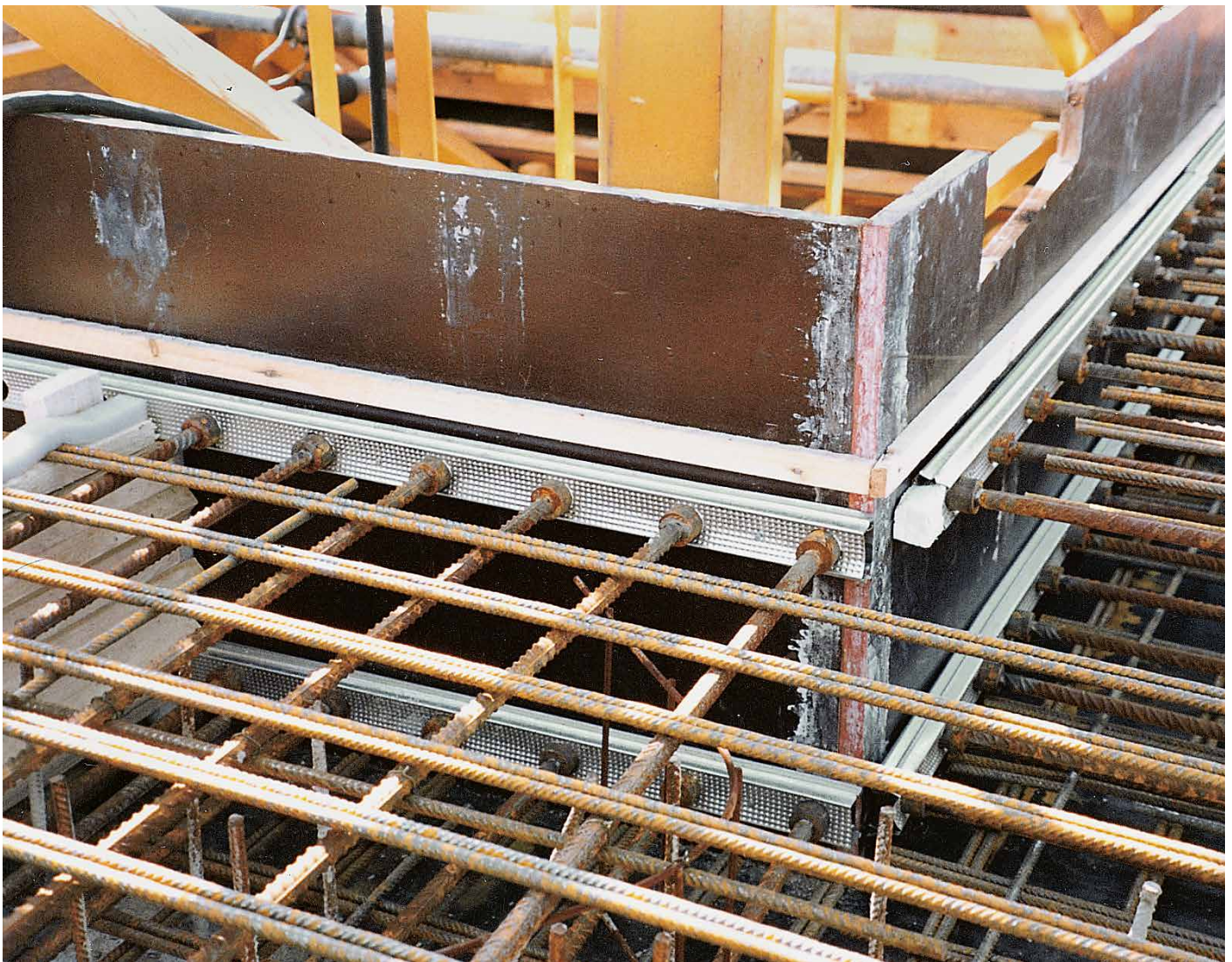


Structural Connections
Reinforcing bar couplers

Leviat[®]
A CRH COMPANY

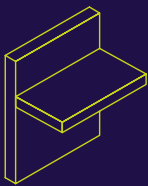
Plaka Couplerbox

Jointing system with couplers



Imagine. Model. Make.

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.

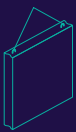


Structural Connections

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.

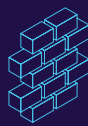
- Insulated balcony connectors
- Reinforcing bar couplers
- Concrete Connections
- Reinforcement continuity systems
- Punching shear reinforcement
- Shear load connectors
- Floor Joint Systems
- Precast / Reinforced Columns
- Infrastructure Products
- Precast Connections
- Acoustic dowels and bearings
- Prestress

Other areas of expertise:



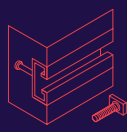
Lifting & Bracing

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.



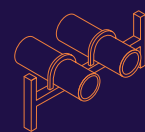
Anchoring & Fixing

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



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.

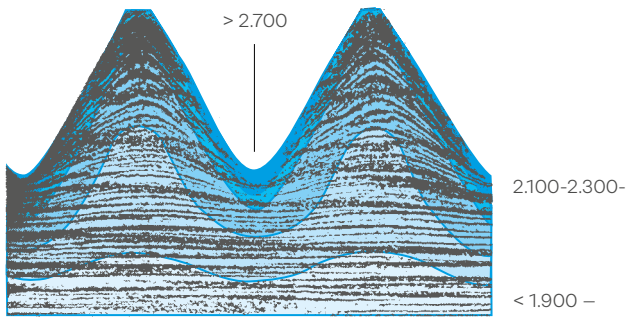
Leviat product ranges:

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

Plaka Couplerbox

Jointing system for concrete elements

Due to our special parallel rolled thread, the Couplerbox jointing system combines safety with excellent technical performance. The couplers help the connection to provide good resistance to static and dynamic loads.

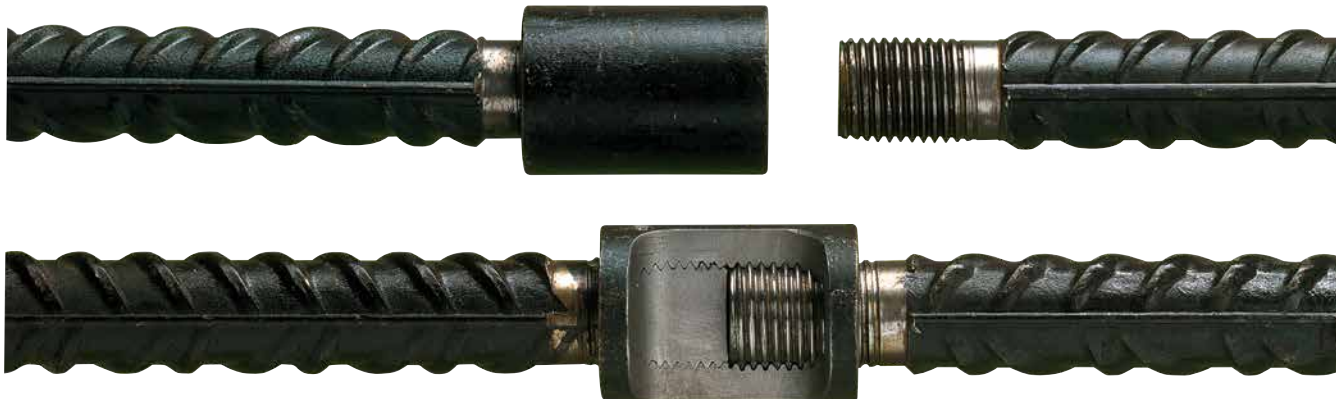


Vickers hardness N/mm²

Parallel rolled thread

The advantage of the parallel thread over tapered thread is that resistance is maintained even when screwed 2 or 3 turns too short. This can occur when debris (dirt/concrete) enters the coupler before the second phase bar is installed.

Unlike thread cutting, thread rolling does not scratch the steel and therefore causes no crack initiation (fatigue). By bending the fibres without cutting them, the material is pushed back into the mass so that the section, as well as the resistance and the hardness is increased.



Advantages

- Complies with the criteria determined in the various European standards and has approval (Zulassung) in Germany
- The coupling may be treated as a continuous bar
- Lengthening the joint (Agt) by the maximum load amounts to minimum 4%
- After 3 consecutive load cycles at 60% of the yield strength and then back to the rest position, the permanent lengthening of the connection is $\leq 0,1$ mm
- Provides very good resistance to dynamic loads

Due to its excellent properties, this system has been used on various High Speed Train sites in Europe

Plaka Couplerbox

Various types

CA type

Straight bar for the first phase supplied with a coupler at one end. The coupler is manually screwed on and glued to ensure that it does not become unscrewed during transport and handling.



CR type

Straight bar for the second phase supplied with a thread at one end.



CAC type

Straight bar for the first phase, bent at an angle of 90° or according to specifications. The diameters of the mandrels (dBr) as well as the minimum length L_1 , limited by the diameter of the bars, are shown in the table below.

$L = L_0 + L_1$

Ø bar (mm)	12	14	16	20	25	32	40
dBr (mm)*	100	100	100	150	200	250	300
L1 (mm)*	140	150	180	210	260	300	410



* Important information in relation to the CAC bars: the CAC couplers are, as standard, bent over a mandrel with a diameter as stated above. This results in a min. length L_1 . The diameter of the mandrel corresponds to 10 x the diameter of the bar. If the customer orders dimension L_1 smaller than the above, it will no longer correspond to 10 x the diameter. Any change in properties will be fully the responsibility of the customer.

CAM type

The straight CAM bar has a coupler on both ends.



CAF type

The straight CAF bar has a coupler on one end and a thread on the other.



Plaka Couplerbox

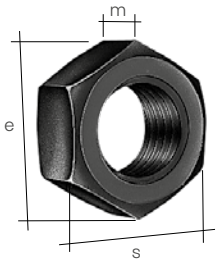
Various types



Ø bar (mm)	12	14	16	20	25	28	32	40
D (mm)	22	22	32	32	40	45	50	60
E (mm)	43	47	47	55	64	69	80	110
Thread	M13 x 1,75	M15 x 2	M17 x 2	M21 x 2,5	M26 x 3	M29 x 3	M33 x 3,5	M41 x 4
Weight of coupler (kg)	0,09	0,09	0,22	0,22	0,39	0,53	0,73	1,46
Tightening torque (Nm)*	60	100	100	200	250	280	280	340
Modified wrench length (cm)**	20	30	30	60	80	80	80	100

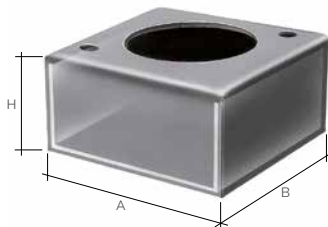
* The tightening torque is only applicable on the second phase bar.

** Small tightening torques are reached with 35 kg force using a modified wrench. More safety is possible using a torque wrench.



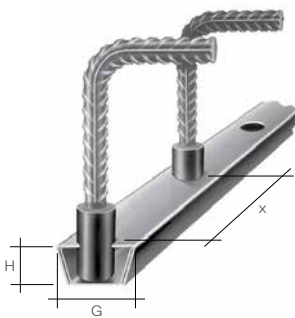
Couplerbox screw nut

Metric thread	s (mm)	e (mm)	m (mm)
M13	19	22	11
M15	22	25	12
M17	24	28	13
M21	30	34	16
M26	36	41	19
M29	41	47	22
M33	50	57	25
M41	59	68	32



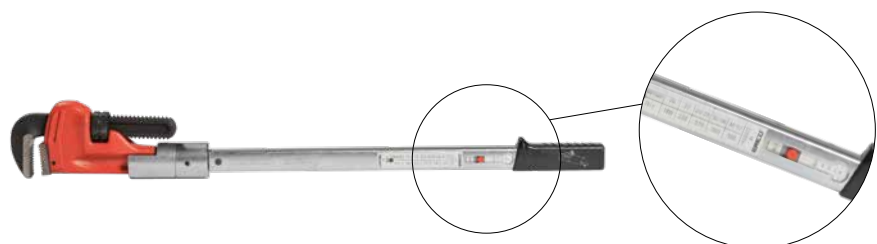
Monobox

Ø bar (mm)	12	14	16	20	25	28	32	40
A x B (mm x mm)	70x70	70x70	70x70	70x70	70x70	70x0	70x70	70x70
H (mm)	25	25	25	25	25	25	25	25
Weight (kg)	0,08	0,08	0,08	0,08	0,08	0,07	0,07	0,07
Weight of cover (kg)	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02



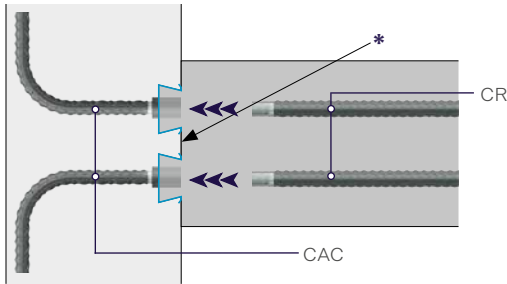
Multibox (length 1,20 m ; x = 100, 150, 200 mm)

Ø bar (mm)	12	14	16	20	25	28	32	40
G (mm)	60	60	60	60	60	60	60	90
H (mm)	28	28	28	28	28	28	28	28
Weight (kg/m)	0,93	0,93	0,93	0,93	0,93	0,93	0,93	1,05
Weight of slide (kg/m)	0,34	0,34	0,34	0,34	0,34	0,34	0,34	0,40

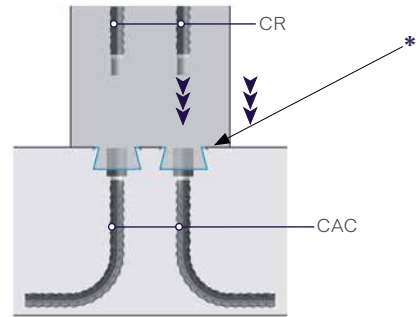


Plaka Couplerbox

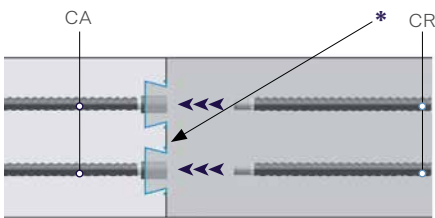
Applications



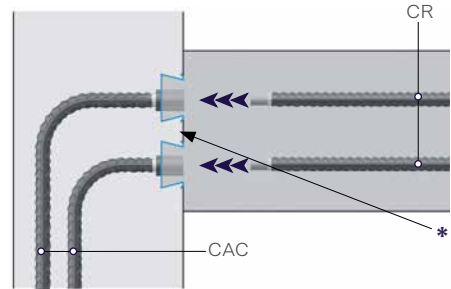
Wall to wall connection
Climbing or sliding formwork



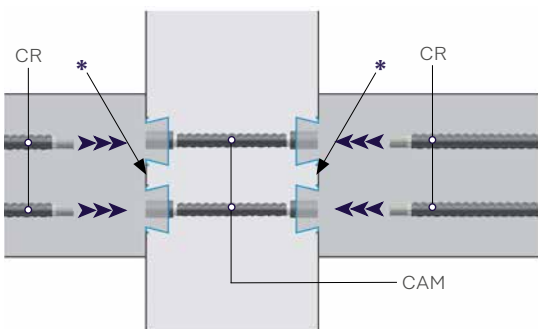
Floor to wall connection
Columns or walls on floor



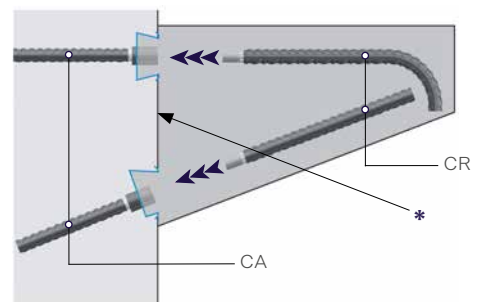
Floor to floor connection



Wall to floor connection
Also for cast walls



Floor to wall to floor connection
Anchoring with 2 couplers
Beam to column to beam connection



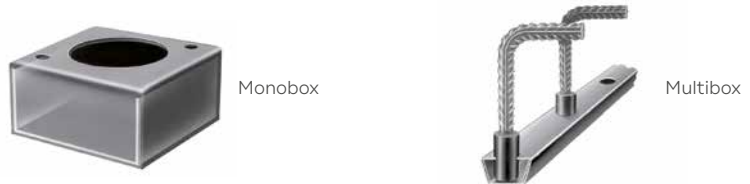
Wall to cantilever connection
Special covers give the Couplers an incline

* Ask us for advice about our waterproofing systems

Plaka Couplerbox

Monobox and Multibox

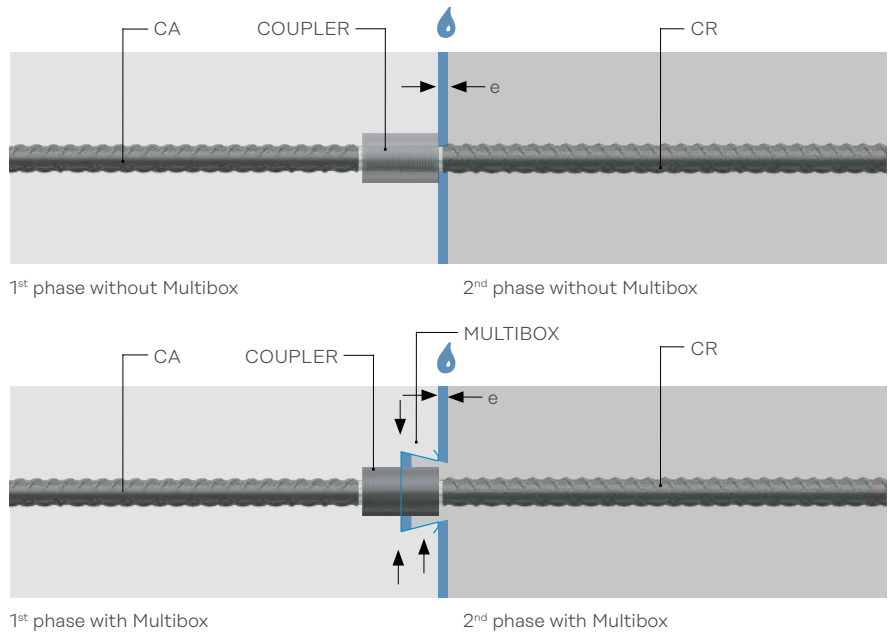
The use of the Monobox or Multibox boxes simplifies positioning, reduces installation time and improves the quality of the connecting joint.



Tongue and groove connection of the Multibox.

The sides of the box are blocked by shrinkage.

The joint profile consists of a tongue and groove connection.



Advantages

■ Protecting the thread against corrosion

The concrete shrinkage 'e' causes the joint to open slightly so that condensation and seeping water could penetrate the thread on the coupler: the most stressed and weak zone on the coupling. Thanks to the Monobox or Multibox the thread is placed in a homogeneous phase of the concrete, protected from corrosion.

■ The coupler can easily be found

Once the coupler is covered by concrete it is difficult to find and to release. The use of the Monobox or Multibox solves this problem because the coupler is not fixed to the formwork: it can move freely over a distance of 25 mm in the box. The box is fixed to the formwork and can be easily found when the formwork is removed. Using the Multibox is especially efficient for cast walls and slurry walls.

■ Excellent fixing of the coupler

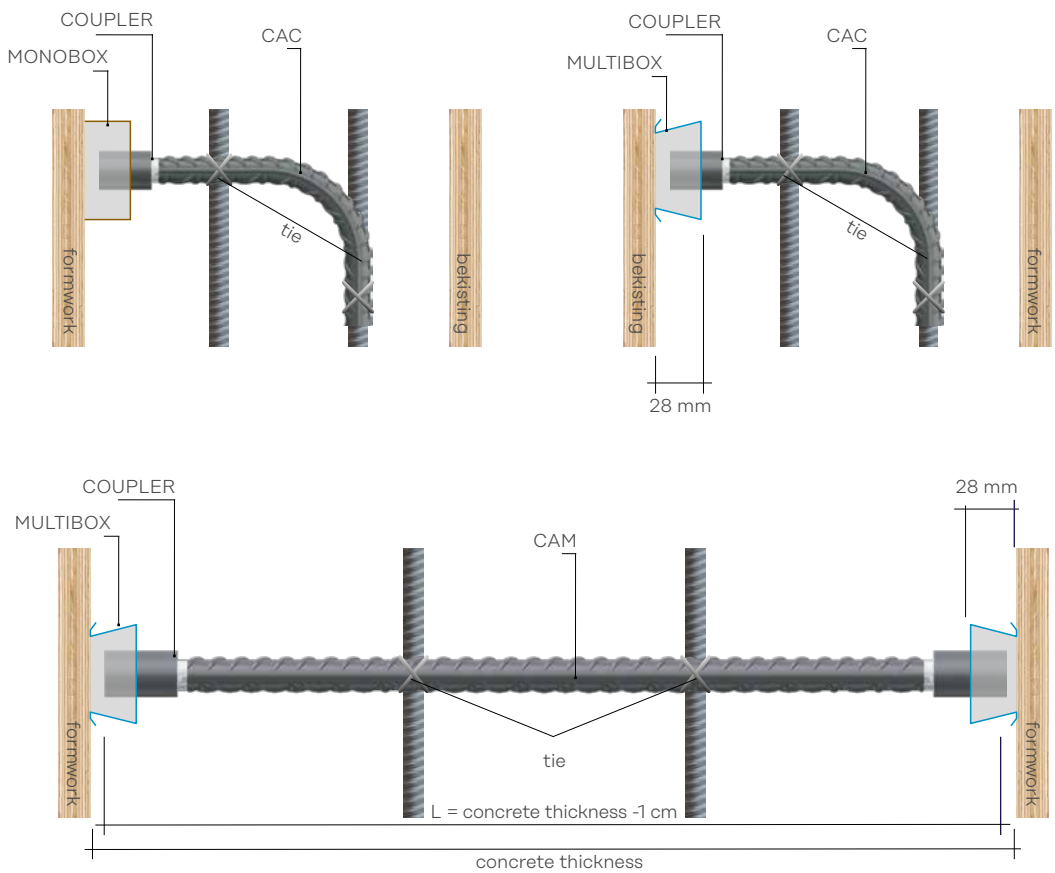
The coupler is supported by the Monobox or Multibox which guide the coupler while maintaining its position and orientation.

■ Increases the implementation tolerances

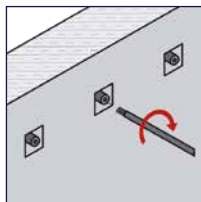
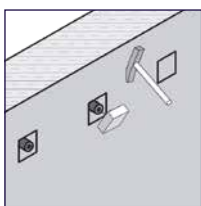
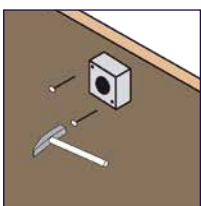
The presence of the Monobox or Multibox enables greater installation tolerances.

Plaka Couplerbox

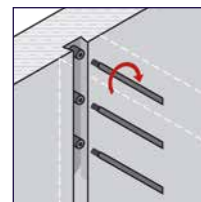
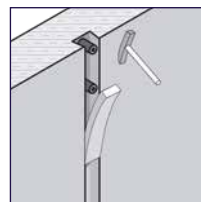
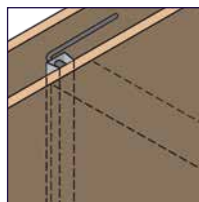
Applications



Instructions for use



- Position and nail the Monobox or Multibox against the formwork
- Put the first phase CA, CAC or CAM type bar with a coupler and protective lid in the Box and tie the bar to the reinforcing
- Pour the concrete in the first phase
- When the formwork has been removed, remove the cover from the Monobox or Multibox and the protective lid from the coupler
- Screw the second phase type CR bar to the coupler
- Apply the correct tightening torque depending on the diameter of the bar



Plaka Couplerbox

Quality of Couplerbox jointing system

The Couplerbox jointing system complies with the criteria specified in various European standards. The system has approval (Zulassung) in Germany.

■ Resistance criteria

The fracture occurs at minimum 95% of the actual resistance of the weakest bar in the joint. The coupling may be treated as a continuous bar.

■ Lengthening criteria

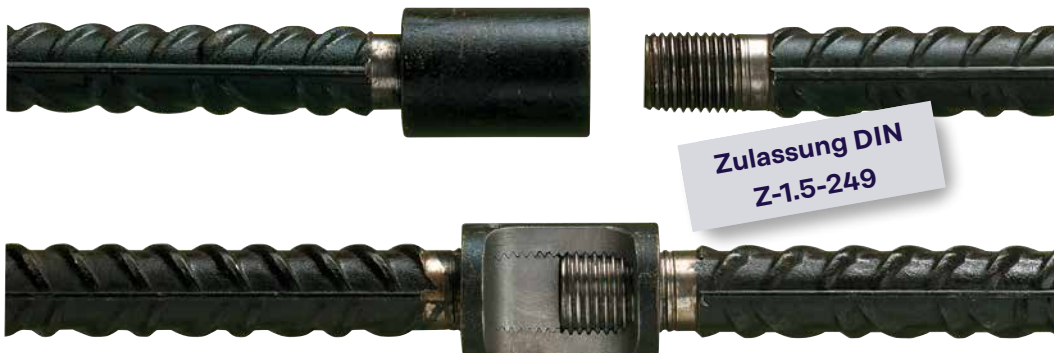
Lengthening the joint (Agt) under maximum load is minimum 4%.

■ Sliding criteria

After 3 simultaneous load cycles at 60% of the yield strength and then back to the rest position, the permanent lengthening is ≤ 0.1 mm.

■ Fatigue criteria

Dynamic loads cause fatigue problems (cracks, fractures). Thanks to its parallel rolled thread, the Couplerbox provides particularly good resistance in this kind of situation.



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