

Our mix for your wall connections: PFEIFER-FS-Box



09/2017

PFEIFER FS-System

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PFEIFER – helping you make the right connections.

430-year link with rope.

PFEIFER Seil- und Hebetechnik GmbH in Memmingen is the headquarters of the PFEIFER Group and can look back on a family tradition of more than 430 years in the manufacture of ropes and cables. All our activities can be traced back to lifting, attaching and securing with cables.

Today, Gerhard Pfeifer, of the 12th generation of the family, heads the international group of companies providing top-class performance in the areas of wire rope technology, lifting technology and connecting and lifting systems.



Quality is our business.

All our products have always been safety-related. In every case, human lives depend on our products working safely. Quality and extensive application knowledge are therefore the basis for all advice and developments. We want to gain, and retain, the trust of our customers through reliable and innovative products and a reliable service. Which is exactly why both today and in the future we are backing “Made in Germany” where it matters.

We will be pleased to give you advice. Good advice.

With constant ongoing development, regular testing and inspection of our products, our engineers and technicians are a team of advisors with a comprehensive body of knowledge and innovative strength.

To be able to pass on this application knowledge to customers, we have trained a network of consulting engineers with this expert knowledge. Our technology experts can develop reliable, economical and safe suggestions for components and solutions – even for the most difficult applications, e.g. anchors even in limit situations that differ from the general installation manuals.

As easy as pie: The PFEIFER-FS-Box for your double wall connection.



+ Problem solving

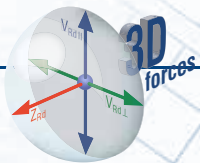
- Unique solution for the joining of double walls to precast elements
- No subversive elements in the assembly

+ Flexible

- Loop cannot not distort – loop rebounds immediately back into the required position
- Any configuration can be achieved
- No need to cut long metal profiles to length any more

+ Loadable

- Design resistances can be achieved in all directions



+ Efficient

- Practice-orientated carrying capacity
- Timesaving – easy to install
- High carrying capacities

+ Robust

- Robust wire rope loops – perfectly designed for use with in-situ concrete
- Sturdy metal box

+ Qualitative

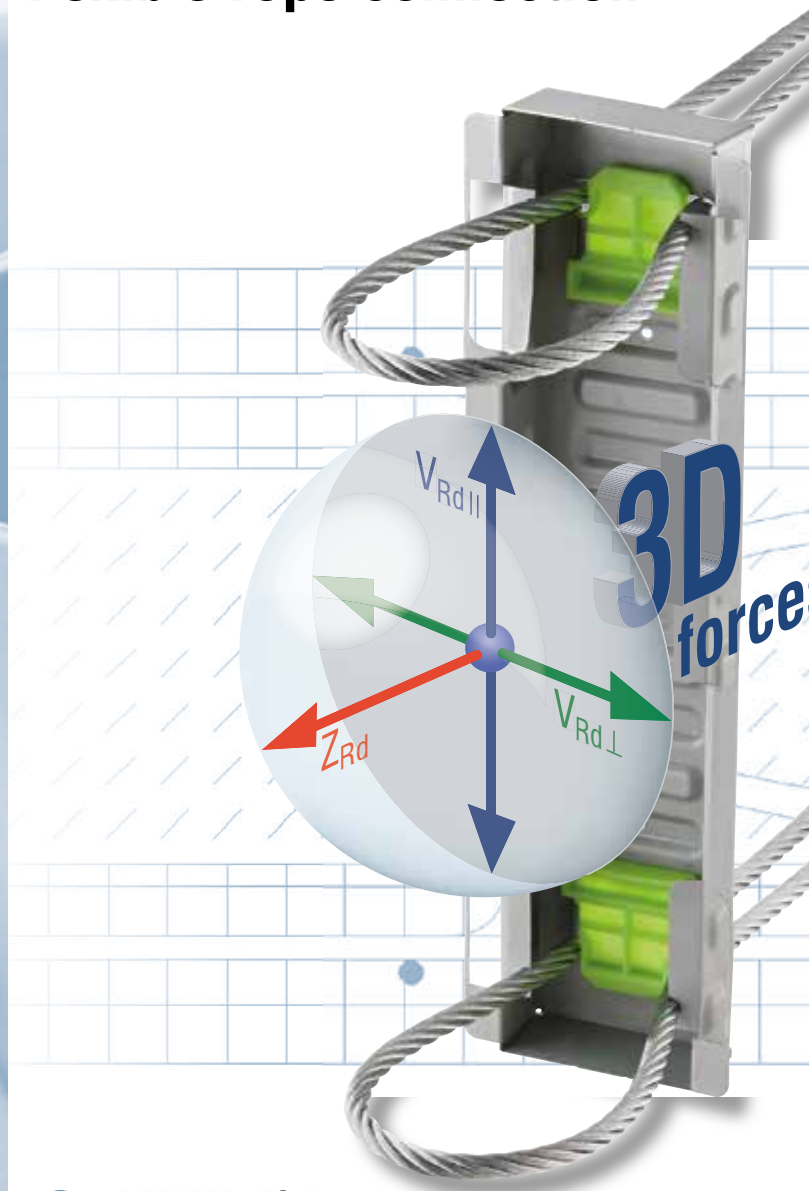
- German building authority approval
- Construction site-compatible design

+ Innovative

- Flexible use for double wall connections
- Enables in-situ concrete connections



Our latest, complete mix for easy in-situ concrete connections: The PFEIFER-FS-Box flexible rope connection.

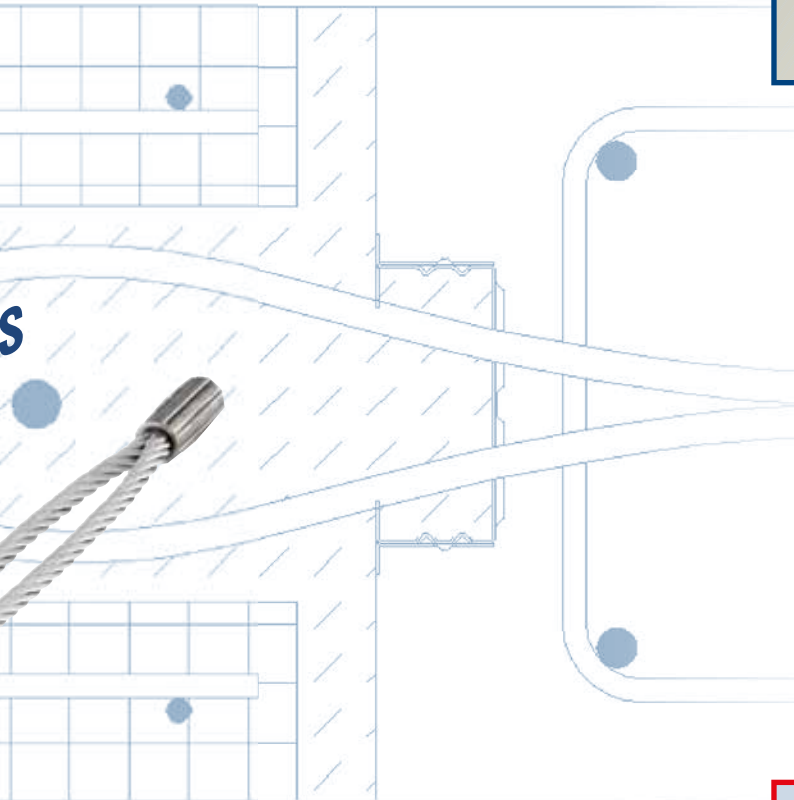
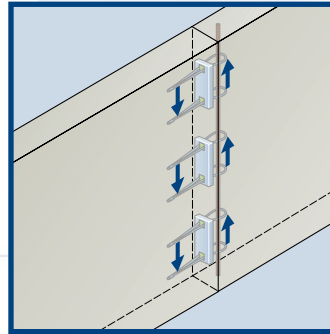


PFEIFER-FS-Box

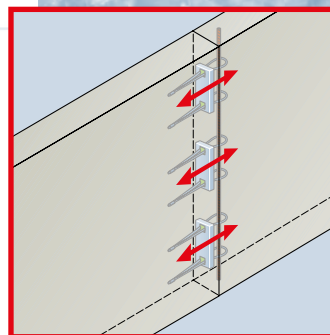
- Flexible rope connector for double wall connections and in-situ concrete
- Thick and robust wire rope loops, specially for in-situ concrete anchors
- Maximum flexibility and speed
- Can be used in various concrete structural elements and for connecting:
 - **Precast elements and semi-precast elements**
 - **Precast elements and in-situ concrete**
 - **Semi-precast elements and semi-precast elements**
 - **Semi-precast elements and in-situ concrete**
 - **In-situ concrete and Semi-precast elements**
 - **In-situ concrete and in-situ concrete**



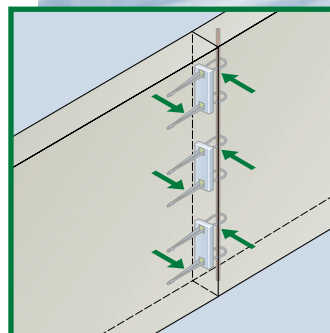
- Shear force $V_{Rd,II}$ parallel, building authority regulated
- High transfer of transversal shear forces thanks to interlock
- Robust shear force model with two loops



- Planned-load pull stress Z_{Rd} is possible
- Can be used for wall thickness from 140 mm
- Flexible and user-defined spacing – precisely to requirement



- Shear force $V_{Rd,I}$ approved perpendicularly from a wall thickness of 140 mm
- Design resistances available for highly varied concrete strengths and wall thicknesses



PFEIFER-FS-Box

Item-No. 05.400.150



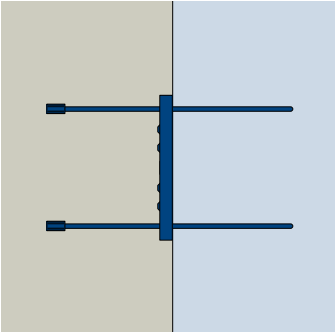
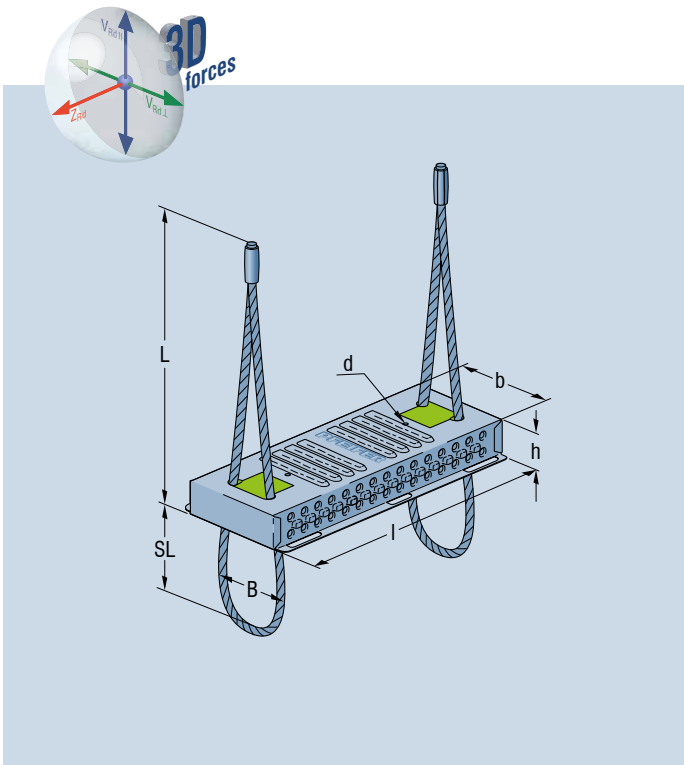
PFEIFER

Reinforcement Systems
FS-Box

The PFEIFER-FS-Box is designed for the connection of concrete structural elements. The wire rope loop grips into the in-situ concrete area to form a straightforward interlocking connection with the transverse bar installed on site, particularly between precast elements and double wall elements.

Advantages: Robust, construction site-compatible metal box, no direction-specific installation required, can be used for highly diverse concrete structural elements, flexible.

Materials:
Box: steel sheet, galvanized
Steel rope: high-strength, galvanized
Ferrule: special quality steel
Cover: tape

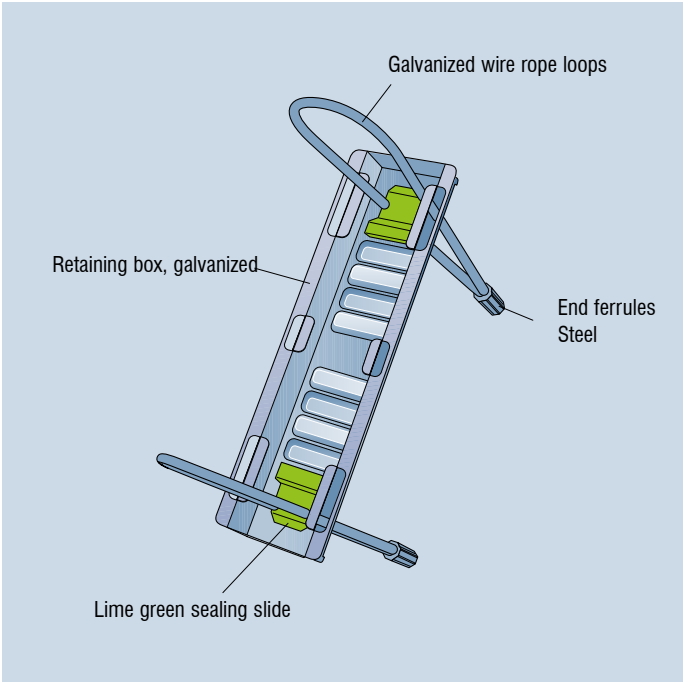


Ref.-No.	Type	Dimensions [mm]				L	SL	B	Colour clip	Weight approx. [kg/piece]
		b	l	h	d					
05.400.150	FS-Box	70	320	30	3	250	150	80	lime green	0,50



System

FOR PLANNERS · FOR PRECAST PLANTS · FOR USERS



The PFEIFER-FS system is designed for connecting precast elements and double walls. The extended loops engage into the double wall. In combination with a centrally inserted reinforcement bar and the subsequent concreting on the construction site it is a straightforward process to produce an load bearing connection. Alternatively other in-situ concrete connections can be realized.

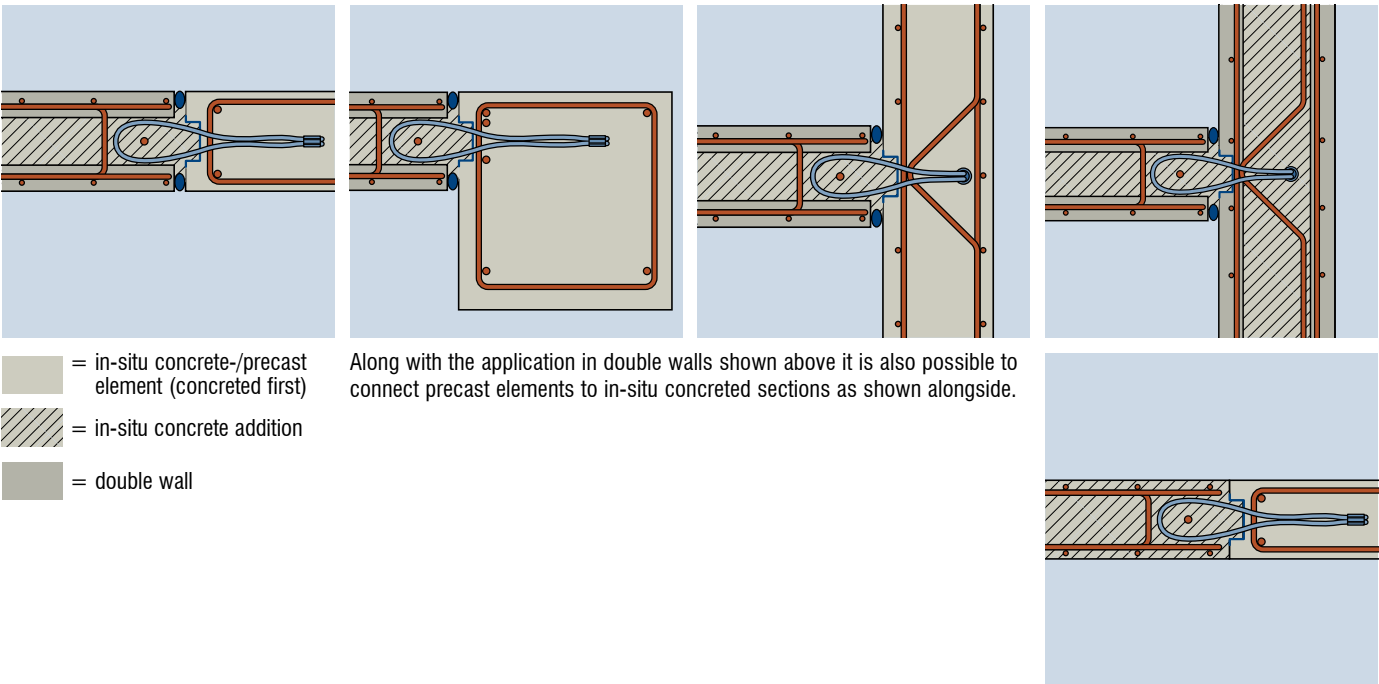
PFEIFER-FS-Box comprising the following individual components:

1. Retaining box, galvanized
2. Wire rope loops made of thicker and robust galvanized round strand ropes
3. End ferrules, steel
4. Neon green sealing slide

Delivered taped with fabric tape, wire rope loops retracted into retaining box.

Use

FOR PLANNERS · FOR PRECAST PLANTS · FOR USERS



Dimensioning

FOR PLANNERS · FOR PRECAST PLANTS · FOR USERS

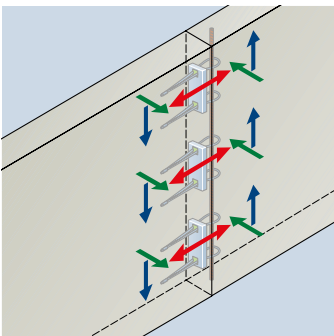


Table 1: Design resistances, PFEIFER-FS-Box

Wall thickness [mm]	Design resistances tensile force Z_{Rd} [kN/Box] all concrete qualities	Design resistances parallel transverse force $V_{Rd, }$ [kN/Box] all concrete qualities	Design resistances vertical transverse force $V_{Rd,\perp}$ [kN/Box]	
			C 25/30	C 30/37
140	35	45	9,00	10,00
160	35	45	12,70	14,10
180	35	45	16,40	18,20
200	35	45	16,63	18,47
220	35	45	16,87	18,73
240	35	45	17,10	19,00

Prerequisites:

- Minimum concrete quality C 25/30 in both structural elements
- Maximum aggregate size – 16 mm
- Consistency not less than F4 (acc. to NF EN 206-1:2001-07)
- For predominantly static loads



Notice: The approval text “PFEIFER-FS In-Situ Concrete Box, approval number Z-21.8-1981” is an inherent component of these instructions for installation and use and must be attached!

Proof of parallel shear forces

$$\frac{V_{Ed, II}}{V_{Rd, II}} \leq 1$$

$V_{Ed, VII}$ [kN/Box]: Shear force acting parallel to the joint
 $V_{Rd, II}$ [kN/Box]: Design value of shear force carrying capacity parallel to joint

Proof of perpendicular shear forces

$$\frac{V_{Ed, \perp}}{V_{Rd, \perp}} \leq 1$$

$V_{Ed, \perp}$ [kN/Box]: Shear force acting perpendicular to the joint
 $V_{Rd, \perp}$ [kN/Box]: Design value of shear force carrying capacity perpendicular to joint

Proof of tensile forces/interaction

$$Z_{Rd} \geq Z_{Ed, VII} + Z_{Ed, V\perp} + Z_{Ed, N}$$

wherein: $Z_{Ed, VII} = 0,78 \cdot V_{Ed, II}$

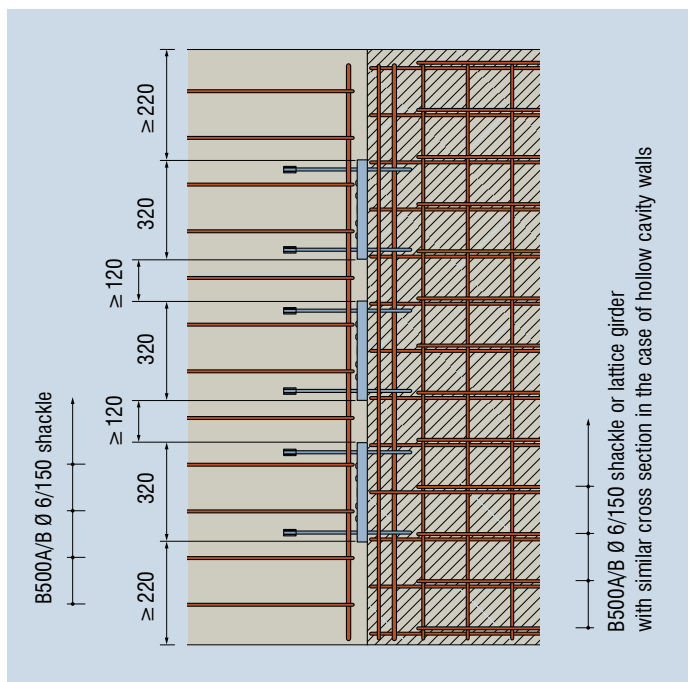
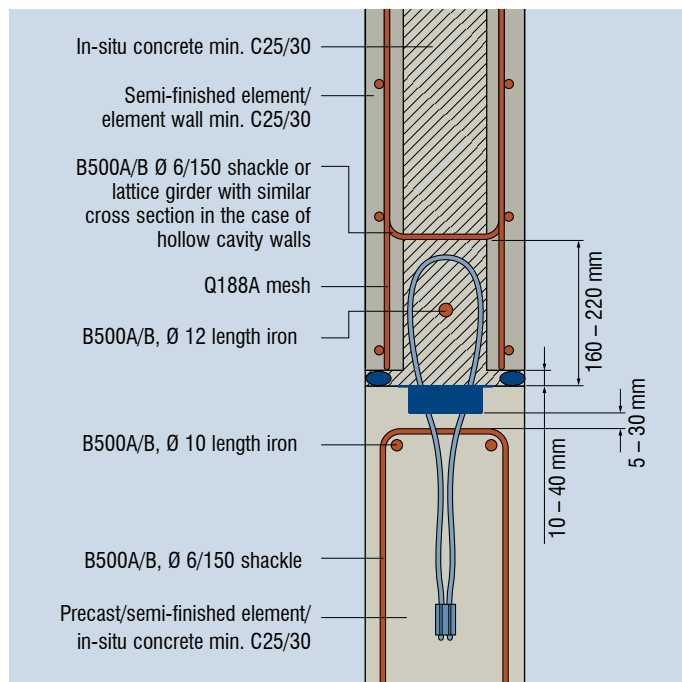
and: $Z_{Ed, V\perp} = 1,0 \cdot V_{Ed, \perp}$

Z_{Rd} [kN/Box]: Design value of tensile force capacity per FS in-situ concrete box according to Appendix 7, Table 1
 $Z_{Ed, N}$ [kN/Box]: Central acting tensile force (per box)
 $Z_{Ed, VII}$ [kN/Box]: Acting tensile force components transverse force parallel to the joint
 $Z_{Ed, V\perp}$ [kN/Box]: Acting tensile force components transverse force perpendicular to the joint



Notice: All three proofs must always be ascertained for parallel, perpendicular and tensile force.

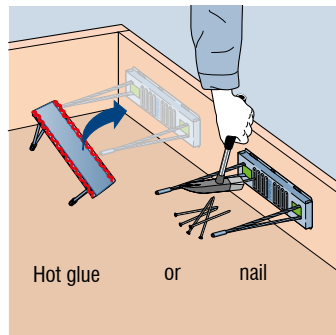
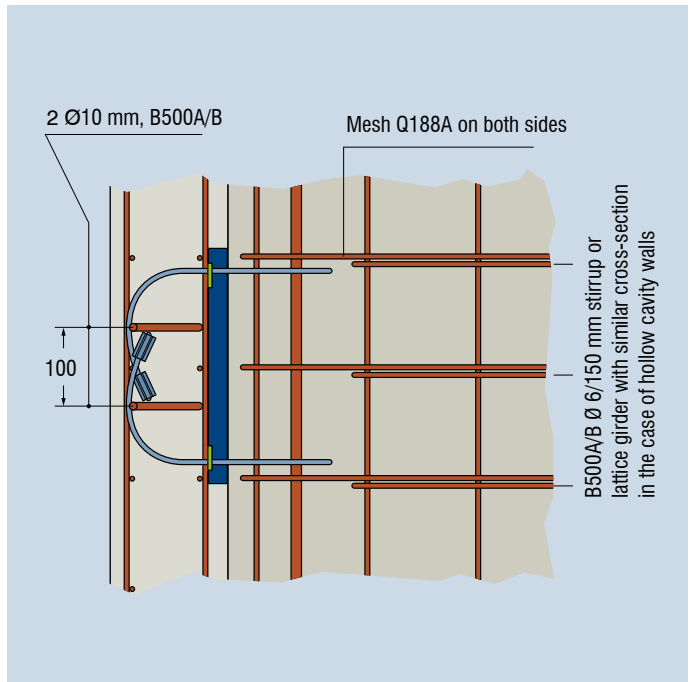
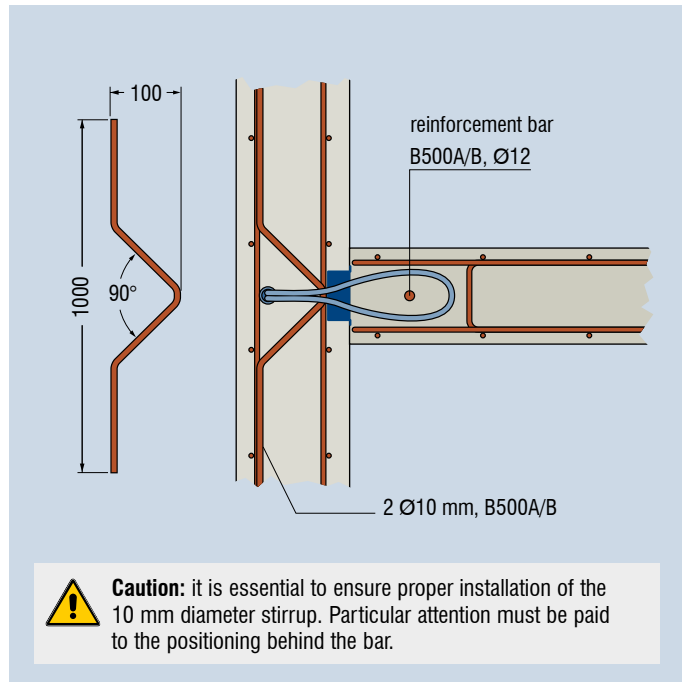
Reinforcement details and minimum dimensions



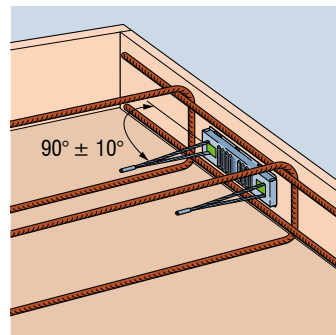
Notice: It also makes sense to use reinforcement shown with purely in-situ concrete addition. See also the valid German general technical approval.



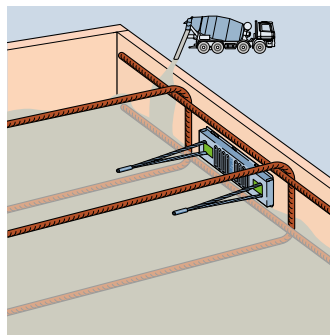
Notice: Do not exceed the maximum distances between wire rope loops and transverse shackles/lattice girders.



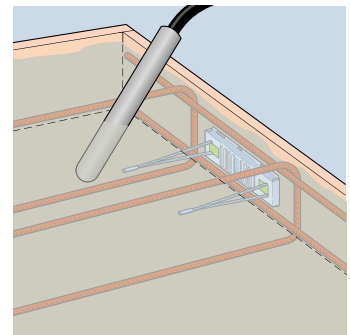
Fix PFEIFER-FS-Box securely to the formwork.



Fit additional reinforcement according to page 9 and/or appendices 4/5 of the approval.



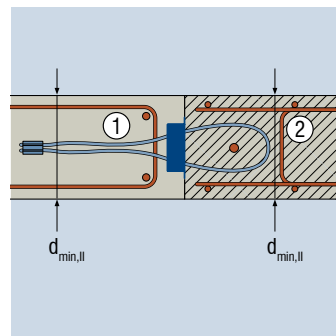
Pour the concrete carefully and pay attention to the built-in components



Carefully compact the concrete, avoiding direct contact between vibrator and the FS-Box.



Notice: The approval texts of the FS box must always be applied in combination with these instructions for installation and use. The approval is always decisive in case of discrepancies.

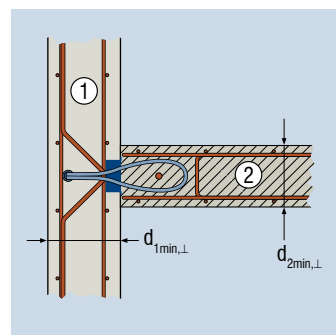


Parallel connection



Notice:

- ① In-situ concrete: $d_{min,II} \geq 140 \text{ mm}$
- ② Semi-precast element: $d_{min,II} \geq 180 \text{ mm}$
– inner width between the shells $\geq 100 \text{ mm}$

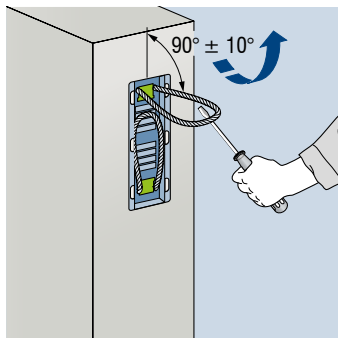
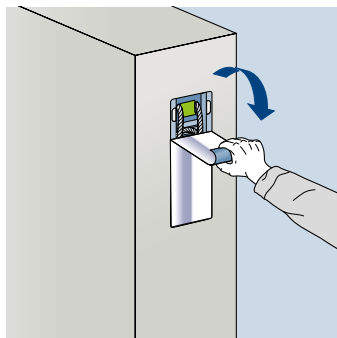


Vertical connection



Notice:

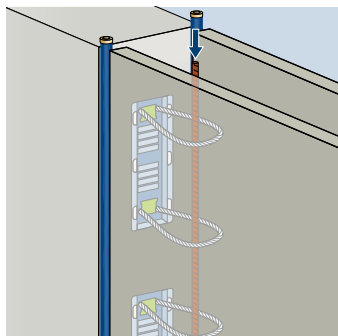
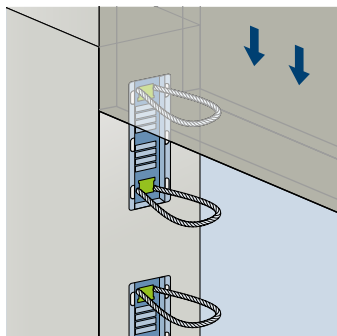
- ① cast in-situ concrete/precast element: $d_{1min,I} \geq 160 \text{ mm}$
Semi-precast element: $d_{1min,I} \geq 200 \text{ mm}$
- ② In-situ concrete: $d_{2min,I} \geq 140 \text{ mm}$
Semi-precast element: $d_{2min,I} \geq 180 \text{ mm}$
– inner width between the shells $\geq 100 \text{ mm}$



Notice: Ensure correct engaging of the rope loop in the recesses of the retaining case.



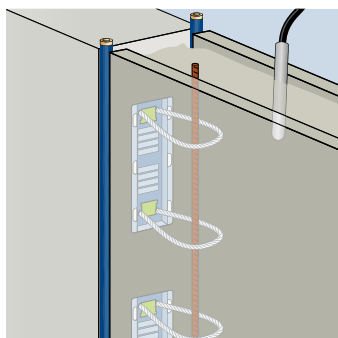
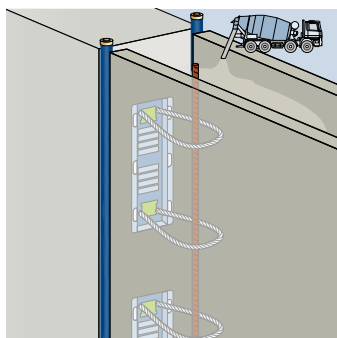
Caution: Ensure that the wire rope loops are perpendicular to the surface (adjust if necessary). Incorrectly aligned loops reduce the design resistances!



Caution: Do not use force to move the wire rope loop. Do not damage. Moved or coated wire rope loops reduce the design resistances.

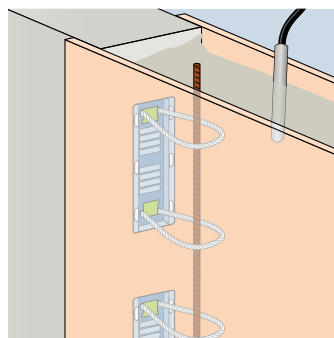


Notice: For the simple lateral sealing of joints during concreting we recommend PFEIFER-FDS joint pressure formwork!



Notice: Pour concrete carefully and compact without forcibly moving the loops.

Alternative in-situ concrete addition with formwork



The final touches: The PFEIFER-VS® FDS Joint Pressure Formwork – for quick, perfect joins between double wall elements



Innovation

- Problem-free joint pressure formwork makes grouting precast element joints easy
- No more “belt and braces” solutions
- No need for special reinforcement



Quality

- High-quality materials for long-lasting elements

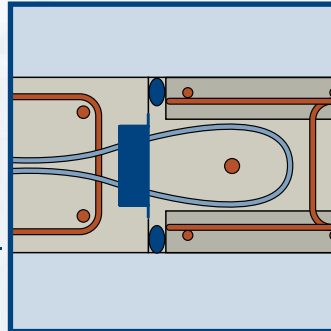


Efficiency

- Space-saving storage
- Long-lasting
- Fast to use
- Time-saving
- No reworking

The PFEIFER-VS® FDS Joint Pressure Formwork makes applying formwork to filling joints as quick as a flash for a perfect seal. Simple to fit and completely waste-free because joint pressure formwork can be reused.

The joint pressure formwork guarantees a tight joint when casting up to 3.50 m in height. After the joint filling has hardened the air is released from the pressure formwork and it is removed, leaving a clean, recessed, slightly rounded smooth joint. This is especially useful for the permanently elastic exterior seal of a building. Wipe the FDS and reuse – quick and economical!



	Lifting Anchor Systems Thread System
	Lifting Anchor Systems BS Anchor System
	Lifting Anchor Systems WK Anchor System
	Fixing Systems DB Anchor 682 for Permanent Fixing
	Fixing Systems Socket Dowels Polyamide Sockets
	Fixing Systems HK Assembly Anchor System
	Connection Systems Column Shoe System Wall Shoe System
	Connection Systems Stell Bearing Staircase Bearing VarioSonic
	Connection Systems Sandwich Anchor System Delta Anchor System
	Connection Systems Concrete Earthing System BEB
	Reinforcement Systems VS®-Wire Rope Loop System
	Reinforcement Systems PH Reinforcement Continuity System
	Cable Tension Members Tension Rod System
	Attachment Materials (Wire Ropes, Chains, Textiles)
	Lashing Systems
	Grabs for Reinforcing Steel Balancing Spreader Beams

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