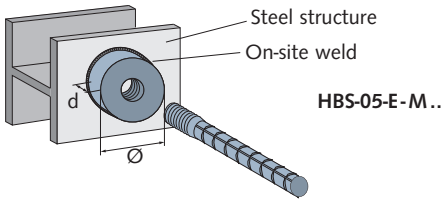
HBS-05-ARZ Double connecting bar with reducing socket

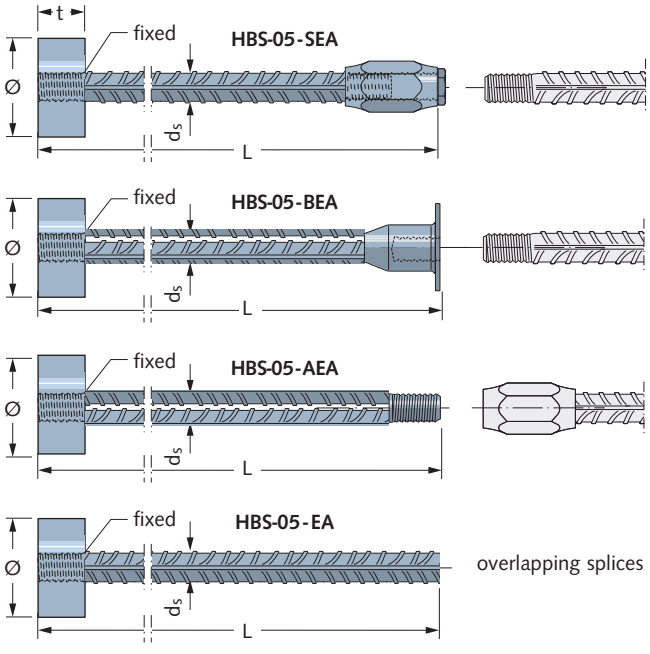


HBS-05-ARZ Dimensions [mm]	
Article description HBS-05-bar/d_{S1}/d_{S2} - L	Order no.
ARZ - 16/14 - ①...	0053.430
ARZ - 20/16 - ①...	
ARZ - 25/20 - ①...	
ARZ - 28/25 - ①...	
ARZ - 32/28 - ①...	

① State required length L [mm] when ordering.

HBS-05-EA/-E Bar with end anchor / loose end anchor





overlapping splices

Loose end anchor HBS-05-E (Dimensions see table -EA)

The HBS-05-E End-anchor is especially for attaching HBS-05 bars by welding onto steel constructions (for example welding seam). Static proof is required for each particular application. End anchor material is S235J2, material number is 1.0117 according to EN 10025-2.

Also approved for end anchorage in concrete.

HALFEN recommends: the amount of metal can be considerably reduced by using forged anchor-heads as end anchors in concrete. With the HALFEN HSC Stud Connector HALFEN offers a building authority approved reinforcement using forged anchor-heads as end anchors in concrete. (→ page 5)

HBS-05-EA End anchor bar fixed [mm]			
Article description	Dimensions		
HBS-05-rebar/d_s / L	Thread	Ø	t
EA-12 / ①...	M12	41	18
EA-14 / ①...	M14	46	20
EA-16 / ①...	M16	52	25
EA-20 / ①...	M20	64	30
EA-25 / ①...	M25 × 2.5 ②	80	35
EA-28 / ①...	M28 × 2.5 ②	90	40
EA-32 / ①...	M32 × 3.0 ②	110	45

① State required length L [mm] when ordering.
② Special thread

Order example:

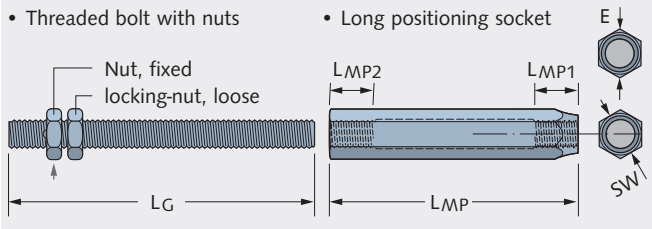
- end anchor loose: **HBS-05- E -M20**
- end anchor: **HBS-05-SEA - 20 / 740**

Type
Thread-Ø or bar-Ø
Bar length x [mm]

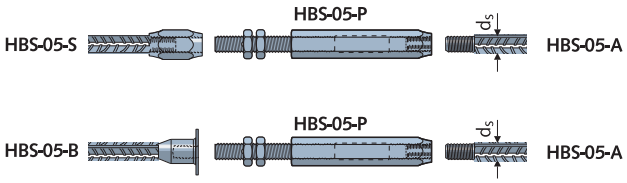
HBS-05 Positioning Socket

BS-05-P-SET, Adjustable length positioning socket

Set consists of:



Combinations with positioning socket HBS-05 - P



Standard lengths HBS-05-P [mm]							
Article description	Order no.	Dimensions					
HBS-05- ... - d_s	0725.050-	L_G	L_{MP}	L_{MP1}	L_{MP2}	SW	E
P-12-SET	00001	133	106	18	18	19	21.9
P-14-SET	00002	146	117	21	21	22	25.4
P-16-SET	00003	159	128	24	24	24	27.7
P-20-SET	00004	210	170	30	25	30	34.6
P-25-SET	00005	245	200	38	30	36	41.6
P-28-SET	00006	263	215	42	35	41	47.3
P-32-SET	00007	302	245	48	40	50	57.7

Installation dimensions for standard length positioning sockets [mm]				
Spacing between rebar ends			Reference value K	Torque value for
A	$A_{min.}$	$A_{max.}$	$K_{max.}$	Threaded bolts M_A [Nm]
171	151	191	97	30
187	167	207	104	40
203	183	223	111	60
270	250	290	150	80
314	294	334	170	100
336	316	356	179	140
385	365	405	206	190

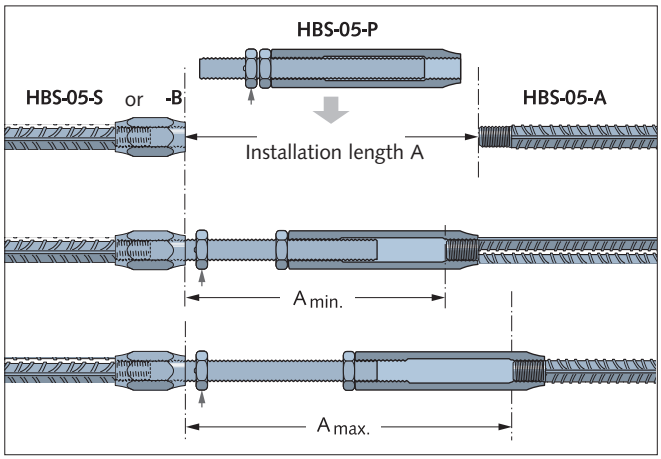
Materials:
- Positioning socket:
  11 SMn 30+C according to DIN EN 10277-3 (W 1.0715);
- Threaded rod: Strength class 10.9 according to DIN 976-1.

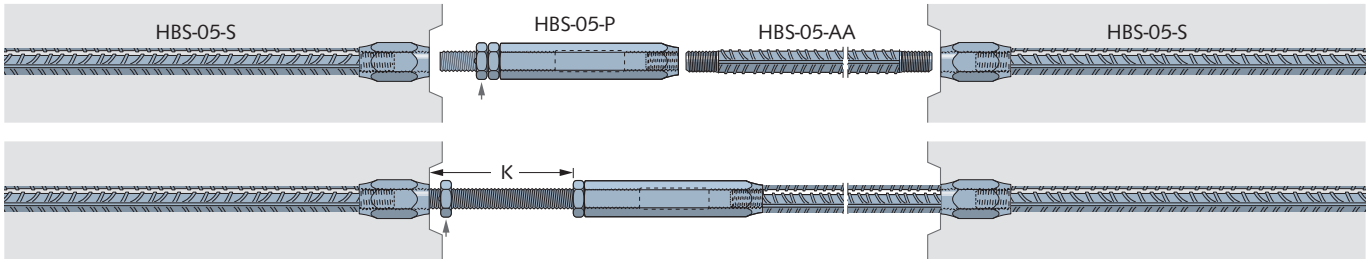
Application: the positioning socket serves as a connection between axial immovable and non-turnable reinforcing bars for example:
- in areas between previously concreted sections such as a crane opening in floor slabs
- connecting pre-cast reinforcing cages
- connection between difficult to access rebars

Positioning sockets are freely adjustable allowing building tolerances to be easily compensated.

Simple installation: screw the positioning socket on to the connection bar, using a torque wrench with a torque of M_A, screw in the treaded rod using the fixed nut then counter the loose nut against the positioning socket. Can be used for non-predominantly static loads as well as for impact loads.

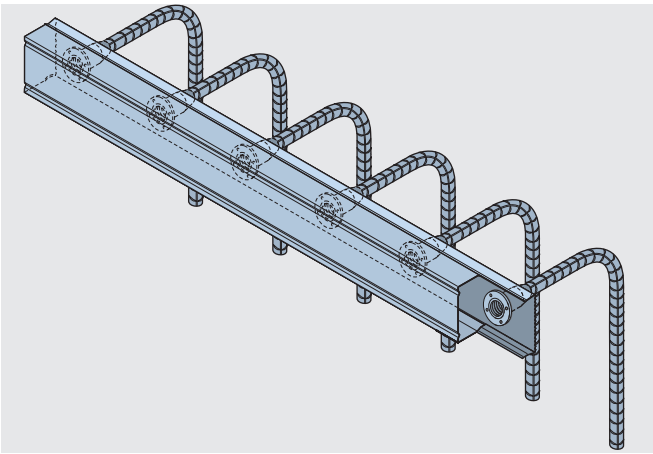
Adjusting installation length A

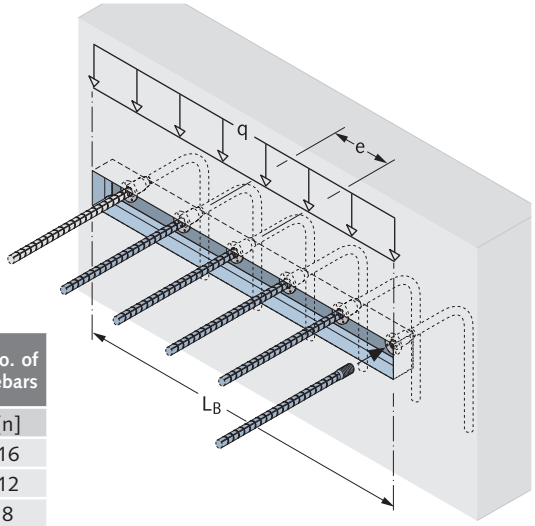




HBS-05-Box

HBS-05-Box with socket rebars





Bar spacing e	No. of rebars
[cm]	[n]
7.5	16
10	12
15	8
20	6
25	5

Maximum shear load q:

The HBS-05 Box is similar to the HALFEN Rebend connection HBT 55 casing. The maximum applicable shear load of the HBS-05 Box can be determined according to DIN EN 1992-1-1 if the supplementary reference notes on joints in the information leaflet 'Re-bending', issued by the German Concrete Association are observed.

Order example:

HBS-05-Box - 1250 - 14 / 15 - 8 / BG; L=800 x=200; 10 d_s

Type
Length L_B [mm]
Bar-d_s / Spacing e [cm]
Number of bars/Box, Type HBS-05 Socket bars
HBS-05 Socket bars dimensions
Bending roll diameter

- optimal shear load transfer with U-shaped steel casing with profiled backing
- u-shaped box cover in galvanized steel sheet
- box length: 1250 mm (other lengths on request)
- HBS-05 Socket bars are available pre-assembled and packed in 12 – 14 – 16 mm bar diameters

Areas of application:

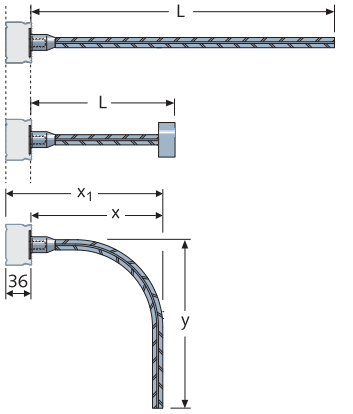
- cost effective formwork aid with mulitple in-line installation
- with sliding formwork
- recess to form a keyed joint for shear loads

The HBS-05 connection

HBS-05-B → Page 6
straight

HBS-05-BEA → Page 12
end anchor

HBS-05-BG → Page 9
bent

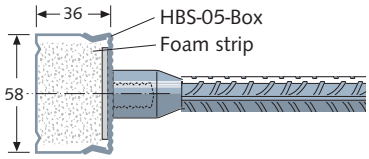


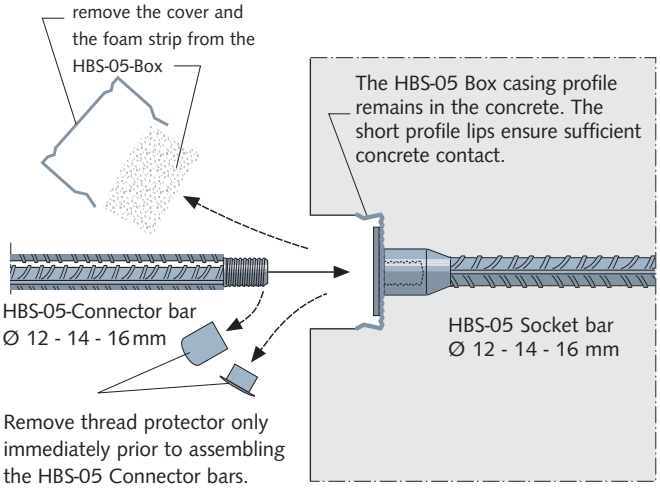
Bar d_s [mm]	Dimension min. x	
	for d_{BR} = 4 d_s [mm]	for d_{BR} = 10 d_s [mm]
12	95	131
14	109	151
16	124	172

$x_1 = x + 36$ mm

Installation:

1. Nail the HBS-05-Box to the formwork. Attach the HBS-05 bar ends to the reinforcement.
2. After striking the formwork: remove the cover and the foam strip from the HBS-05-Box





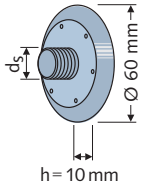
Remove thread protector only immediately prior to assembling the HBS-05 Connector bars.

HBS-05 Accessories

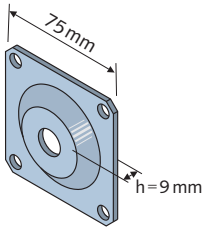
Attaching HBS-05-S Socket bars, straight or bent, to formwork

For timber formwork

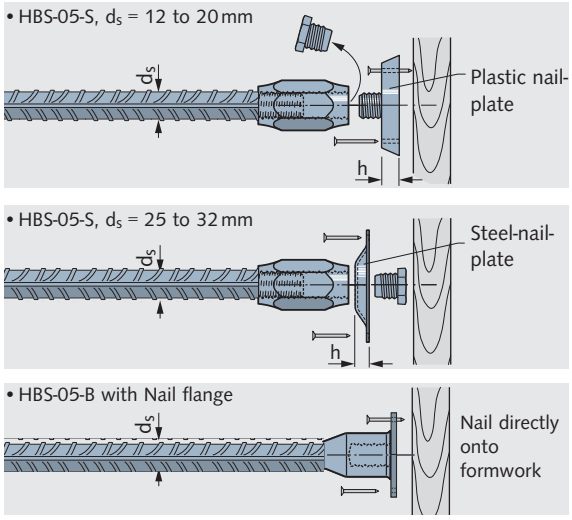
Plastic nail-plate
for d_s 12 - 20 mm



Steel nail-plate, zinc-plated
re-usable
for d_s 25 - 32 mm

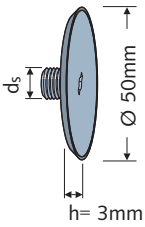


Fixing to timber formwork

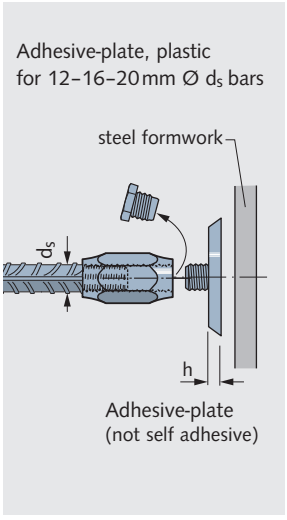


For steel formwork

Adhesive-plate, plastic
for d_s 12-16-20 mm

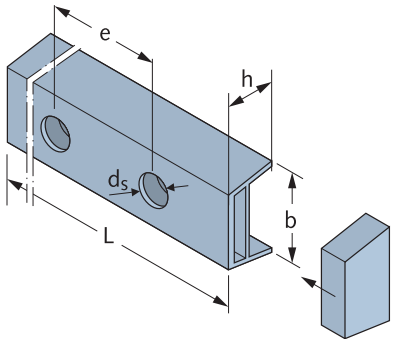


Fixing to steel formwork



Nail-plate, Adhesive-plate [mm]		
Article description	d_s	Order no.
Plastic nail-plate		0725.020-
HBS-05-12-KS	12	00002
HBS-05-14-KS	14	00003
HBS-05-16-KS	16	00004
HBS-05-20-KS	20	00005
Steel nail-plate		0725.030-
HBS-05-25-GV	25	00001
HBS-05-28-GV	26/28	00002
HBS-05-32-GV	32	00003
Adhesive-plate		0741.100-
6306-12	12	00002
6306-16	16	00003
6306-20	20	00004

Trapezoidal box for shear load bearing keyed joints (Fixing of connecting bars)



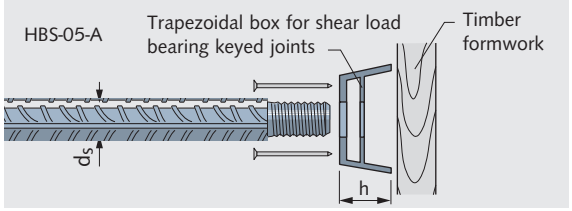
Trapezoidal Box [mm]			
Article description HBS-05-	h / b	for d_s	Order no.
TPL	35 / 60	12-20	0725.060
TPL	50 / 90	25-32	

① State dimensions of L, e and d_s when ordering

End cap for trapezoidal box [mm]			
Article description HBS-05-	h / b	for d_s	0725.070-
TPL-EDK	35 / 60	12-20	00001
TPL-EDK	50 / 90	25-32	00002

Standard bar spacings e [mm]		
e	Number of holes	L
75	13	1000
100	10	
125	8	
150	7	
200	5	
250	4	
300	4	
400	3	
450	3	
Other lengths on request		

Application example for reinforcment connection with R-L-socket → page 11.



Order example:

HBS-05-TPL-35/60-5 holes Ø16, e=200 mm

Type
Dimensions h / b [mm]
No. and diam. of holes
Hole spacing e [mm]

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