Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

Member of EOTA
www.eota.eu

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-24/0687 of 23 August 2024

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Leviat mechanical splicing system Grout Coupler
Product family to which the construction product belongs	Couplers for mechanical splices of reinforcing steel bars
Manufacturer	Leviat GmbH Liebigstraße 14 40764 Langenfeld GERMANY
Manufacturing plant	Leviat GmbH, Werk Artern Otto-Brünner-Straße 3 06556 Artern Leviat GmbH, Plant Artern Otto-Brünner-Straße 3 06556 Artern
This European Technical Assessment contains	17 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 160129-01-0301

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

Specific part

1 Technical description of the product

The Leviat mechanical splicing system Grout Coupler is used as a system for connecting reinforcing bars in reinforced concrete components under static or quasi-static, fatigue and low cycle loading.

The product description is given in Annex A.

The characteristic material values, dimensions and tolerances of Leviat mechanical splicing system Grout Coupler not indicated in Annexes A1 to A6 shall correspond to the respective values laid down in the technical documentation[1] of this European technical assessment.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the Leviat mechanical splicing system Grout Coupler is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the Leviat mechanical splicing system Grout Coupler of at least 100 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Resistance to static or quasi-static loading	See Annex C1 and C2
Slip under static or quasi-static load	See Annex C1 and C2
Slip after static or quasi-static load	See Annex C1 and C2
Fatigue strength for N = $2 \cdot 10^6$ load cycles	See Annex C1 and C2
Fatigue strength for S-N curve with k_1 and k_2 according to EN 1992-1-1	No performance assessed
Fatigue strength for S-N curve with specific k_1 and k_2	No performance assessed
Resistance to low cycle loading (seismic actions)	See Annex C1 and C2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1

[1] The technical documentation of this European technical assessment is deposited at the Deutsches Institut für Bautechnik and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure, is handed over to the approved bodies.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD 160129-01-0301 the applicable European legal act is: 2000/606/EC.
The system to be applied is: 1+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

The following standards and assessments are referred to in this European Technical Assessment:

EN 196-1:2016	Methods of testing cement - Part 1: Determination of strength
EN 206:2013+A2:2021	Concrete - Specification, performance, production and conformity
EN 1504-6:2006	Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 6: Anchoring of reinforcing steel bar
EN 1563:2018	Founding - Spheroidal graphite cast irons
EN 1992-1-1:2004 + AC:2010 + A1:2014	Eurocode 2 - Design of concrete structures - Part 1-1: General rules and rules for buildings, bridges and civil engineering structures
EN 1998-1:2004 + AC:2009 + A1:2013	Eurocode 8: Design of structures for earthquake resistance - Part 1: General rules, seismic actions and rules for buildings
EN 12350-5:2019	Testing fresh concrete - Part 5: Flow table test
EN 12390-16:2019	Testing hardened concrete - Part 16: Determination of the shrinkage of concrete
EN 13395-2:2002	Products and systems for the protection and repair of concrete structures - Test methods - Determination of workability - Part 2: Test for flow of grout or mortar
EN ISO 17660-1:2006	Welding - Welding of reinforcing steel - Part 1: Load-bearing welded joints (ISO 17660-1:2006)
ETA-21/0800	HALFEN HBS-05 threaded coupler system, 6. December 2021
GB/T 1348:2019	Spheroidal Graphite Iron Castings

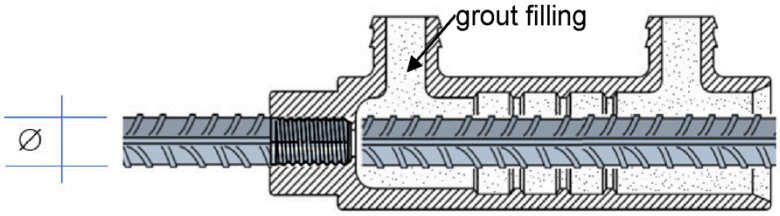
Issued in Berlin on 23 August 2024 by Deutsches Institut für Bautechnik

Beatrix Wittstock
Head of Section

beglaubigt:
Kisan

A.1 Design variants Grout Coupler connections

Basic principle of mechanical splices with Half Grout Coupler (HGC)



Basic principle of mechanical splices with Full Grout Coupler (FGC)

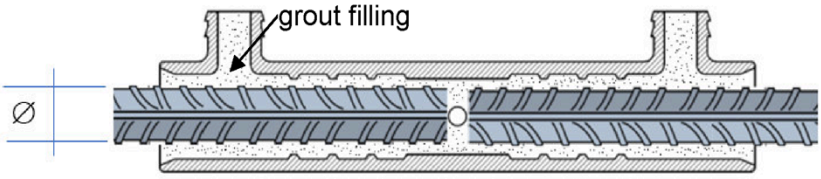


Table A1 Design variants

Connections with	Annex	∅										
		12	14	16	18	20	22	25	26	28	30	32
HGC	A5	B,R,H,J	B,R,H,J	B,R,H,J	B,J	B,J	B,J	B,J	B,J	B,J	B,J	B,J
FGC	A6	B,R,H,J	B,R,H,J	B,R,H,J	B,J	B,J	B,J	B,J	B,J	B,J	B,J	B,J

B: B500B

R: B500B NR

H: B500B product made of reinforcing steels in coils

J: B500C

Permitted welding joint B500:

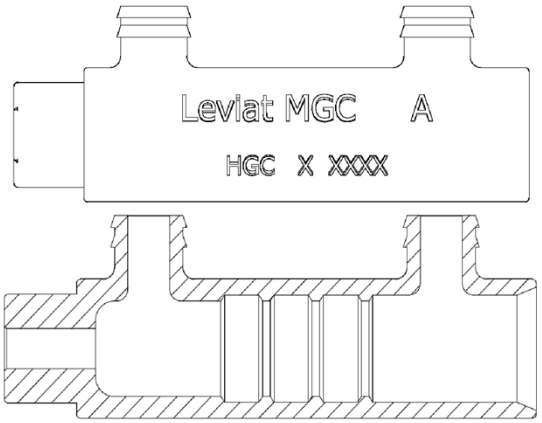
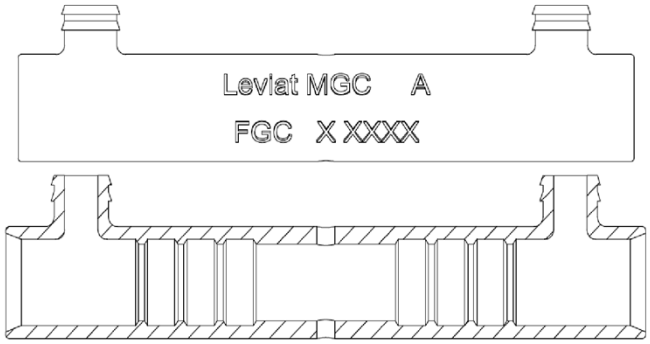
butt joint in accordance with EN ISO 17660-1, welding process 24 – flash butt welding

(under fatigue load only for ∅ ≤ 25 mm)

Leviat mechanical splicing system Grout Coupler	Annex A1
Product description System overview, design variants	

A.2 System overview installation elements

Table A2: Installation elements of Grout Coupler connections

Designation	Illustration	Type	Material
Half Grout Coupler		GR-MGC-ST-HA CI (HGC)	A
Full Grout Coupler		GR-MGC-ST-HA CI (FGC)	A
Threaded connecting bar		HBA-05-A	B, J
Unthreaded connnecting bar			B, J
Grout			G

A: EN-GJS-500-7 (QT-500-7) EN 1563 (GB/T 1348) (material no.. 5.3200)
B: B500B ; J: B500C, G: cementitious grout EN 1504-6 acc. table A.3
HBS-05-A acc. ETA-21/0800

Table A3: Grout characteristics

characteristic			Standard	remark
Proof of performance	DoP , CE		EN 1504-6	
Compressive strength (24 h)	$R_{c,k\,(1d)}$	≥ 40 MPa	EN 196-1	prism
Compressive strength (28 d)	$R_{c,k\,(28d)}$	≥ 75 MPa	EN 196-1	prism
Compressive strength class	C	≥ C 60/75	EN 206	cylinder/cube
flowability (5 min)	$f_{(5min)}$	≥ 550 mm	EN 13395-2	
shrinkage (91d, 20°C, 65% rel. humidity)	$\varepsilon_{s,m,91}$	≤ 0,8 ‰	EN 12390-16	mean value
	$\varepsilon_{s,i,91}$	≤ 1,0 ‰		single value

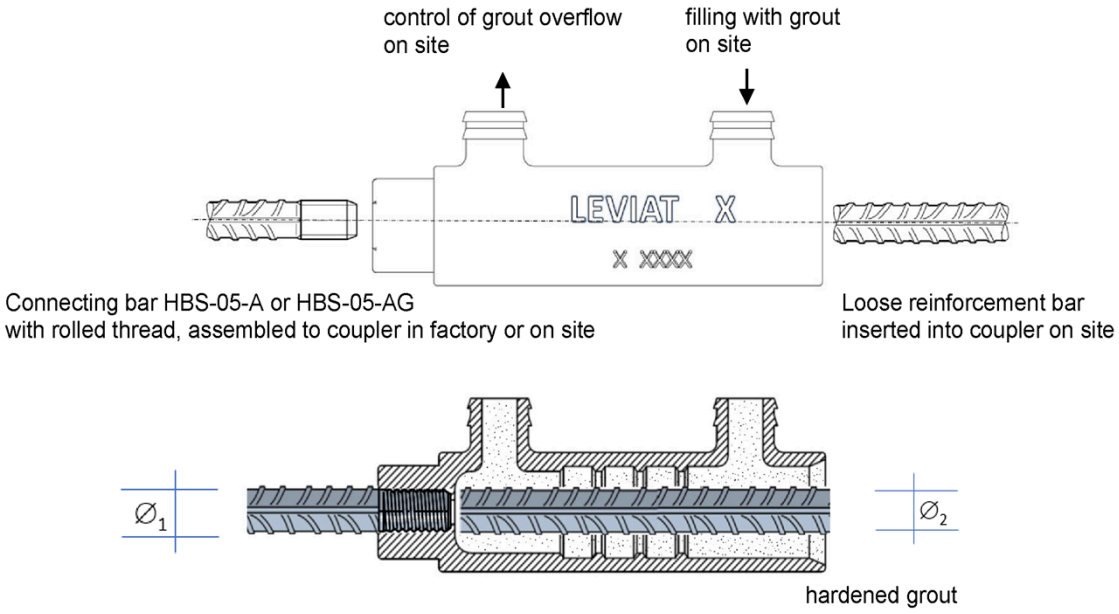
Leviat mechanical splicing system Grout Coupler

Product description
System overview: installation elements

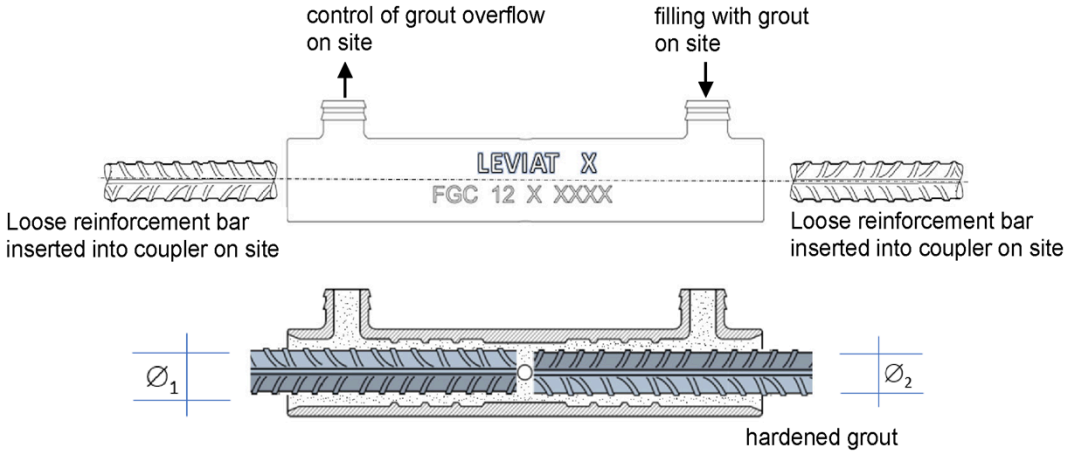
Annex A2

A.3 Installation principle

Connection with Half Grout Coupler



Connection with Full Grout Coupler



Assembly rule:

Threaded side:
Threaded bar ends shall be screwed into the coupler with the entire thread length
A wrench with torque display is not required

Open side:
loose bars should be inserted into the coupler until stop (tolerance 20 mm)

Grout filling:
The force-fit connection of loose bars is created by grouting with a grout according to table A.3.
The grout is pured into one of the filler necks until it emerges frome the second neck.

Leviat mechanical splicing system Grout Coupler	Annex A3
Product description Installation principle	

Deutsches Institut für Bautechnik DIBt

A.4 Installation principle: bar-coupler-combinations

Splices with Half / Full Grout Coupler

Table A4: Possible combinations of bar diameter and coupler size: overview

		$\varnothing_2$										
		12	14	16	18	20	22	25	26	28	30	32
$\varnothing_1$	12	A,B	B	B								
	14	B	B,C	B,C	C	C						
	16	B	B,C	B,C,D	C,D	C,D	D	D	D			
	18		C	C,D	C,D	C,D	D	D	D			
	20		C	C,D	C,D	C,D	D	D	D			
	22			D	D	D	D,E	D,E	D,E	E	E	E
	25			D	D	D	D,E	D,E	D,E	E	E	E
	26			D	D	D	D,E	D,E	D,E	E	E	E
	28						E	E	E	E	E	E
	30						E	E	E	E	E	E
	32						E	E	E	E	E	E,F

Possible combinations of bar diameter and coupler size: coupler sizes A / B / C / D / E / F

A

$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12	X										
14											
16											
18											
20											
22											
25											
26											
28											
30											
32											

B

$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12	x	x	x								
14	x	X	X								
16	x	X	X								
18											
20											
22											
25											
26											
28											
30											
32											

C

$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12											
14		x	x	x	x						
16		x	x	x	x						
18		x	x	X	X						
20		x	x	X	X						
22											
25											
26											
28											
30											
32											

D

$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12											
14											
16			x	x	x	x	x	x			
18			x	x	x	x	x	x			
20			x	x	x	x	x	x			
22			x	x	x	X	X	X			
25			x	x	x	X	X	X			
26			x	x	x	X	X	X			
28											
30											
32											

E

$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12											
14											
16											
18											
20											
22						x	x	x	x	x	x
25						x	x	x	x	x	x
26						x	x	x	x	x	x
28						x	x	x	X	X	X
30						x	x	x	X	X	X
32						x	x	x	X	X	X

F

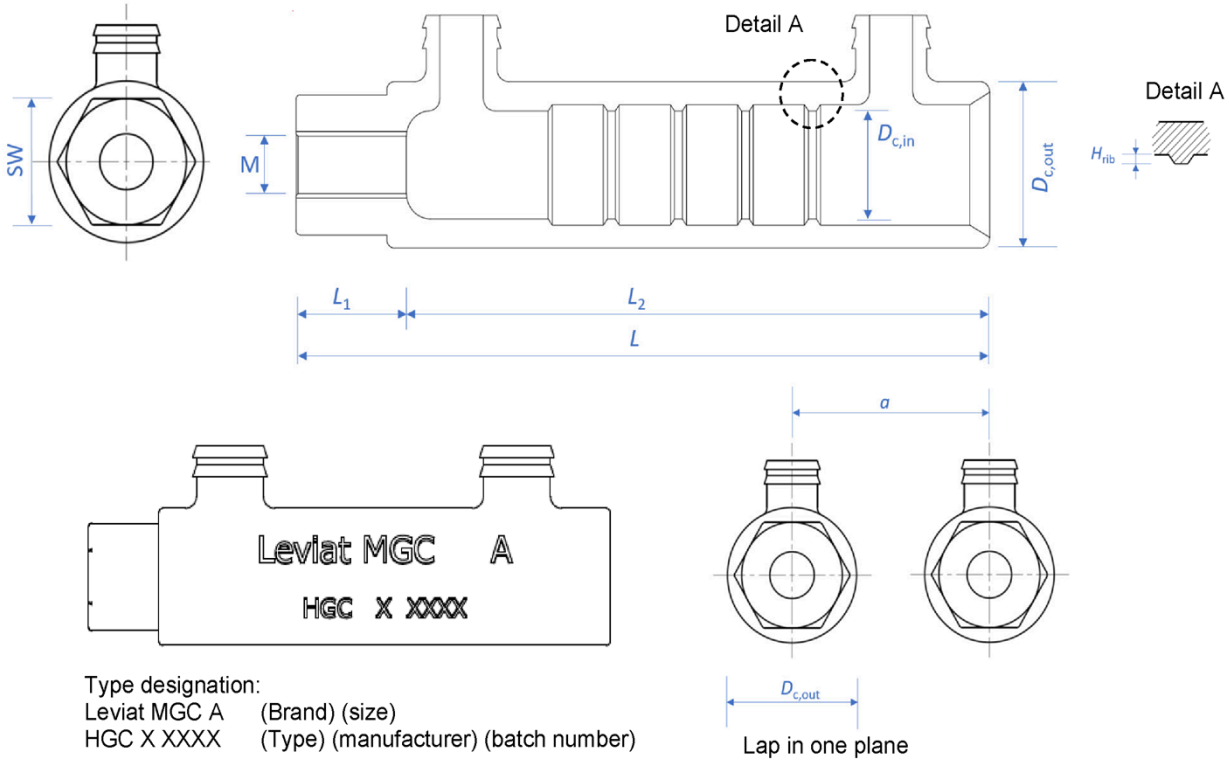
$\varnothing_1$ \ $\varnothing_2$	12	14	16	18	20	22	25	26	28	30	32
12											
14											
16											
18											
20											
22											
25											
26											
28											
30											
32											X

(x) possible combinations
(**X**) standard-combinations
Coupler types A to F according to table A5 and A6

Leviat mechanical splicing system Grout Coupler	
Product description Installation principle: bar-coupler-combinations	Annex A4

Deutsches Institut für Bautechnik DIBt

Half-Grout Coupler



Type designation:
Leviat MGC A (Brand) (size)
HGC X XXXX (Type) (manufacturer) (batch number)

Lap in one plane

Table A5: Dimensions of Half Grout Coupler (material acc. annex A2, all dimensions in [mm])

size	L	L_1	L_2	$D_{c,out}$	$D_{c,in}$	H_{rib}	SW	$a^{1)}$
A	140	24	116	35	24	1,5	24	55
B	176	28	148	40	26	1,5	30	60
C	211	31	180	46	30	2	36	66
D	259	39	220	55	35	2	46	75
E	325	49	276	71	45	3	55	91
F	401	61	340	86	54	3	70	106

1) The spacing required for installation shall be observed

Table A6: Thread sizes M per bar diameter

bar-∅ [mm]	12	14	16	18	20	22	25	26	28	30	32
M	M12x1,75	M14x2	M16x2	M18x2,5	M20x2,5	M22X2,5	M25x2,5	M26x2,5	M28x2,5	M30x3,5	M32x3

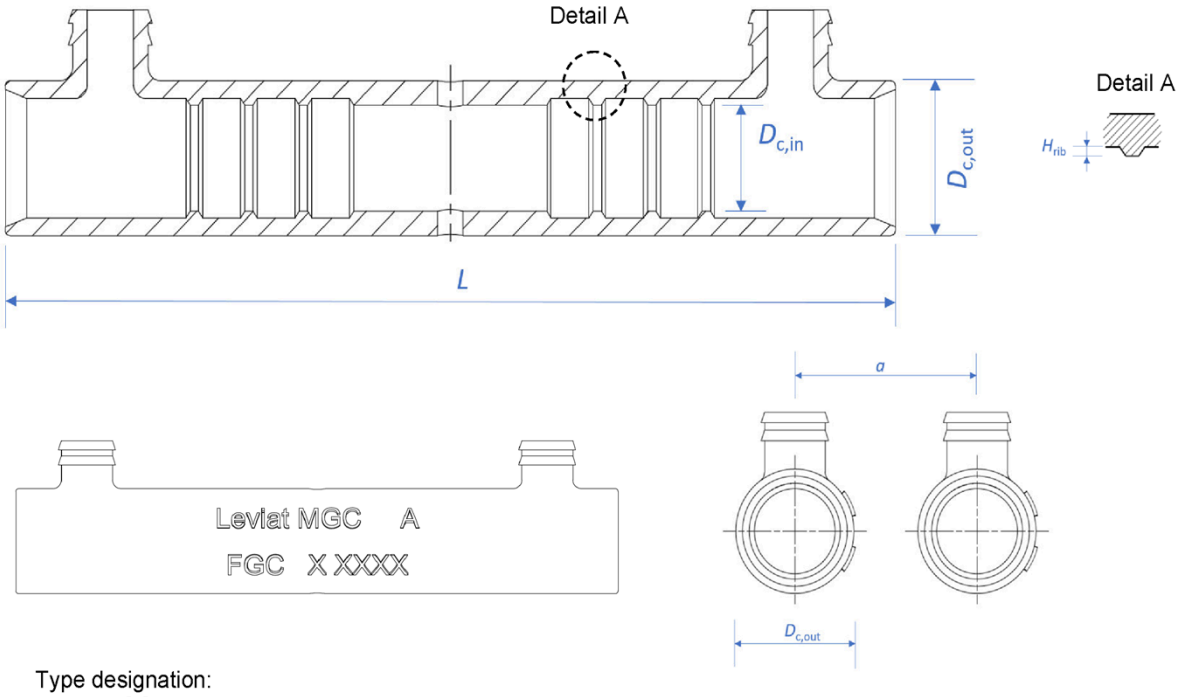
Leviat mechanical splicing system Grout Coupler

Product description
Half Grout Coupler

Annex A5

Deutsches Institut für Bautechnik DIBt

Full-Grout Coupler



Type designation:
Leviat MGC A (Brand) (size)
FGC X XXXX (Type) (manufacturer) (batch number)

Lap in one plane

Table A7: Dimensions of Full Grout Coupler (material acc. annex A2, all dimensions in [mm])

size	L	$D_{c,out}$	$D_{c,in}$	H_{rib}	$a^{1)}$
A	200	35	24	1,5	55
B	265	40	26	1,5	60
C	330	46	30	2	66
D	410	55	35	2	75
E	522	71	45	3	91
F	650	86	54	3	106

1) The spacing required for installation shall be observed

Leviat mechanical splicing system Grout Coupler	
Product description Full Grout Coupler	Annex A6

Deutsches Institut für Bautechnik DIBt

B.1 Intended use

Grout Couplers are used for mechanical splices according to EN 1992-1-1 and EN 1998-1 and annex C for:

- transfer of axial tension and/or compression forces of the connected bars according to EN 1992-1-1, clause 8.7 and 8.8(4)
- limitation of slip according to EN 1992-1-1, clause 7.3
- restistance to fatigue loading according to EN 1998-1, clause 5.6.3 (2)
- resistance to low-cycle seismic loading according to EN 1998-1, clause 5.6.3 (2)

Leviat mechanical splicing system Grout Coupler	
Intended use Specifications	Annex B1

B.2 Installation Requirements

- **General:** EN 1992-1-1 shall apply to planning and design. Mechanical splices with Grout Couplers may be loaded up to 100% in the same way as a non-spliced bar under static and quasi static tensile and compressive load, EN 1992-1-1, 8.7.2 (4) applies.
- **Spacing and edge distances**: The same values for non-spliced bars shall apply to the concrete cover over the outer edge of a coupler and to the clear distances between the outer edges of adjacent couplers in accordance with EN 1992-1-1. The spacing necessary for installation shall remain unaffected.
- **Bent bars**: For bent (pre-bent) bars, the intentional bending shall not begin until a distance of at least 5∅ from the coupler end (∅ = nominal diameter of the bent bar). If coupling bars are bent at the manufacturing plant with special equipment, the distance to the coupler end may be reduced to 2∅.
- **Installation**: The couplers shall only be installed by trained staff under the supervision of the responsible site manager. The installation shall follow the manufacturer‘s written instructions, see assembly instructions, annexes B3 to B4
- Couplers shall be used as supplied by the manufacturer, without changing or replacing individual parts.
- The threads and the coupler interiors shall be clean and free from rust. Suitable measures (such as plastic caps) shall be taken to ensure that laitance or other contamination cannot enter the coupler. Foreign materials present in the coupler shall be removed before the connecting bar is screwed in. All threads shall be protected against penetration of concrete, water and oil.
- An appropriate fixing of the coupler and continuing bars to the formwork should prevent shifting of the couplers while laying of the reinforcement or pouring and compacting of the concrete.
- In case of assembly of connecting bars HBS-05-A with Half Grout Couplers on construction site, the bar shall be screwed in manually up to its tapered thread until hand-tight. The remaining screwing-in process requires suitable tools (e.g. special tongs) and is complete when the last thread turn is no longer visible.
- **Processing and monitoring of grout on site**:
  - Grout must fulfil requirements according to table A3. Coumpliance must be checked using the grout manufacturer’s data sheets and declaration of performance.
  - Processing & mixing of grout shall take into account EN 206, chapters 9.6-9.8.
  - The grout manufacturer’s instructions shall be observed for processing & mixing. The addition of water according to the manufacturer's instructions must be observed. Residual water must not be used.
  - The mortar must be mixed in pure batches (complete sacks/containers/silo mixes provided it can be proven that no segregation has occurred in the silo and that measuring agents are present). Dry mixes may only be used within the specified shelf life; mixes that have already partially hardened in the bag/container/silo may not be used.
  - The quality control according to Table B.1 must be documented in an appropriate manner.
  - The consistency of the grout may be determined using the flow rate (reference value) or the spread rate. When assessing the consistency with the spreading dimension, the correlation between the flow and spreading dimension must be determined in advance.

Leviat mechanical splicing system Grout Coupler	Annex B2
Intended use Specifications, installation requirements	

B.3 Installation requirements – control of grout quality on construction site

Table B.1: Control of grout properties on construction site

subject	Test	requirements	frequency
Delivery note / container imprint / accompanying label	visual inspection	Conformity with the specifications; Use within the permitted storage period	every delivery
Measuring device for water addition	function control	flawless operation	per production day
Measuring device for dry mix (for portioning from silo)		Compliance with target dimensions, accuracy 3%	Monthly
Mixing tool	function control	flawless operation	per production day
Mixing	visual control	Homogeneity of the mixture; cohesive grout (no segregation)	Each mixture or ongoing
	visual control	Consistency; adherence to the specified consistency range	Each mixture or ongoing
Consistency	Flow dimension EN 13395-2 / Spreading dimension EN 12350-5	Consistency measure; Compliance with the specified consistency range	during the initial production and at appropriate intervals during the production of the test specimens for the compressive strength test
Compressive strength	prism strength EN 196-1 / cube strength EN 206	Compliance with the required compressive strength	at first production and at appropriate intervals , each 1 set of prisms or 3 cubes (150 mm)

Deutsches Institut für Bautechnik DIBt

B.4 Installation requirements: assembly instructions, part 1

Preparation of couplers:
Check cleanliness: make sure that the inside of the sleeve is free of foreign objects / dirt,
Use a torch light or similar if necessary. If necessary, blow out dirt with compressed air.
Optional for FGC: Attach end cap to centre the loose reinforcing steel

Connection coupler -rebar in the first conreting section:
FGC: insert loose rebar until it stops at centre pin
HGC: in case of site assembly: screw in connecting bar until the last thread turn is invisible.
Factory assembled coupler bars can be processed further directly.

Preparation of formwork:
Measure the position of the bar axes on the formwork.
Drill hole, see table for diameter.
Push the positioning plug through, loosely tighten the wing nut.

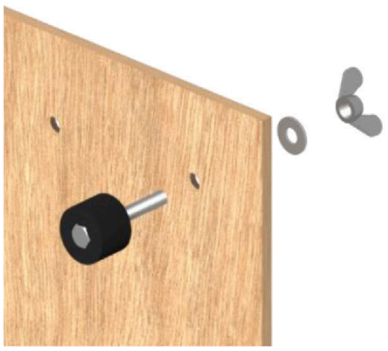


Table B.2: Drill holes for position plug

coupler size	drill hole for thread
A, B	M10
C, D	M12
E, F	M16

Positioning of coupler on formwork:
Place the coupler on the positioning aid.
Turn the coupler so that the vents are in the correct position for subsequent grouting.
The edge of the coupler must be in contact with the formwork.
Tighten the wing nut of the positioning plug.

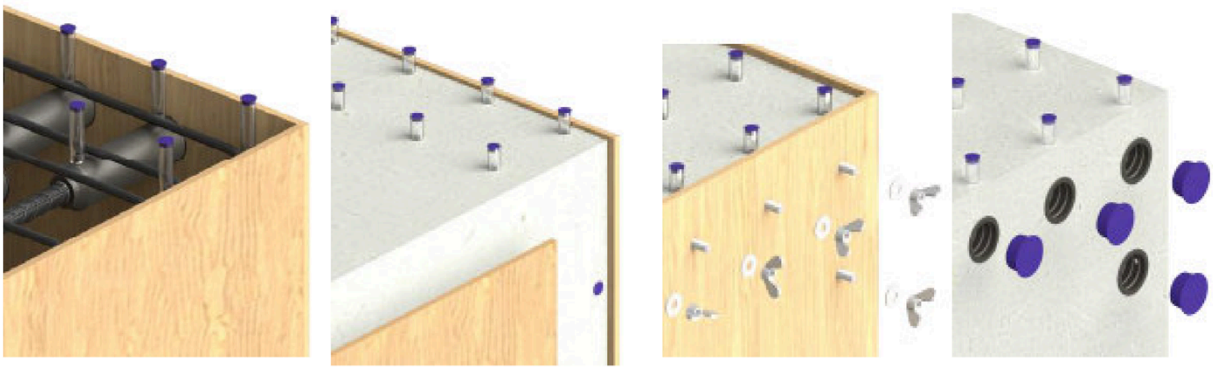
Attach filling hose
Attach a sufficiently long filling hose to the filler necks (length at least up to the concrete surface).
Temporarily seal the end of the hose (e.g. with end caps) to prevent the ingress of dirt

Leviat mechanical splicing system Grout Coupler	Annex B4
Intended use Installation requirements: assembly instructions	

Deutsches Institut für Bautechnik DIBt

B.5 Installation requirements: assembly instructions, part 2

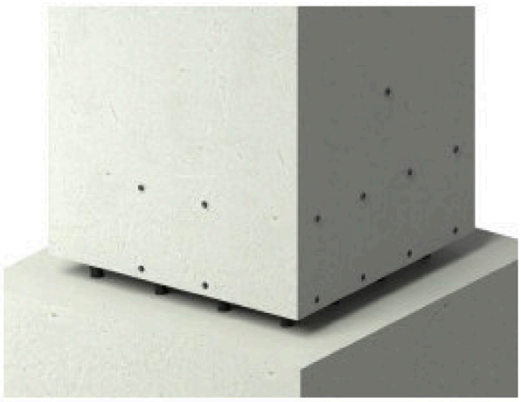
Formwork, reinforcement, concreting:
After the concrete has hardened, remove the wing nuts and demould.
Remove the positioning plugs (reusable).
Place dirt caps on the open end of the coupler to prevent dirt from entering.



Connection with adjacent component:
Remove the dirt caps and end caps.
Insert the loose bar of the next construction section / attach the precast element with grout couplers onto the reinforcing bars of the previous concreting section / precast element.
Align. Secure position.

Cleanliness check: areas to be grouted should be be free of oil, dirt etc.

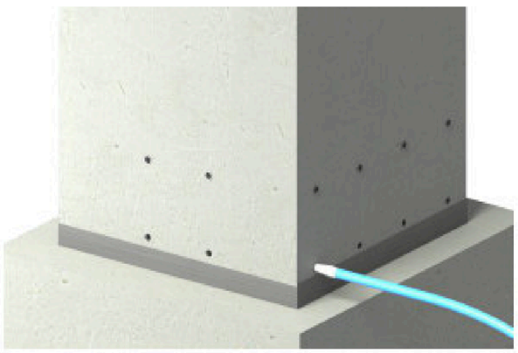
Mixing and testing the grout according to grout manufacturers data sheet.



Grouting: Connect the filling device to the lower filling hose (hand pump is sufficient).

Pour in the grout until overflow from the upper opening.
Close the upper and lower openings (e.g. with end caps).

Hardening / Curing
After curing, cut off any protruding hose ends above concrete surface.



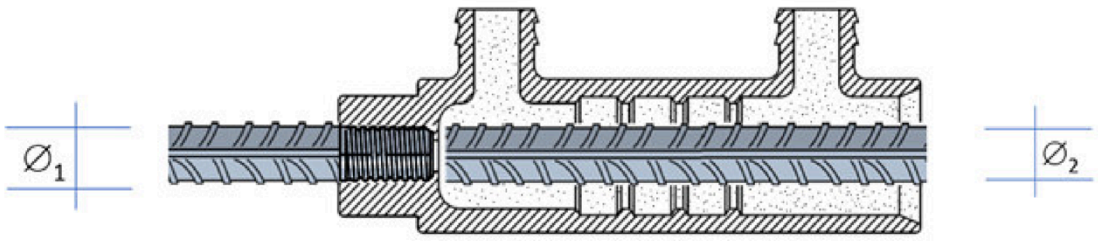
Leviat mechanical splicing system Grout Coupler	Annex B5
Intended use Installation requirements: assembly instructions	

C.1 Essential characteristics Half-Grout-Coupler-connections

Table C1: Essential characteristics of connections with Half Grout Couplers according to Annex A5

		∅ [8]		[mm]	12	14	16	18	20	22	25	26	28	30	32
Resistance to static or quasi static loading	failure of rebar	$f_{u,min,\ outside}$ [1]		[N/mm²]	540 / 575										
	Failure inside splice length	$f_{u,min,\ inside}$ [2]		[N/mm²]	540 / 575										
		$f_{u,min,\ coupler}$ [3]		[N/mm²]	650										
		min $A_{gt,act}$		[%]	3,0										
slip	under static or quasi-static load	max s_1 [4]		[mm]	0,12	0,14		0,16		0,24				0,27	
	after static or quasi-static loading	max s_2 [5]		[mm]	0,1										
Fatigue strength	characteristic fatigue strength for $N = 2 \cdot 10^6$ load cycles	$\Delta\sigma_{Rsk}$	$N = 2 \cdot 10^6$	[N/mm²]	60										
Resistance to low-cycle loading (seismic actions)	Residual deformation	max u_{20}		[mm]	0,2										
	Ultimate load	min $F_{u,B500B}$ [6]		[kN]	61,1	83,1	108,6	137,4	169,6	205,3	265,1	286,7	332,5	381,7	434,3
		min $F_{u,B500C}$ [7]		[kN]	65,0	88,5	115,6	146,3	180,6	218,6	282,3	305,3	354,1	406,4	462,4

1) $f_{u,min,\ outside} = 1{,}08 \cdot R_{e,nom}$ for B500B / $1{,}15 \cdot R_{e,nom}$ for B500C (in case of failure outside splice length)
2) $f_{u,min,\ inside} = 1{,}08 \cdot R_{e,nom}$ for B500B / $1{,}15 \cdot R_{e,nom}$ for B500C (in case of failure inside splice length)
3) $f_{u,min,\ coupler} = 1{,}3 \cdot R_{e,nom}$ (in case of coupler failure)
4) slip under load $0{,}6 \cdot R_{e,nom}$
5) slip after unloading from $0{,}6 \cdot R_{e,nom}$ to $0{,}02\ R_{e,nom}$
6) $F_{u,B500B} = 1{,}08 \cdot A_{s,nom,bar} \cdot R_{e,nom,bar}$
7) $F_{u,B500C} = 1{,}15 \cdot A_{s,nom,bar} \cdot R_{e,nom,bar}$
8) In connections with $\varnothing_1 \neq \varnothing_2$ the performance of the smaller diameter applies $\varnothing = \min(\varnothing_1, \varnothing_2)$



Leviat mechanical splicing system Grout Coupler

Performance
Essential characteristics: Half-Grout-Coupler connections

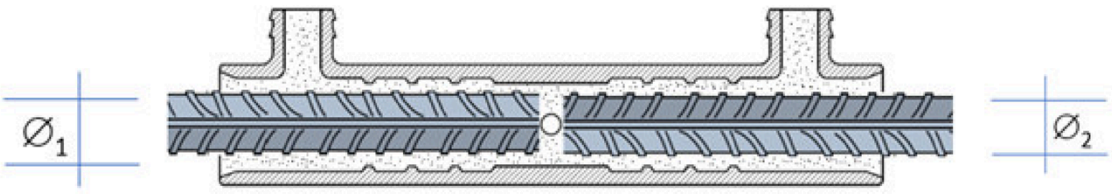
Annex C1

C.2 Essential characteristics Full-Grout-Coupler-connections

Table C2: Essential characteristics of connections with Full Grout Couplers according to Annex A6

		∅ [8]		[mm]	12	14	16	18	20	22	25	26	28	30	32
Resistance to static or quasi static loading	failure of rebar	$f_{u,min,\ outside}$ [1]		[N/mm²]	540 / 575										
	Failure inside splice length	$f_{u,min,\ inside}$ [2]		[N/mm²]	540 / 575										
		$f_{u,min,\ coupler}$ [3]		[N/mm²]	650										
		min $A_{gt,act}$		[%]	3,0										
slip	Under static or quasi-static load	max s_1 [4]		[mm]	0,12	0,14		0,16		0,24				0,28	
	after static or quasi-static loading	max s_2 [5]		[mm]	0,1										
Fatigue strength	characteristic fatigue strength for $N = 2 \cdot 10^6$ load cycles	$\Delta\sigma_{Rsk}$	$N = 2 \cdot 10^6$	[N/mm²]	60										
Resistance to low-cycle loading (seismic actions)	Residual deformation	max u_{20}		[mm]	--	--	--	--	0,2						
	Ultimate load	min $F_{u,B500B}$ [6]		[kN]	--	--	--	--	169,6	205,3	265,1	286,7	332,5	381,7	434,3
		min $F_{u,B500C}$ [7]		[kN]	--	--	--	--	180,6	218,6	282,3	305,3	354,1	406,4	462,4

1) $f_{u,min,\ outside} = 1{,}08 \cdot R_{e,nom}$ for B500B / $1{,}15 \cdot R_{e,nom}$ for B500C (in case of failure outside splice length)
2) $f_{u,min,\ inside} = 1{,}08 \cdot R_{e,nom}$ for B500B / $1{,}15 \cdot R_{e,nom}$ for B500C (in case of failure inside splice length)
3) $f_{u,min,\ coupler} = 1{,}3 \cdot R_{e,nom}$ (in case of coupler failure)
4) slip under load $0{,}6 \cdot R_{e,nom}$
5) slip after unloading from $0{,}6 \cdot R_{e,nom}$ to $0{,}02\ R_{e,nom}$
6) $F_{u,B500B} = 1{,}08 \cdot A_{s,nom,bar} \cdot R_{e,nom,bar}$
7) $F_{u,B500C} = 1{,}15 \cdot A_{s,nom,bar} \cdot R_{e,nom,bar}$
8) In connections with $\varnothing_1 \neq \varnothing_2$ the performance of the smaller diameter applies $\varnothing = \min(\varnothing_1, \varnothing_2)$



Leviat mechanical splicing system Grout Coupler

Performance
Essential characteristics: Full-Grout-Coupler connections

Annex C2