

HALFEN HBS-05 THREADED COUPLERS

Technical Product Information





We imagine, model and make engineered products and innovative construction solutions that help turn architectural visions into reality and enable our construction partners to build better, safer, stronger and faster.

Leviat is a world leader in connecting, fixing, lifting and anchoring technology.

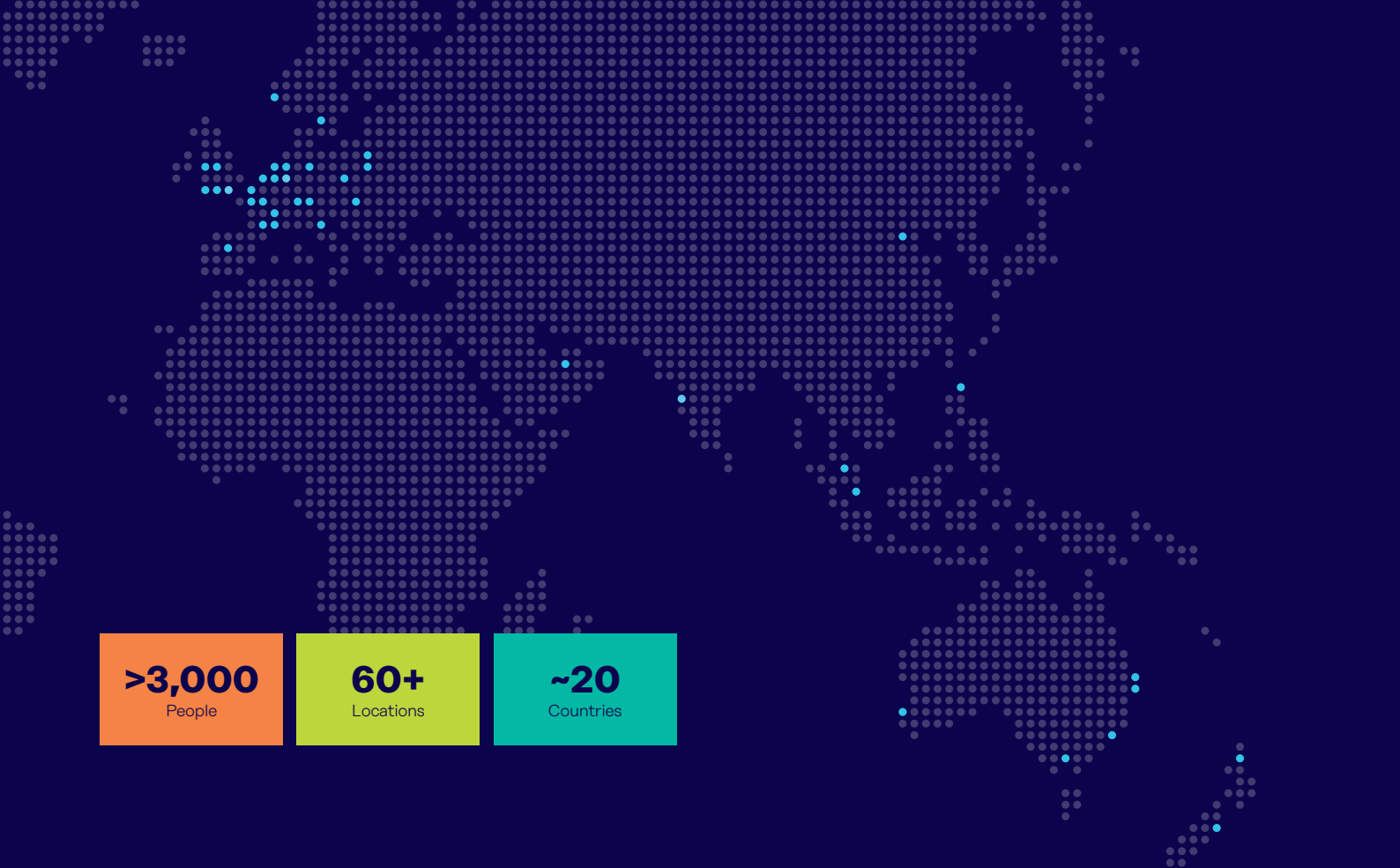
From the build of new schools, hospitals, homes and infrastructure, to the repair and maintenance of heritage structures, our engineering skills are making a difference around the world.

We provide technical design assistance at every stage of a project, from initial planning to installation and beyond.

Our technical support services range from simple product selection through to the development of a fully customised project-specific design solution.

Every promise we make locally, has the commitment and dedication of our global team behind it. We employ almost 3,000 people at 60 locations across North America, Europe and Asia-Pacific, providing an agile and responsive service worldwide.

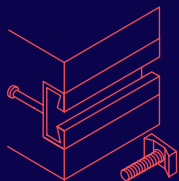




>3,000
People

60+
Locations

~20
Countries

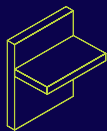


Anchoring & Fixing

Systems for fixing secondary fixtures to concrete, including anchor channels, bolts and inserts; also tension rod systems for roofs and canopies.

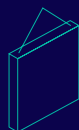
- Cast-in Channels, T-Bolts & Accessories
- Threaded Inserts
- Rod Systems
- Attachment Points
- Post Installed Anchor Systems

Other areas of expertise:



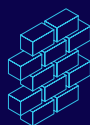
Structural Connections

Systems to form robust, efficient connections, and continuity of concrete reinforcement as necessary, between walls, slabs, columns, beams and balconies, providing structural integrity as well as enhanced thermal and acoustic performance.



Lifting & Bracing

Systems for the safe and efficient transportation, lifting and temporary bracing of cast concrete elements and tilt-up panels before permanent structural connections are made.



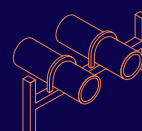
Façade Support & Restraint

Systems for the safe and thermally-efficient fixing of the external building envelope, including brick and natural stone, insulated sandwich panels, curtain walling and suspended concrete façades, and also the repair and strengthening of existing masonry installations.



Formwork & Site Accessories

Non-structural accessories that complement our engineered solutions and help keep your construction environment operating safely and efficiently, including moulds for casting standard and special concrete elements and construction essentials such as reinforcing bar spacers.



Industrial Technology

Mounting channels, pipe clamps and other versatile framing systems that provide safe fixing in a wide range of industrial applications.

Leviat product ranges:

Ancon | Aschwanden | Connolly | Halfen | Helifix | Isedio | Meadow Burke | Modersohn | Moment | Plaka | Scaldex | Thermomass

HALFEN HBS-05 THREADED COUPLER SYSTEM

General Overview

HALFEN HBS-05: The versatile threaded coupler

Reinforcement connections are made with the HALFEN HBS-05 Threaded coupler by simple screwing together of coupler bars and continuation bars. Using the wide range of available bars and couplers nearly every type of reinforcement connection can be created.

HALFEN HBS-05 fulfils national and international design standards. ETA 21/0800, extensive certificates and test reports prove suitability even for extreme circumstances:

- › High fatigue strength in bridge structures
- › Resistance to low cycle loading: alternating tension and compression representing seismic actions in violent earthquakes
- › Impact loads in nuclear power-stations

HALFEN HBS-05 Threaded couplers guarantee reliable planning and increased cost efficiency.

By using high-quality raw materials, and with the high manufacturing standards which are standard in our certified production facilities, the continuous reliability and quality of our products is ensured.



HBS-05 Coupler and continuation bars

Increased reliability in planning:

- › European Technical Assessment ETA 21/0800
- › General construction technique permit *DIBt no. Z-1.5-295
- › 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
- › ETA 21/0800 and numerous country-specific approvals, tests reports and certificates confirm compliance with the design criteria used in international standards
- › Exceptional load capacity: the HBS-05 fulfils 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 sleeves. A simple visual check is all that is required
- › An extensive range of accessories, pre-assembled coupler bars and formwork fixings save installation time and ensures optimal support in the formwork
- › Easy identification of matching couplers and connector bars using colour-coded screw plugs and protective caps
- › Numerous bending shapes according to customers requests: high precision from certified rebar bending plant
- › In combination with other reinforcement systems, HALFEN HSC, HALFEN HUC (see page 20-21)



Turning Torso in Malmö (Sweden)

*DIBt Deutsches Institut für Bautechnik = German Institute of Construction Engineering

HALFEN HBS-05 THREADED COUPLER SYSTEM

General Overview

HALFEN HBS-05: The versatile threaded coupler



European Technical Assessment ETA 21/0800

Performance and intended use of the extensive range of threaded coupler system HBS-05 is assessed independently according to European harmonized criteria based on regulation (EU) No. 305/2011 (construction products regulation). The essential characteristics of the product are declared in ETA 21/0800:

- fatigue strength
- resistance to static or quasi-static loading
- maximum slip under and after quasi-static loading
- resistance to seismic actions during violent earthquakes

ETA 21/0800 enables a wide range of possible applications. All types of HALFEN HBS-05 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 couplers — a simple visual check is all that is needed to ensure correct connection. The bar must be screwed completely into the coupler ensuring that the thread is not visible.

ETA 21/0800 is applicable in all EU member states. Furthermore, HALFEN HBS-05 fulfils the requirements of international design standards. Further information on types, their use and application possibilities for HALFEN HBS-05 Threaded coupler system with regards to national and international design regulations can be acquired from our Engineering support team. See back of this catalogue for contact addresses.



www.halfen.com ➤ brochures
➤ technical-product-information

General construction technical permit DIBt Z-1.5-295



The ETA 21/0800 evaluates the essential performance characteristics of the HBS-05 threaded coupler system based on the European harmonized test criteria. Furthermore the general construction technical permit Z-1.5-295 regulates how these characteristics are to be taken into account following national construction regulations when planning, dimensioning and executing reinforced concrete components. The verifications are carried out as for an unspliced rebar.

Under static or quasi-static tensile or compressive load the connection is evaluated as an unspliced rebar. Fatigue proofs are carried out with the stress range provided in ETA 21/0800. Limitation of crack width in accordance with EN 1992-1-1 is proven as for an unspliced rebar without taking thread slip into account. In addition Z-1.5-295 allows the use of HBS-05 under seismic loads in accordance with EN 1998-1, also with reinforcing steel B500B.

HALFEN HBS-05 THREADED COUPLER SYSTEM

General Overview

Declaration of performance

Constancy of performance and conformity:

The constancy of the product performance is constantly assessed by factory production control and independent third party control by certification authorities notified to the European Commission. Consistency of performance is certified following the strictest assessment system of the EU-construction products regulation (system 1+).



Essential characteristics

Negligible Slip

The thread slip is regularly determined during tensile tests on the HBS-05 connections. The ETA 21/0800 specifies two upper limit values for this: slip under static or quasi-static loading ($s_1 \leq 0.1 \text{ mm}$) and slip after quasi static load ($s_2 \leq 0.1 \text{ mm}$).

This means that slip does not affect the formation of cracks in the concrete. The crack width verification according to EN 1992-1-1 is carried out as for the unsplined rebar.

Fatigue strength

The values achieved for fatigue strength in HBS-05 Threaded couplers assure operational stability in structures that are subject to fatigue control, for example:

- Road-bridges
- Towers
- Foundations for machinery

Characteristic fatigue strength $\Delta\sigma_{RSK}$ for $N = 2 \cdot 10^6$ load cycles

$12 \leq \phi_{HBS} \leq 20 \text{ mm}$: $\Delta\sigma_{RSK} = 80 \text{ N/mm}^2$
$20 < \phi_{HBS} \leq 28 \text{ mm}$: $\Delta\sigma_{RSK} = 70 \text{ N/mm}^2$
$28 < \phi_{HBS} \leq 32 \text{ mm}$: $\Delta\sigma_{RSK} = 60 \text{ N/mm}^2$

Stress exponents of S-N-curve for N load cycles and $\phi_{HBS} \leq 28 \text{ mm}$

$N < 2 \cdot 10^6$:	$k_1 = 3.5$
$2 \cdot 10^6 \leq N \leq 10^7$:	$k_1 = 3.0$
$10^7 \leq N$:	$k_1 = 5.0$

Resistance in case of seismic actions

In accordance with ETA 21/0800, HALFEN HBS-05 meets the requirements for violent earthquakes as required by ISO 15835:2018 both for execution using reinforcement steel B500B and with the highest ductility class B500C. Therefore, the combination of highly ductile B500B reinforcement steel and the HBS-05 enables earthquake-proof structures wherever reinforcing steel of the highest ductility (B500C) has not yet been officially introduced. In addition, HALFEN HBS-05 Seismic with reinforcing steel B500C according to EN 1992-1-1 / BS 4449 offers maximum ductility.

Design for exceptional loads, for example; in nuclear power stations or in buildings that may be subjected to possible explosions or for impact loads, places high demands on the threaded coupler's ductility properties. This high level of ductility enables all variants in the HALFEN HBS-05 range to fulfil demands resulting from these effects—also includes shock loads.

HALFEN HBS-05 THREADED COUPLER

Load capacities

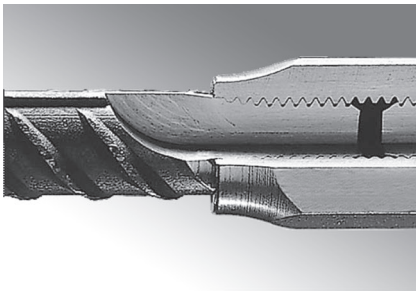
Forces (rebar) and ductility for HBS-05

Rebar loads F_{sd} for HBS-05 Coupler and continuation bars

Bar diameter [mm]	F_{sd} [kN]	Reinforcing steel bars			
		B 500 B		B 500 C	
		R_m/R_e	A_{gt} [%]	R_m/R_e	A_{gt} [%]
12	49.2	≥ 1.08	≥ 5.0	≥ 1.15 ≥ 1.35	≥ 7.5
14	66.9				
16	87.4				
20	136.6				
25	213.4				
28	267.7				
32	349.7				

Rebar loads $F_{sd} = A_s \cdot f_{yd}$ ($f_{yd} = f_{yk}/1.15$) in accordance with EN 1992-1-1

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.



Specification texts example

HALFEN HBS-05-S Threaded reinforcement bar, for tension and compression resistant connection of reinforcement bars. Includes a plastic protection cap.

In accordance with European Technical Assessment ETA 21/0800, suitable for predominantly static, non-predominantly static and exceptional loads.

HBS-05-S-20 / 1380

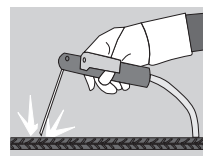
S = Coupler bar, 20 = diameter reinforcement bar [mm], B500B, M20 thread, thread depth $L_1 = 28.5$ mm, bar length $L = 1380$ [mm], or equivalent; deliver and install to formwork in accordance with the manufacturer's installation instructions.

HBS-05 Threaded couplers offers a number of bar shapes and combination possibilities. Leviaat can provide bent, cranked and straight bars (left-hand thread also available) or with weldable couplers to weld on to steel structures or with transition coupler 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 : Coupler bar with screw socket
- B : Coupler bar, forged, with nail flange
- A : Continuation bar
- L : Left-hand thread
- D : Double coupler bar
- AA : Double continuation bar
- G : Bent, bent $2 \times$ or cranked
- U : Bent $2 \times$ (only for double coupler bar SDU/BDU)
- E : Weld on end anchor
- EA : Weld on end anchor bar (fixed)
- RZ : Transition coupler
- w : Symbol for flash-butt welding

Notes



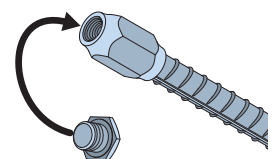
Flash-butt welding joints In accordance with DIN EN ISO 17660-1, are compulsory when manufacturing special-lengths or special-types in the factory, and if weld joints are required on HBS-05 Threaded connections.

The weld joints are marked with a 'w' in the construction drawing for each product.

DIN EN ISO 17660-1 regulations are valid for non-cyclic stresses. In accordance with ETA 21/0800 welding, in the case of fatigue-inducing cyclic stress, is only allowed for diameter ≤ 25 mm. Welding can also negatively influence the material properties. For this reason welding or applying heat to bend-areas is prohibited. DIN EN ISO 17660 must be observed.

See page 15 for notes on welding HBS-05-EA welding sockets to steel components.

HALFEN HBS-05 Couplers and continuation bars are delivered with colour-coded protection caps to prevent corrosion of the threads. Replace the caps after striking the formwork and remove only immediately prior to connecting the couplers and continuation bars.



HALFEN HBS-05 THREADED COUPLER SYSTEM

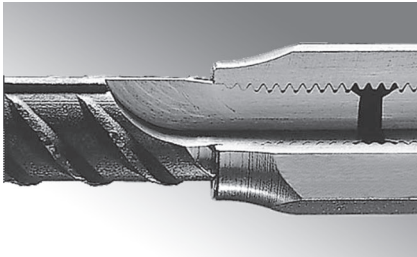
General Overview



HBS-05

Maximum ductility and optimised production technology

Using the best quality ductile materials combined with the best technology in thread manufacturing guarantees maximum ductility and safety in threaded coupler connections, even when subjected to violent earthquakes. 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.



The HALFEN HBS-05 Threaded coupler system offers high and maximum ductility respectively in ductility classes B500B and B500C, both of which meet the requirements applicable for violent earthquakes in accordance with ISO 15835:2018. The ductile behaviour of the threaded coupler system in alternating cyclic loads is an essential element when proving energy dissipation capability in seismic building components in accordance with EC8 (EN 1998-1) i.e. national Standards.

Bearing capacities and residual deformation in accordance with ETA 21/0800 in case of seismic actions enable earthquake-proof structures both for the design with reinforcing steel B500B and with the highest ductility class B500C. Connections with maximum ductility HBS-05-Seismic are made with of reinforcing steel B500C in acc. with EN 1992-1-1/ BS4449, highest ductility class. For more information please contact our technical support.



Project with HBS-05-Seismic: Leutschen Tower, Zürich

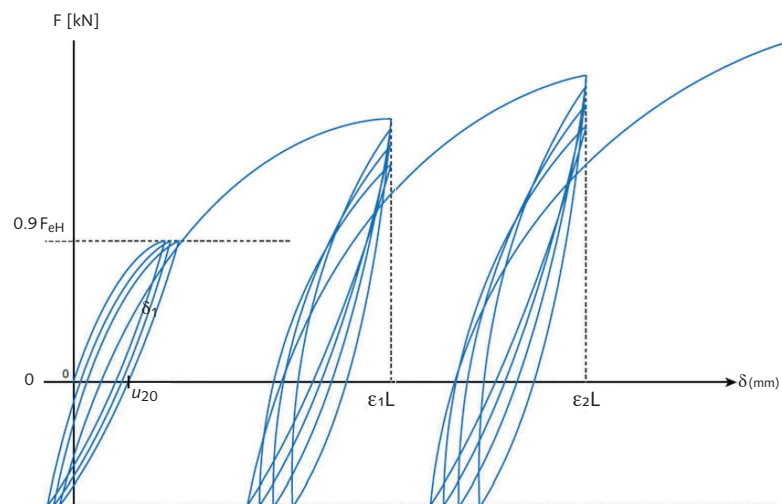


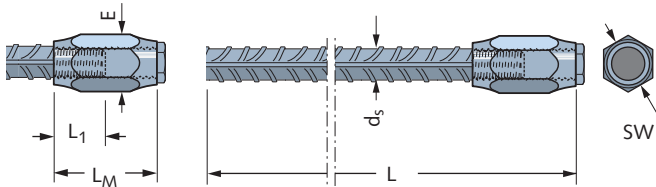
Diagram: result of a series of tests with HBS-05 Seismic under cyclic tensile and compressive loading in accordance with ISO 15835:2018.

- The stresses simulate a severe earthquake.
- The reinforcement connection is subjected to tension and compression forces in a multi-stage process, and subsequently pulled until failure.
- The cyclic test regime has an upper limit of $5 \epsilon_y$ (tension) and a lower limit of $-0.5 R_{eH}$ (compression).
- Permanent elongation u_{20} after 20 load cycles should not exceed 0.3 mm more than the equivalent residual elongation of an unsplined reference length from the same bar. The final breaking stress should be higher than $1.15 \times R_{eH}$. HBS-05 Seismic meets these requirements.

HALFEN HBS-05 THREADED COUPLER

Product Overview

HBS-05-S Coupler bars with screw socket



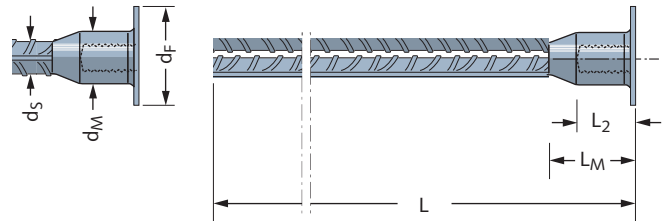
HBS-05-S Standard lengths [mm]

Reinforcing steel bars B 500 B in accordance with DIN 488-1

HBS-05-	Order no.	Dimensions						Weight kg/piece
Rebar d_s	L	0053.020-	Thread	L_1	L_M	SW	E	
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 × 3 Special thread	45.5	96	50	57.5	-

Other bar-lengths and bar shapes are available on request (→ pages 11-13).
① Please state required length when ordering.

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



HBS-05-B Standard lengths [mm]

Reinforcing steel bars B 500 B in accordance with DIN 488-1

HBS-05-	Order no.	Dimensions						Weight kg/piece
Rebar d_s	L	0053.010-	Thread	L_2	L_M	d_M	d_F	
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	44	25	49	0.758
	1110	00011						1.856
	1570	00012						2.583
	①...	-						-
B-20	400	00013	M20	30	51	31	57	1.210
	1380	00014						3.580
	①...	-						-
B-25	400	00016	M25 × 2.5 Special thread	39	71	39	63	1.929
	1730	00017						6.983
	①...	-						-
B-28	400	00019	M28 × 2.5 Special thread	44	73	44	69	2.395
	1930	00020						9.703
	①...	-						-

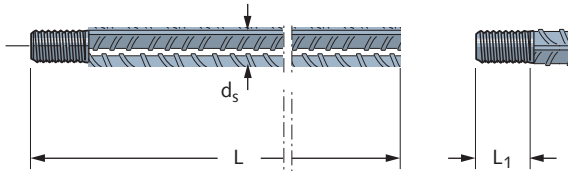
Other bar-lengths and bar shapes are available on request (→ page 11-13).
Special lengths may be delivery with resistance flash welded bar joints.
① Please state required length when ordering.

HALFEN HBS-05 Couplers and continuation bars are delivered with colour-coded protection caps and screw plugs. The corresponding colour-codes for the thread size are specified in the continuation bar tables.

HALFEN HBS-05 THREADED COUPLER

Product Overview

HBS-05-A Continuation bars



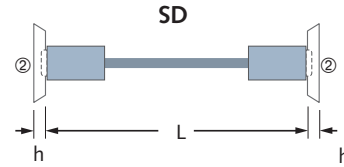
HBS-05-A Standard lengths [mm]						
Reinforcing steel bars B 500 B in accordance with DIN 488-1						
HBS-05-Rebar d_s	L	Order no.	Dimensions		Colour-code	Weight kg/piece.
		0053.030-	Thread	L_1		
A-12	380	00001	M12	16.5	green	0.337
	590	00002				0.524
	840	00003				0.746
	1160	00004				1.030
	① ...	-				-
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.
Continuation rebars with left-hand thread are available on request.
Other bar-lengths and bar shapes are available on request (→ pages 9-11)
① Please state required length when ordering.

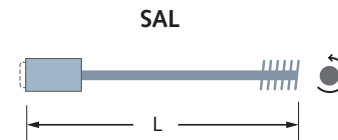
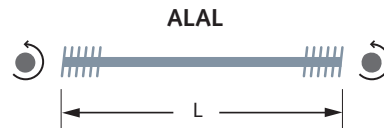
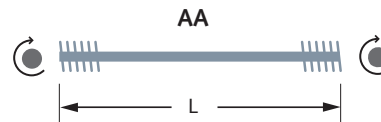
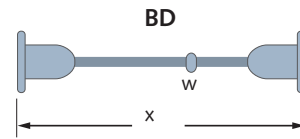
HBS-05 Product variations for straight bars

⌚ Right-hand thread

⌚ Left-hand thread



⚠ Nailing plate^②
h see page 17

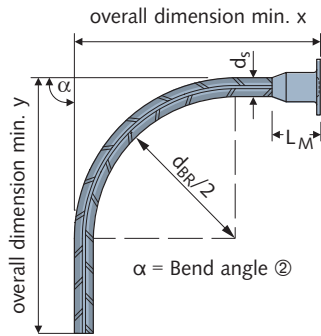


Min. length for double bars HBS-05 ... [mm]				
d_s	-AA, -ALA, ALAL	-SA/-SAL	-SD	-BD
12	150	180	205	210
14	150	180	210	220
16	150	185	215	220
20	150	190	230	265
25	180	230	275	300
28	200	255	305	325
32	220	280	340	-

② Make allowance for thickness h when using nailing-plates (→ page 17).

HALFEN HBS-05 THREADED COUPLER Bar Shapes

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



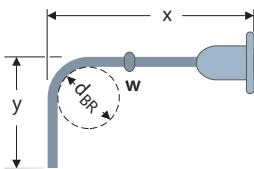
Order example:
Coupler bars BG, bent 1x
HBS-05-BG-16
x = 250 mm
y = 550 mm
d_{BR} = 10 d_s
α = 90°

min. x and min. y dimensions for bent coupler bars -BG [mm]								
Article description HBS-05-Rebar/d _s /x/y	Thread L _M	with mandrel 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

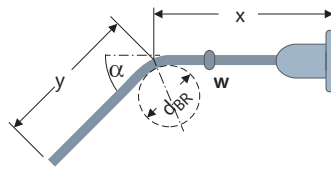
① State required lengths x and y in [mm] when ordering.
② If not stated otherwise when ordering, α = 90° will be delivered.

Examples of bar shapes:

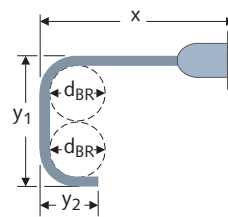
BG, 1x bent 90°



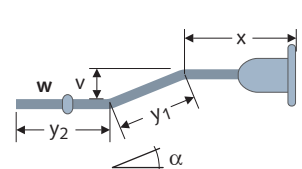
BG, 1x bent



BG, 2x bent^③

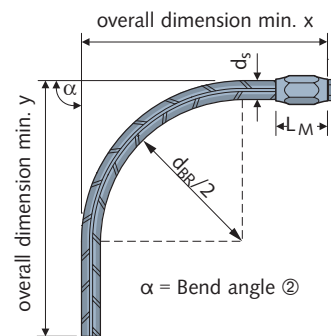


BG, cranked^③



③ Please include relevant drawings when ordering.

HBS-05-SG Bent bars with threaded coupler



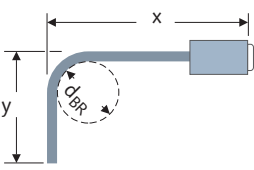
Order example:
Coupler bars SG, bent 1x
HBS-05-SG 16
x = 250
y = 1000
d_{BR} > 10 d_s
α = 90°

min. x and min. y dimensions for bent coupler bars -SG [mm]								
Article description HBS-05-Rebar/d _s /x/y	Socket L _M	with mandrel 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

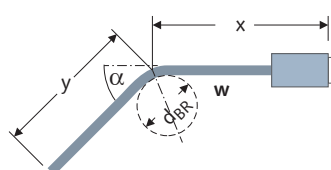
① State required lengths x and y in [mm] when ordering.
② If not stated otherwise when ordering, α = 90° will be delivered.

Examples of bar shapes:

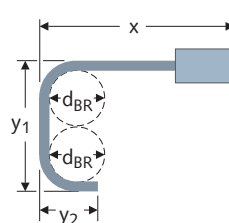
SG, 1x bent 90°



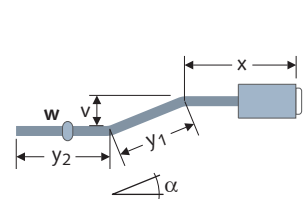
SG, 1x bent



SG, 2x bent^③



SG, cranked^③



③ Please include relevant drawings when ordering.

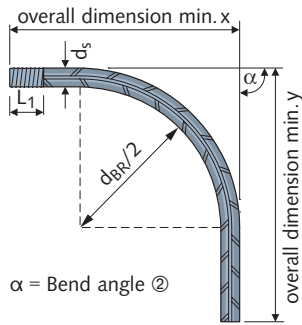
HALFEN HBS-05 THREADED COUPLER

Bar shapes

HBS-05-AG/-ALG Continuation bars bent

Continuation bars

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

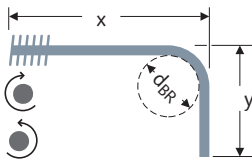


Order example:
Continuation bars AG, bent 1x
HBS-05-AG 16
 $x = 250$,
 $y = 1000$,
 $d_{BR} = 10 d_s$
 $\alpha = 90^\circ$

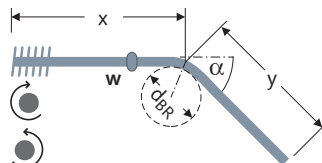
Bent continuation bars AG, -ALG [mm]								
Article description HBS-05- Rebar/ d_s /x/y	Thread L_1	for mandrel $\varnothing d_{BR}$						
		4 d_s		7 d_s		10 d_s	15 d_s	20 d_s
		min. x	min. y	min. x	min. y	min. x	min. x	min. x
AG - 12/①...	16.5	77	96	-	-	113	143	173
AG - 14/①...	19.5	90	112	-	-	132	167	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, $\alpha = 90^\circ$ will be delivered.

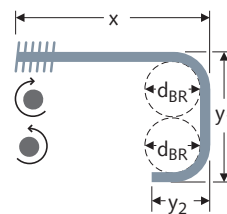
AG/ALG, 1x bent 90°



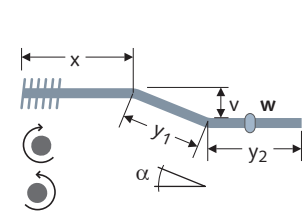
AG/ALG, 1x bent



AG/ALG, 2x bent^③



AG/ALG, cranked^③



③ Please include relevant drawings when ordering.

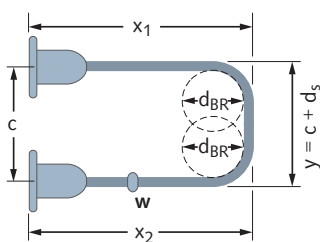
HBS-05

Order example: **Double coupler bar BDU, bent 2x**
HBS-05-BDU 16; $x_1 = 350$, $x_2 = 350$, $y = 300$, $c = 284$, $d_{BR} = 10 d_s$

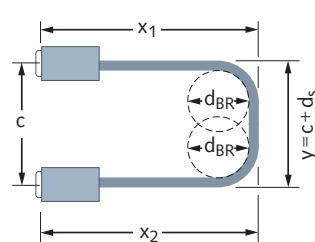
⚠ c = axial spacing

Order example: **Double continuation bar AAG, bent 2x**
HBS-05-AAG 16; $x_1 = 750$, $x_2 = 750$, $y = 300$, $c = 284$, $d_{BR} = 10 d_s$
 The default is a right-hand thread, please specify if a left-hand thread is required.

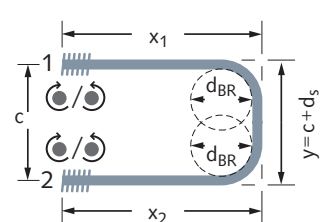
BDU



SDU



AAG



HBS-05 BDU min. lengths

d_s	4 d_s		7 d_s		10 d_s		15 d_s		20 d_s	
	min. x	min. c	min. x	min. c	min. x	min. c	min. x	min. c	min. x	min. c
12	95	89	113	132	131	176	161	248	191	320
14	109	101	130	151	151	202	186	286	221	370
16	124	112	148	170	172	228	212	324	252	420
20	-	-	181	208	211	280	261	400	311	520
25	-	-	233	255	271	345	333	495	396	645
28	-	-	255	283	297	384	367	552	437	720
32	-	-	-	-	-	-	-	-	-	-

HBS-05 SDU/AAG min. lengths

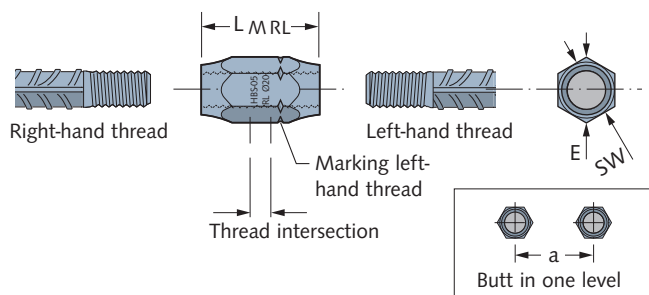
d_s	4 d_s		7 d_s		10 d_s		15 d_s		20 d_s	
	min. x	min. c	min. x	min. c	min. x	min. c	min. x	min. c	min. x	min. c
12	96	89	114	132	132	176	162	248	192	320
14	112	101	133	151	154	202	189	286	224	370
16	128	112	152	170	176	228	216	324	256	420
20	-	-	190	208	220	280	270	400	320	520
25	-	-	237	255	275	345	337	495	400	645
28	-	-	266	283	308	384	378	552	448	720
32	-	-	304	320	352	436	432	628	512	820

HALFEN HBS-05 THREADED COUPLER

HBS-05 R-/L- Sleeve

HBS-05-R-/L- Coupler - Right/Left coupler

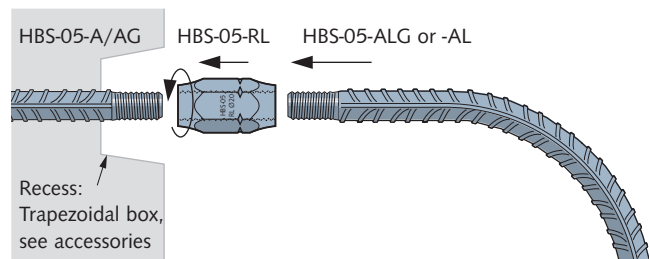
Right/left-hand coupler sleeve with overlapping counter threads to connect a non-rotatable connection bar with a left-hand thread for example (HBS-05-ALG bent) to a fixed connection bar with right-hand thread.



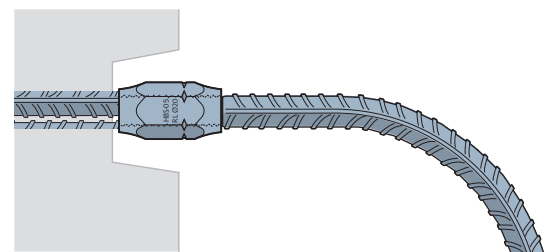
Right/Left coupler [mm]					
Article description HBS-05-Rebar - d _s	Order no.	Dimensions			
		L _{MRL}	a _{min.}	SW	E
RL - 12	00001	38	42	19	21.9
RL - 14	00002	44	46	22	25.4
RL - 16	00003	50	48	24	27.7
RL - 20	00004	62	55	30	34.6
RL - 25	00005	77	67	36	41.6
RL - 28	00006	86	76	41	47.3
RL - 32	00007	98	90	50	57.7

Installation

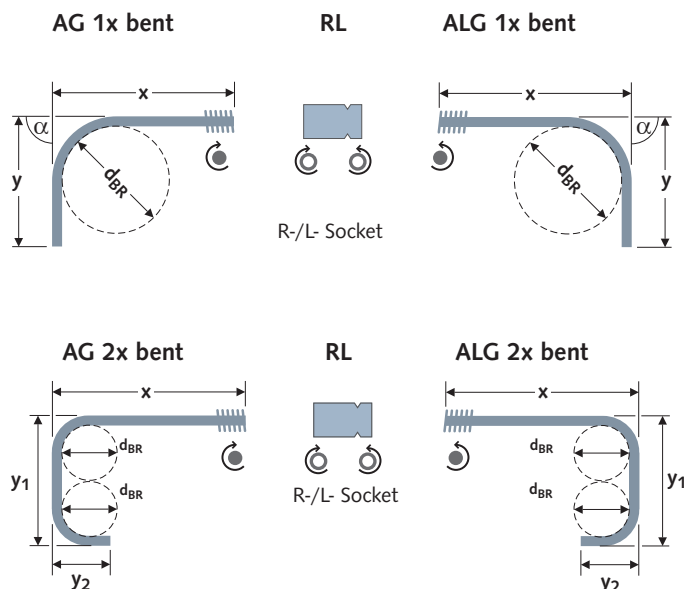
Prior to installation



After installation



Application example:



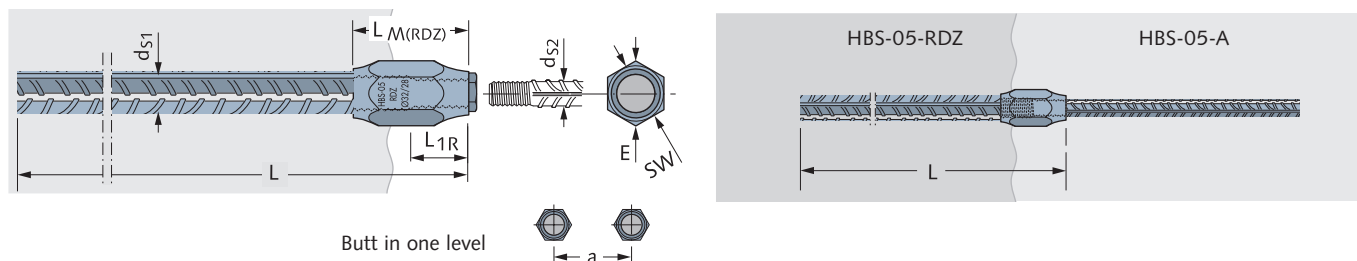
Order example:

Type HBS-05-RL - 20
Thread $\varnothing$ resp. bar $\varnothing$ _____

HALFEN HBS-05 THREADED COUPLER

Transition coupler bars

HBS-05-RDZ Transition coupler

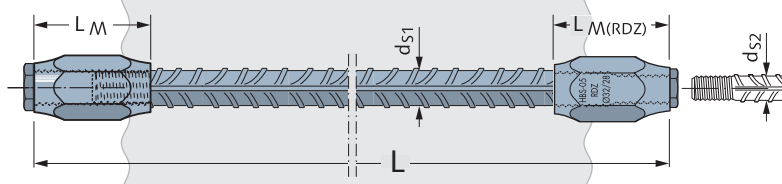


HBS-05-RDZ [mm]

Article description HBS-05 rebar d_{s1} / d_{s2} - L	Order no.	Dimensions						
		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-SRZ Double coupler rebar, one end with transition coupler



Also available cranked

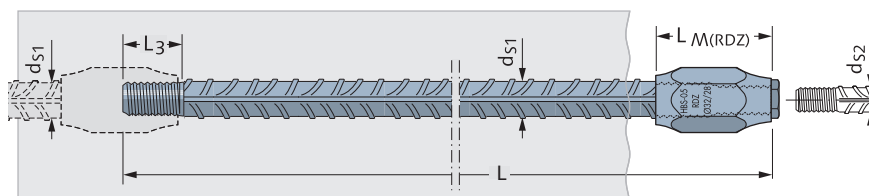
Couplers can be ordered separately.

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 continuation bar with transition coupler



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.

Minimal lengths for transition bars -RDZ /-ARZ [mm]

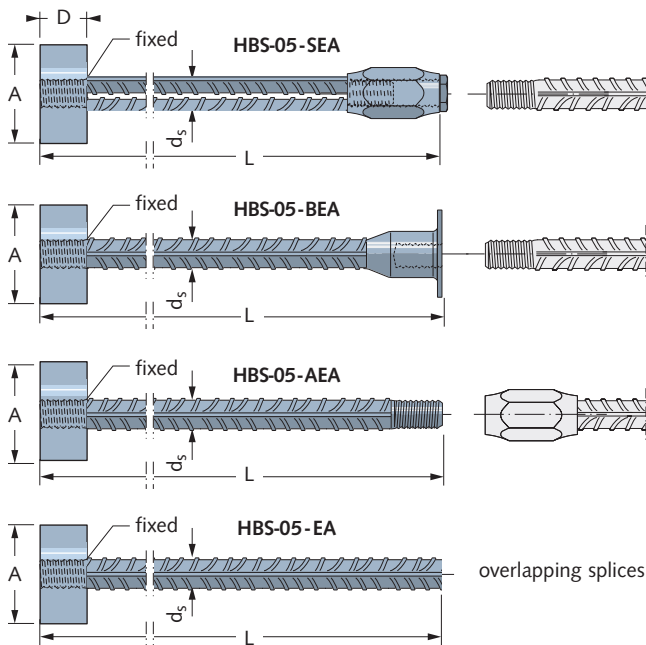
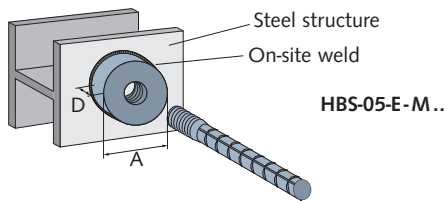
d_s	12	14	16	20	25	28	32
-ARZ	180	180	185	190	230	255	280
-SRZ	205	210	215	230	275	305	340

① Make allowance for thickness h (→ page 19) when using nailing-plates.

HALFEN HBS-05 THREADED COUPLER

Weldable EA coupler

HBS-05-EA/-E Bar with weldable coupler / loose weldable coupler



Order example: - (weldable) coupler bar **HBS-05- E** - **M20**

- coupler bar, **HBS-05- SEA** - **20** / **740**
 Type _____
 Thread ϕ or bar ϕ _____
 Bar length $\times$ [mm] _____

Recommended: The amount of metal can be considerably reduced by using forged anchor-heads as end anchors in concrete.

With the HSC Stud connector we offer building authority approved reinforcement with forged anchor-heads for use as end anchors in concrete. (→ page 20)



Our free design software is available for efficient planing. Download under www.halfen.com

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

The weldable coupler according ETA 21/0800 is especially for attaching bars HBS-05 onto steel constructions by welding. They are available either as loose couplers (HBS-05-E) or assembled in connection with an HBS-05 continuation bar of your choice. Static verifications (e.g. weld seam) are required for the respective application (material: S235 according to EN 10025-2).

During welding, the company responsible for construction must observe EN 1090-1, EN ISO 9606-1 and EN 15609-1 guide-lines. Suitable corrosion protection for the application must be applied for the steel component and the coupler. See EN ISO 12944-5.

HBS-05-EA connectors can also be used for end anchoring in concrete. For this application we recommend a design as illustrated on page 16.

HBS-05-EA with pre-fitted continuation bar [mm]

Article description HBS-05-rebar/ d_s / L	Dimensions		
	Thread	A	D
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 $\times$ 2.5 ②	80	35
EA-28 / ①...	M28 $\times$ 2.5 ②	90	40
EA-32 / ①...	M32 $\times$ 3.0 ②	110	45

① State required length L [mm] when ordering.

② Special thread

Minimal lengths for double coupler/connector bars HBS-05 ... [mm]

d_s	-SEA; -BEA	-AEA
12	180	150
14	180	150
16	185	150
20	190	150
25	230	180
28	255	200
32	280	220

① Make allowance for thickness h (→ page 17) when using nailing-plates.

For connections with steel constructions, weldable HBS-05-EA couplers are available.

DIN EN 1090-1, DIN EN ISO 9606-1 and DIN EN ISO 15609-1 must be observed when welding. In this case, proof of conformity must be provided by the building contractor. The installation instructions notes in ETA 21/0800, annex B2 and Z-1.5-295 apply.

HALFEN HBS-05 THREADED COUPLER

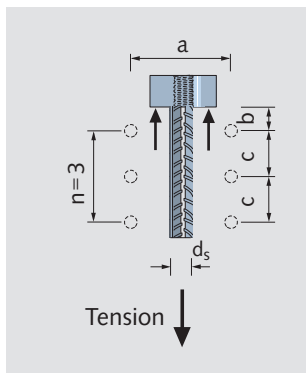
End anchors

End anchorage using HBS-05-EA: Additional reinforcement

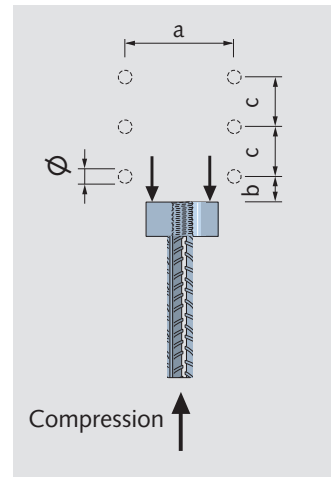


Additional reinforcement is recommended for applications using end anchorage with weldable coupler bars.

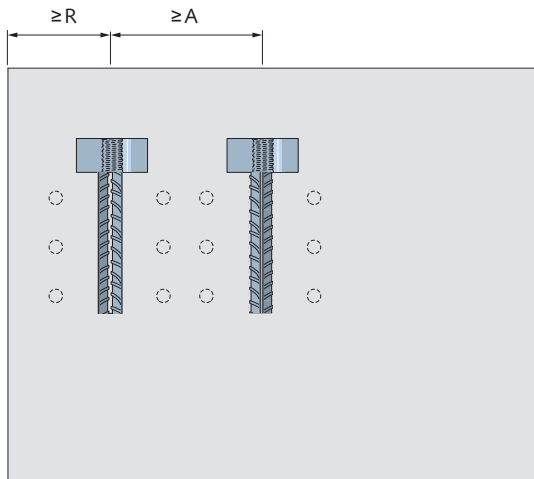
With tension loads



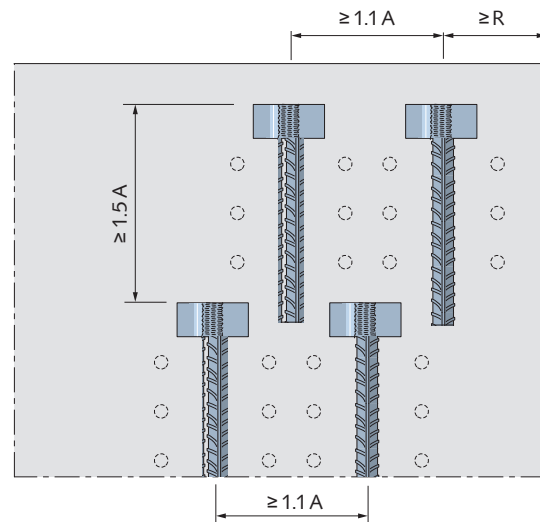
With compression loads



Non-staggered anchorage



Staggered anchorage



Additional reinforcement — Dimensions

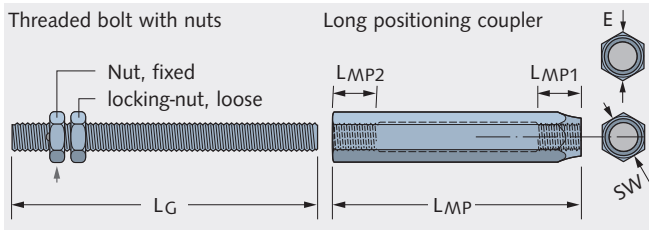
HBS-05 Ø Nominal diameter d _s mm	Axial spacing A mm	Edge spacing R mm		Additional reinforcement				
		≥ a/2 + Ø diameter of additional reinforcement + c _{nom}		Number of rods n	Diameter Ø mm	a mm	b mm	c mm
10-14	85			3	6	60	20	28
16	100			3	6	70	20	30
20	130			4	6	100	20	32
25	145			4	6	120	15	41
28	170			3	8	140	10	41
30	190			3	8	155	20	50

HALFEN HBS-05 THREADED COUPLER

HBS-05 Positioning Coupler

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

Set consists of:



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

Materials:

- positioning coupler: 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 coupler serves as a connection between axial fixed and non-rotatable reinforcing bars for example:

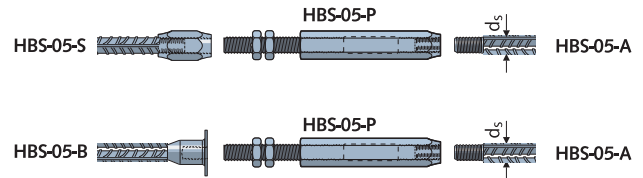
- in areas between previously concreted sections such as a crane opening in floor slabs
- connecting precast reinforcing cages
- connection between difficult to access rebars

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

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

Combinations with positioning coupler HBS-05 - P

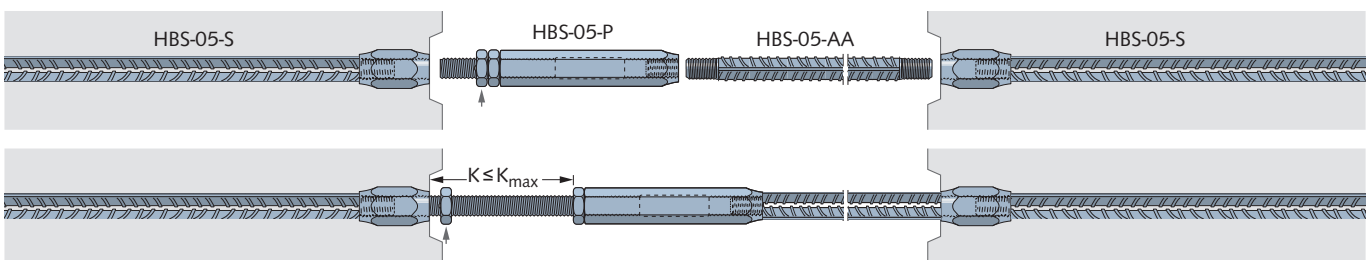
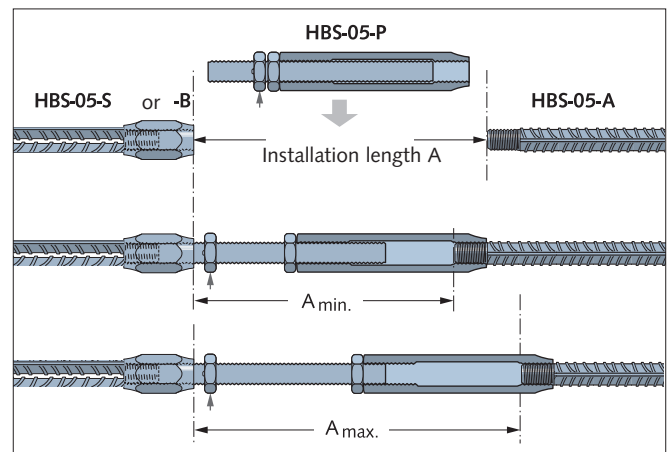
Loose end anchor HBS-05-E (Dimensions see table -EA)



Installation dimensions for standard length positioning couplers [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	240	300	150	80
314	283	344	170	100
336	305	366	179	140
385	350	419	206	190

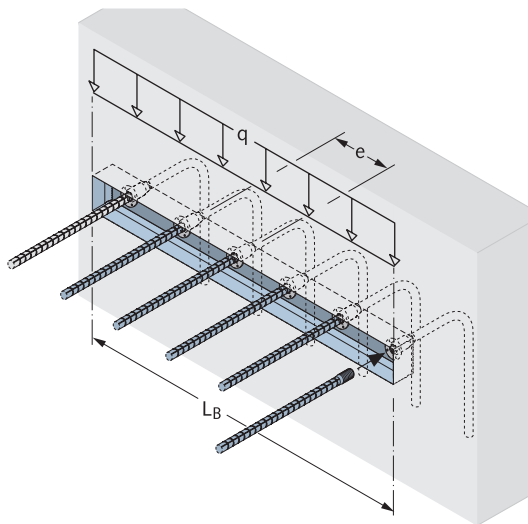
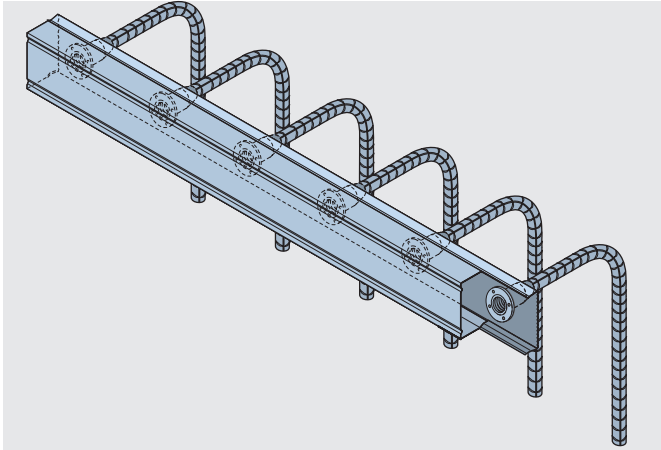
Adjusting installation length A



HALFEN HBS-05 THREADED COUPLER

HBS-05-Box

HBS-05-Box with coupler rebars



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

① For diameter 16 mm the no. of rebars is limited to 10 per box!

The HBS-05 Box is similar to the HALFEN Rebend connection HBT 55 casing.

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] _____

No. of bars/Box, Type HBS-05 Coupler bars _____

Dimensions of HBS-05 Socket bars _____

Mandrel 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 couplers are available in 12 - 14 - 16 mm bar diameters pre-assembled in a steel casing

Areas of application:

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

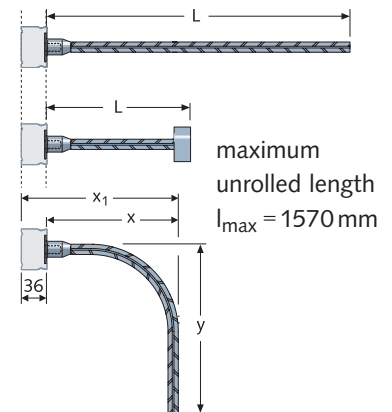
The HBS-05 Connection

HBS-05-B → Page 9
straight

HBS-05-BEA → Page 15
anchor bar

HBS-05-BG → Page 11
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 ^①	124	172



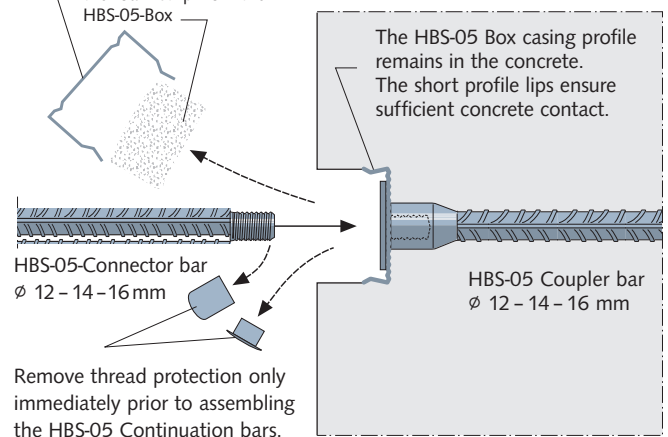
$$x_1 = x + 36 \text{ mm}$$

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



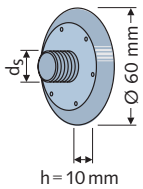
HALFEN HBS-05 THREADED COUPLER

HBS-05 Accessories

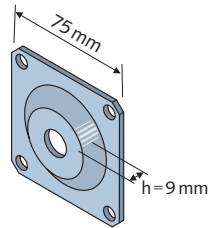
Attaching HBS-05-S Coupler bars, straight or bent, to formwork

For timber formwork

Plastic nail-plate
for d_s 12 – 20 mm

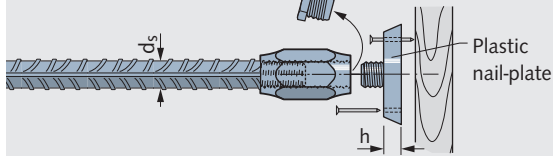


Steel nail-plate, zinc-plated
re-usable
for d_s 25 – 32 mm

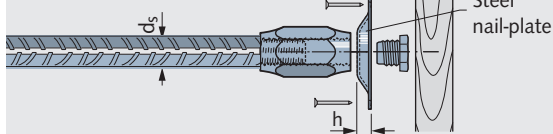


Fixing to timber formwork

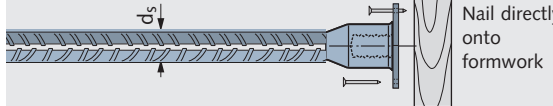
- HBS-05-S, $d_s = 12 - 20$ mm



- HBS-05-S, $d_s = 25$ to 32 mm

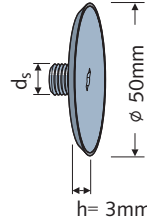


- HBS-05-B with Nail flange



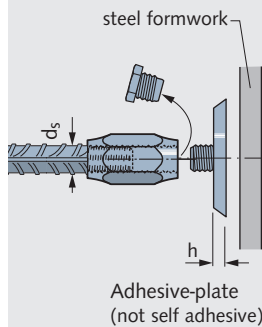
For steel formwork

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



Fixing to steel formwork

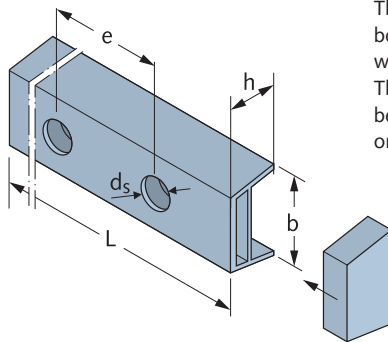
Adhesive-plate, plastic
for 12–16–20 mm $\varnothing d_s$ bars



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 continuation bars)



The trapezoidal box can be ordered without holes. The holes can also be individually cut on-site if preferred.

Trapezoidal Box [mm]

Article description	h / b	for d_s	Order no.
HBS-05-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]

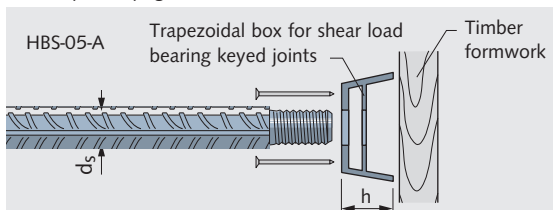
Article description	h / b	for d_s	Order no.
HBS-05-TPL-EDK	35 / 60	12 – 20	0725.070-
TPL-EDK	50 / 90	25 – 32	

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 reinforcement connection with R-L coupler → page 13.



Order example:

HBS-05-TPL-35/60-5 holes $\varnothing 16$, e=200 mm

Type _____

Dimensions h / b [mm] _____

No. and diam. of holes _____

Hole spacing e [mm] _____

HALFEN HBS-05 THREADED COUPLER

Compatible HALFEN Products

Reinforcement anchorage using HALFEN HSC Stud Connectors

The HALFEN HSC Stud Connectors, manufactured with ribbed reinforcement steel with a rectangular anchor head.

HALFEN HSC Stud Connector $\phi 12$, 14, 16, 20 and 25mm with a load bearing surface of the anchor head of about eight times the bar diameter are intended to be used for anchorage of bar tensile forces, in reinforced concrete elements with small dimensions or dense reinforcement.

As an alternative to conventional anchorage types in accordance with EN 1992-1-1, anchor heads can be used to reduce the anchorage length and simplify the structural design of the components with reinforcement. For certain components, such as corbels, higher load-bearing capacities are achieved under otherwise identical conditions.

In structures with concreting sections and a construction joint to the column, the Stud Connector can be used with the HALFEN HBS-05 Reinforcement Screw Connector.

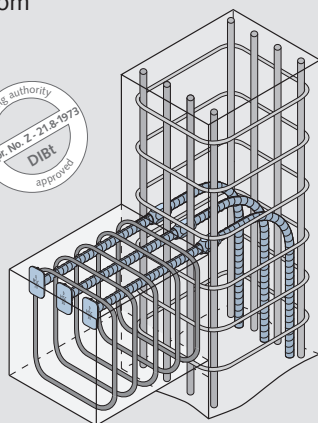
Advantages:

- Reinforcement steel with rectangular anchor head
- National technical approval / General construction technique permit Z-21.8-1973
- Reinforced concrete elements in accordance with EN 1992-1-1
- Static, quasi-static and fatigue-effective loads
- Easy-to-use calculation software for custom design solutions
- Design concepts for corbels, exterior beam-column joints beams and slabs
- Design concept for construction joints of secondary concrete components, for example: Beam or corbels, cast on to a column in a second concrete section
- Reduced component dimensions and high load-bearing capacities due to anchor head anchoring
- Alternative for end anchoring using hooks, stirrups or welded cross bars

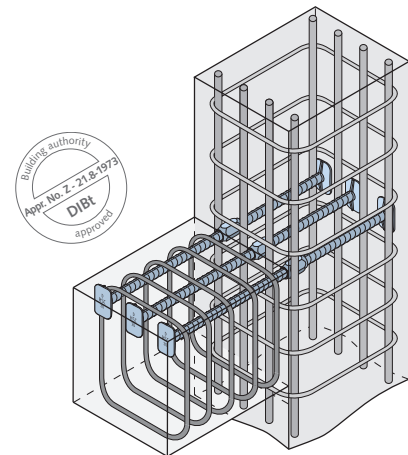
Corbels using HALFEN HSC Stud Connectors

DiBt approval Z-21.8-1973 allows a possible combination of the HBS-05 and HSC systems.

HALFEN HSC Stud Connector
Download at www.halfen.com



HSC Corbel used in combination with
HALFEN HBS-05 Screw connections



Please use our HSC Calculation software!
Download at www.halfen.com

HALFEN HBS-05 THREADED COUPLER

Compatible HALFEN Products

Steel connections with the HALFEN HUC Universal connection

HALFEN HUC Universal connections are used for load bearing steel connections to reinforced concrete components

HALFEN HSC-B Stud Connector with internally threaded sockets. M12, M14, M16, M20 and M27 are intended to be used in fastenings (connection of steel construction elements to concrete construction elements) Used for reliable transfer of loads into reinforced concrete.

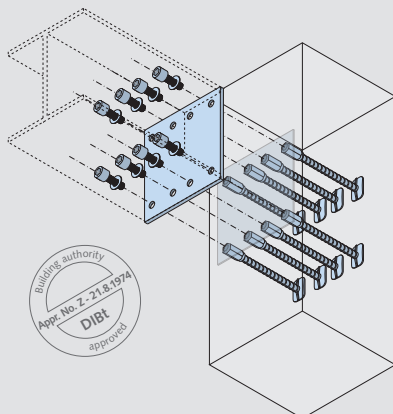
The structural steel elements are fastened with metric ISO bolts in accordance with EN 1993-1-8. The requirements for the transfer of anchor loads from the reinforced concrete components to the supports are specified in EN 1992-1-1.

To optimize the anchorage length, the socket anchors can be anchors with HSC anchor heads. The type approved HALFEN HSCC Steel corbel connections complete the range.

The HALFEN HUC Universal Connection

A high-performance system for load application in concrete components with bolted connections.

HALFEN HSC Universal Connection
Download at www.halfen.com



Advantages:

- Reinforcement steel with connection couplers for steel bolts
- General building authority approval / general construction technique permit Z-21.8-1974
- Reinforced concrete elements in accordance with EN 1992-1-1
- Steel components and bolts in accordance with EN 1993-1-1, EN 1993-1-4 and EN 1993-1-8
- Static, quasi-static and fatigue-effective loads
- Easy-to-use calculation software for custom design solutions
- Design concept for fixing of corbels and steel end-plates to concrete components
- Corrosion protection or A4 stainless steel for different fields of application
- Wide range of assessories and type tested HALFEN HSCC Steel consoles with CE marking in accordance with EN 1090-1/-2 (EXC2)
- High load capacity
- High planning reliability and connection accuracy for steel construction
- Alternative to on-site welding to anchor plates

The HSC-B Connector is designed for large loads, reliable transfer of tension loads, shear loads and bending moments. The HSC-B Socket bars with and without end anchors is described in detail in our Technical Product Information HALFEN HUC Universal connection.



Please use our **HUC** Calculation software!
Download at: www.halfen.com



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