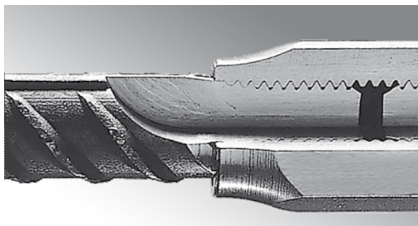


HALFEN HBS-05 SEISMIC Product Information

Ductility class C

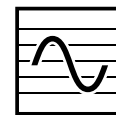
HALFEN HBS-05 Seismic provides the highest ductility from the product range of the HALFEN Threaded couplers and therefore it also meets the requirements defined in ISO 15835:2018 for severe earthquakes. The ductile behaviour of the screw connection in alternating cyclic loads is an essential element when proving energy dissipation capability in seismic building components in accordance with EC8 (EN 1998-1) i.e. national Standards. HBS-05-Seismic Threaded connections are made of reinforcement steel B500C acc. to EN 1992-1-1/ BS4449, highest ductility class. For more information please contact our technical support.

Highest ductility and best technology

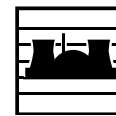


The bolt threads are cold formed; the resulting surface compression increases the hardness of the thread. The conical shaping at the bar-tip guarantees a tight fit of the bar and reduces the notch sensitivity. Using the best quality ductile materials combined with the best technology in thread manufacturing guarantees maximum ductility and safety in the screw connection, even under the effects of large earthquakes.

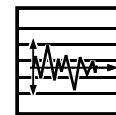
logy in thread manufacturing guarantees maximum ductility and safety in the screw connection, even under the effects of large earthquakes.



Suitable also for non-pre-dominantly static loads



Approved for exceptional loads



Fulfils requirements for buildings in earthquake endangered zones



Tested with ISO 15835 standard

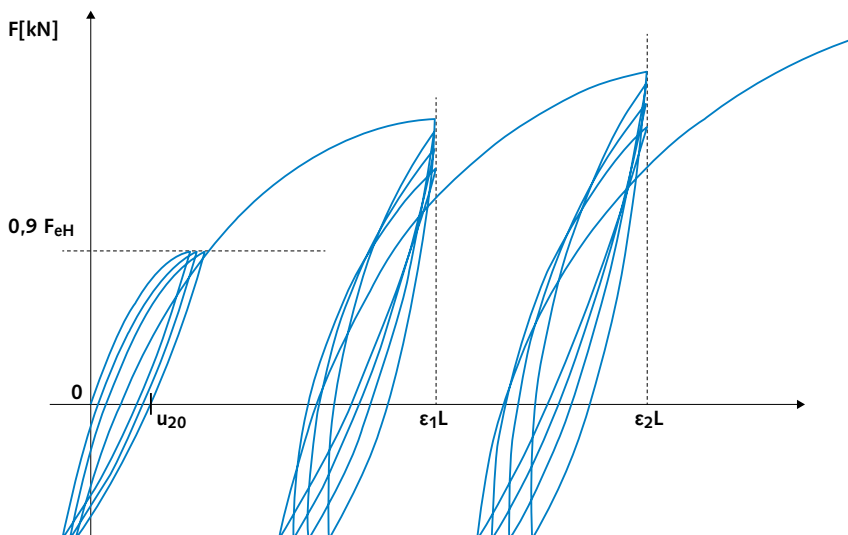


Diagram: result of a series of tests with HBS-05 Seismic under cyclic tensile and compressive loading according to ISO 15835:2018. The stresses are simulating a severe earthquake. The reinforcement connection is alternating loaded with tension and compression forces in a multi-stage procedure and finally pulled until failure. The cyclic test regime has an upper bound of $5\epsilon_y$ (tension) and a lower bound of $-0.5 R_{eH}$ (compression). The permanent elongation u_{20} after 20 load cycles should not exceed 0,3 mm more than the equivalent residual elongation of an unspliced reference length from the same bar and the finally breaking stress should be higher than $1.15 R_{eH}$. HBS-05-Seismic provides these requirements.

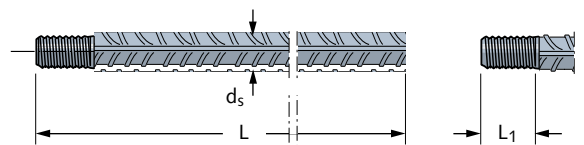
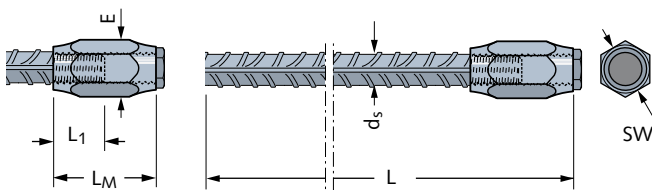
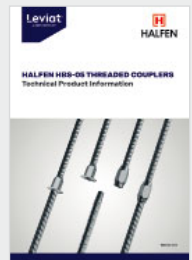


HBS-05 Couplers and connecting rebars

HALFEN HBS-05 SEISMIC DUCTILITY CLASS C

Dimensions/load capacities

We recommend to use the Technical Product Information HALFEN HBS-05 as a supplementary design document. The catalogue contains all accessories and additional design variations which are available in ductility class C on request. The accessories for fixing to formwork are matching in both systems. **Reducing coupler bar, positioning coupler, double coupler or connecting bars, HBS-05 box, end anchor, trapezoidal box, nailing plates ...** Please contact our technical support at www.halfen.com.



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...



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

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

Rebars B 500 C according to requirements of EN 1992-1-1/BS4449

HBS-05-Rebar d_s	L	Order no.	Dimensions				
			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 x 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 bend shapes are available on request.
① Please state required length when ordering.

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

Rebars B 500 C according to requirements of EN 1992-1-1/BS4449

HBS-05-Rebar d_s	L	Order no.	Dimensions		Colour-code
			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 x 2.5 Special thread	36.0	brown
A-32-Seismic ① ...			M32 x 3 Special thread	45.5	blue

Other bend shapes are available on request.
① Please state required length when ordering.

Forces (rebar) F_{sd} for HBS-05 Socket and connecting bars B 500 C

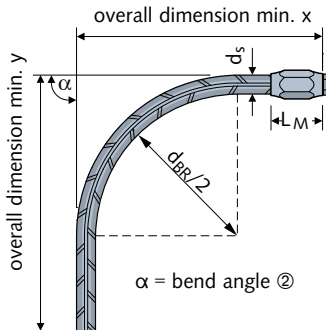
Reinforcing steel bars B 500 C according to requirements of EN 1992-1-1/BS4449

Bar diameter [mm]	F_{sd} [kN]	R_m/R_e	A_{gt} [%]
12	49,2	$\geq 1,15$ $< 1,35$	$\geq 7,5$
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

HALFEN HBS-05 SEISMIC DUCTILITY CLASS C

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



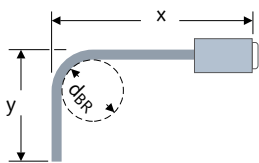
Order example:
Socket bars Seismic SG, bent 1x
HBS-05-Seismic-SG 16
 $x = 250,$
 $y = 1000,$
 $d_{BR} = 10 d_s$
 $\alpha = 90^\circ$

min. x and min. y dimensions for bent socket bars -SG [mm]		with bending roll $\varnothing d_{BR}$:						
Article description HBS-05-Seismic Rebar/ d_s /x/y	Socket L_M	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
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-32/①...	96	-	-	304	304	352	432	512

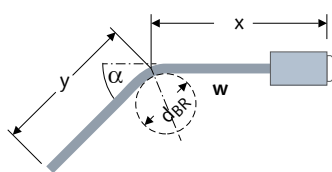
① State required lengths x and y in [mm] when ordering.
 ② If not stated otherwise when ordering, $\alpha = 90^\circ$ will be delivered.

Examples of bend shapes:

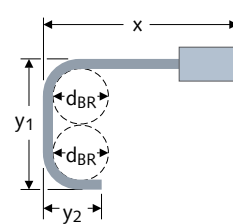
SG, 1x bent 90°



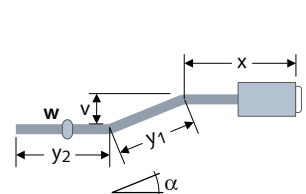
SG, 1x bent



SG, 2x bent ③



SG, cranked ③

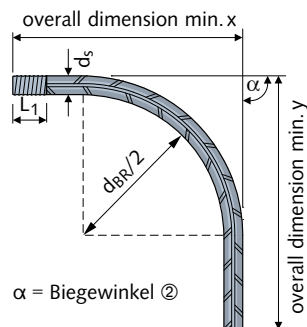


③ Please include relevant drawings when ordering.

HBS-05-Seismic-AG/-ALG Connecting bars bent

Connecting bars

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

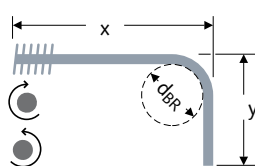


Order example:
Connecting bar AG, 1x bent
HBS-05-AG 16
 $x = 250,$
 $y = 1000,$
 $d_{BR} = 10 d_s$
 $\alpha = 90^\circ$

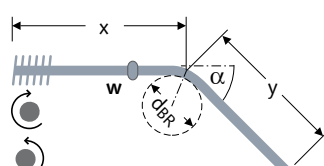
bent connecting bars -AG, -ALG [mm]		for bends $\varnothing d_{BR}$						
Article description HBS-05-Seismic Rebar/ d_s /x/y	Thread L_1	4 d_s		7 d_s		10 d_s	15 d_s	20 d_s
		min. x	min. y	min. x	min. y	min. x	min. x	min. x
AG - 12/①...	16,5	77	96	-	-	113	143	173
AG - 14/①...	19,5	90	112	-	-	132	167	202
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 - 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.

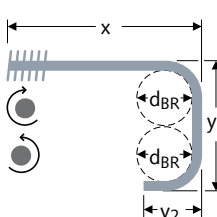
AG/ALG, 1x bent 90°



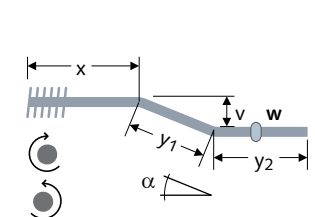
AG/ALG, 1x bent



AG/ALG, 2x bent ③



AG/ALG, cranked ③



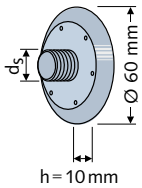
③ Please include relevant drawings when ordering.

HALFEN HBS-05 SEISMIC DUCTILITY CLASS C

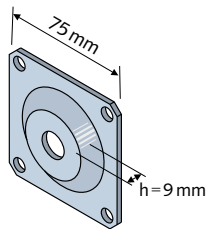
Attaching HBS-05-S Coupler bars, straight or bent, to formwork

For wood formwork

Plastic nail-plate for d_s 12 - 20 mm

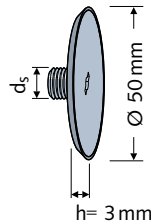


Steel nail-plate, zinc-plated re-usable for d_s 25 - 32 mm

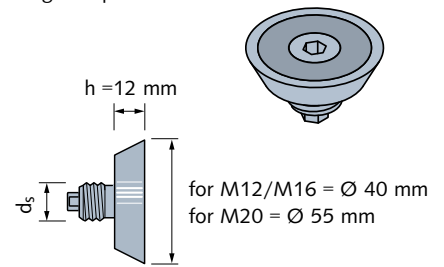


For steel formwork

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

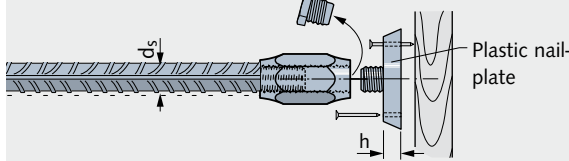


Magnetic plate

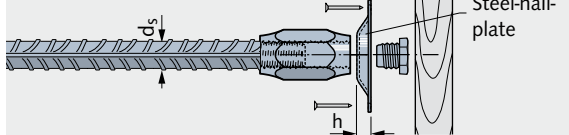


Fixing to timber formwork

• HBS-05-S, d_s = 12 - 20 mm

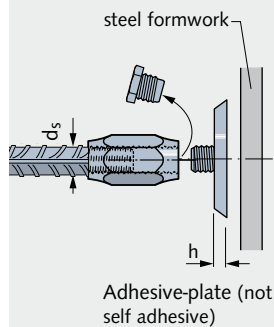


• HBS-05-S, d_s = 25 - 32 mm



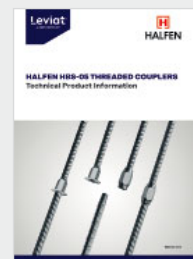
Fixing to steel formwork

Adhesive-plate, plastic; or magnetic-plate for 12-16-20 mm $\varnothing d_s$ bars



Nail-plate, Adhesive-, Magnetic-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-05-32-GV	32	00003
Adhesive-plate		0741.100-
6306-12	12	00002
6306-16	16	00003
6306-20	20	00004
Magnetic-plate		0741.180-
6365 - 12	12	00001
6365 - 16	16	00002
6365 - 20	20	00003

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Leviat

Please contact Leviat for more information on these products. Full contact details are available online at Leviat.com.

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