

TECHNICAL DOCUMENTATION



REBAR CONNECTION SYSTEM | **PSA** **REINFORCEMENT COUPLER**



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INTRODUCTION

Terwa rebar connection system is a high quality, economical reinforcement connection system. The rebar connection system is a simple, efficient method for connecting reinforcement steel, which eliminates the disadvantages of the traditional procedure for lapped joints. The lapped joints system may provide long-term use, greater rebar congestion and unsafe usage in seismic zones.

The design of the couplers allows for a connection of the reinforcement steel in which the characteristics are equivalent to uninterrupted rebar, and the transfer of loads is performed in the bar, not in the concrete as it is for lapped joints. The shape and the metric thread allow for easy mounting at the construction site or using standard tools in the prefab factory.

The characteristics and advantages of the Terwa rebar connection system are:

- Used for reinforcement steel with a diameter from 10 mm to 40 mm.
- The full diameter or cross-section of the bar can be used.
- Complete connection of the reinforcement.
- Suitable for dynamic and seismic loads.
- Slip value of the system under 0.1 mm.
- Additional preparation of the reinforcement steel is not necessary.
- Suitable for all types of reinforcement steel according to the European and American norms.
- The couplers are designed for reinforcement steel B450C, B500B or B500C according to EN 10080 and BS 4449, with a yield strength ≥ 500 MPa and a tensile strength ≥ 550 MPa.
- The shape, height and the type of the ribs of the reinforcement steel have no influence on the connection.
- Since the dimension of the outer diameter is minimal, better concrete coverage is generated, and reinforcement steel congestion can be prevented.
- The contact surfaces of the couplers exclude the use of locknuts.
- Every diameter and length of the reinforcement steel, straight or bent, can be fitted to a coupler and can be easily connected on site.

Installation:

- A nut wrench is not required for tightening the coupling. A pipe wrench or torque wrench has to be used to tighten the couplers and to prevent thread movement.
- Special tools, power sources and special training of personnel are not required.
- The metric thread, connection method allow for fast, easy control of the connection.
- Mounting time is reduced to a minimum.

Characteristics:

- The couplers are delivered in a standard, electrolytic galvanised version, thereby preventing rust.
- At the client's request, the couplers can be made from stainless steel.

Terwa rebar connection system consists of:

- Reinforcement steel:
 - B500A, B500B according to NEN 6008
 - B450C, B500A, B500B, B500C according to EN 10080.
 - B450C, B500A, B500B, B500C according to BS4449.
 - B500A, B500B, B500C according to DIN 488
 - B500A, B500B, B500C according to NF A35-080-1
 - B500A, B500B, B500C according to SFS 1300
 - K500B-T, K500C-T according to SS-EN 10080+SS 212540
 - B500NC according to NS-EN 10080+NS 3576
 - B550B according to EN 10080 and ÖN 4707
- A sleeve with interior thread type PKB, pressed on one or both ends of the reinforcement steel.
- Forged, threaded reinforcement steel, TSE coupler.
- Position coupler TWSK.
- Transition couplers, PSA-T.
- Welding coupler KB-W.
- Fixing connectors KB or KBL.
- Accessories.

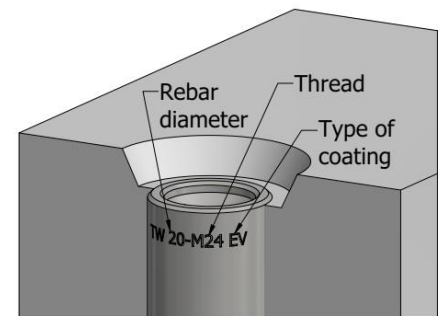
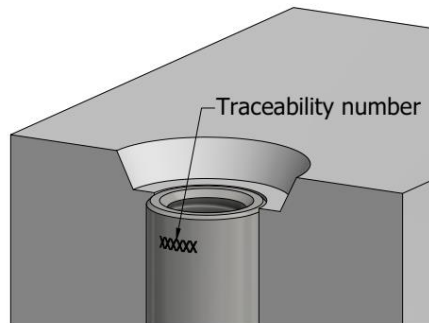
Quality

Terwa continuously controls the anchor production process in terms of strength, dimensional and material quality, and performs all of the required inspections for a superior quality system. All of the products are tracked from material acquisition to the final, ready to use product.



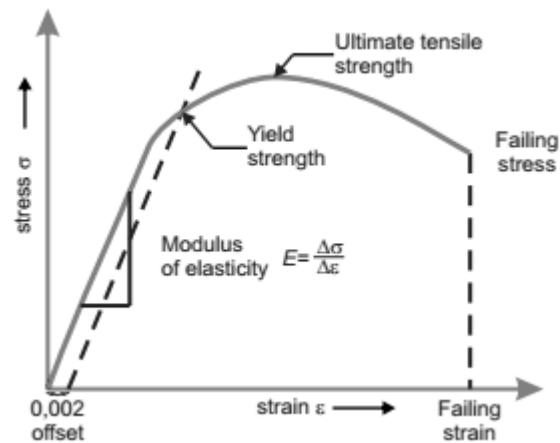
Marking and traceability

All systems have all data necessary for traceability, rebar dimension, thread type and type of coating.



Coupler testing

Terwa rebar couplers are designed to ensure the full transfer of the load to the reinforcement steel and a slip value under 0.1 mm. Terwa periodically tests the system for this in the factory according to the European standards.



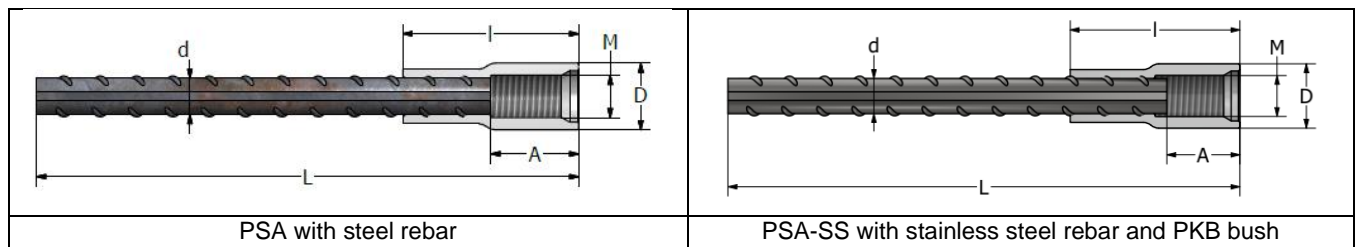
PSA REINFORCEMENT COUPLER

The PSA reinforcement coupler consists of reinforcement steel and a sleeve with interior metric thread pressed on one end. In connection with a reinforcement coupler TSE or PSA-PSC, the PSA coupler ensures uninterrupted reinforcement for all types of precast concrete units. These couplers can be made in various dimensions.

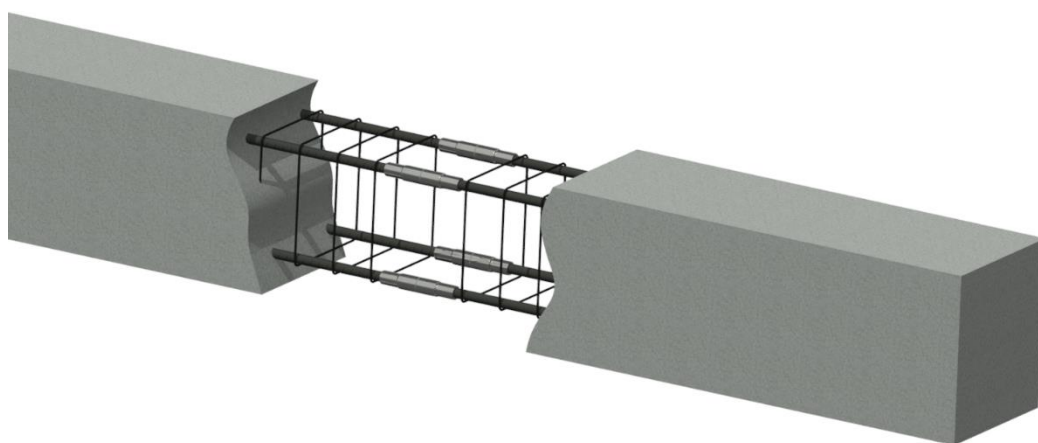
The reinforcement couplers can also be used to lift and move the precast concrete elements.

The PKB couplers are made of structural steel, electrolytic galvanised. The reinforcement steel quality is mentioned on page 3. The rebar can also be made of stainless steel W1.4362 or equivalent.

On request, the PKB couplers can be manufactured in stainless steel or with hot zinc coating.



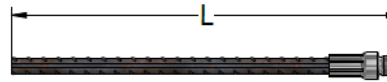





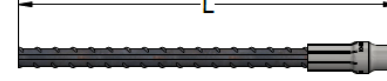

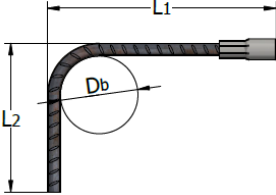
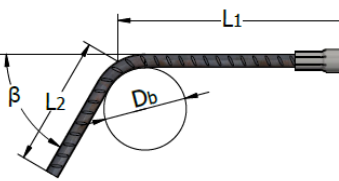
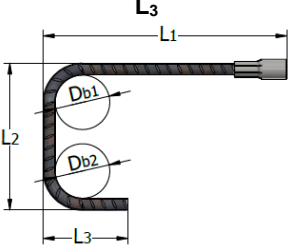
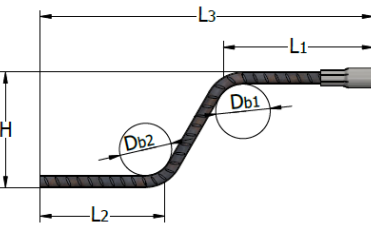
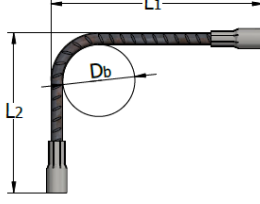
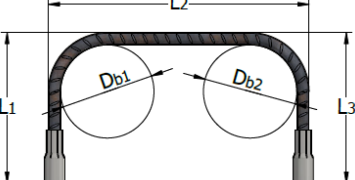
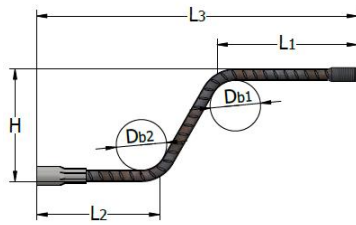
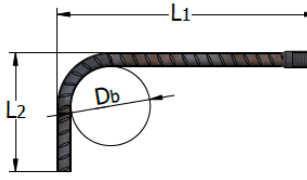
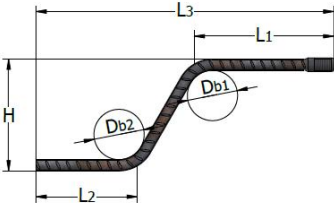




| PSA | | Bush diameter D [mm] | Bush length l [mm] | Rebar diameter d [mm] | Thread | |
|------------------|-------------------|----------------------------|--------------------------|-----------------------------|-------------|-----------|
| Description | Product range no. | | | | Metric M | A [mm] |
| PSA 10 - M12 - L | 90117 | 17.5 | 50 | 10 | 12 | 18 |
| PSA 12 - M16 - L | 90012 | 22 | 62 | 12 | 16 | 25 |
| PSA 14 - M18 - L | 90638 | 25 | 74 | 14 | 18 | 32 |
| PSA 16 - M20 - L | 90013 | 28 | 86 | 16 | 20 | 38 |
| PSA 18 - M22 - L | 91248 | 32 | 92 | 18 | 22 | 40 |
| PSA 20 - M24 - L | 90014 | 34 | 99 | 20 | 24 | 42 |
| PSA 22 - M27 - L | 91246 | 38 | 107 | 22 | 27 | 45 |
| PSA 25 - M30 - L | 90015 | 42.5 | 117 | 25 | 30 | 52 |
| PSA 28 - M36 - L | 90572 | 50 | 130 | 28 | 36 | 55 |
| PSA 32 - M42 - L | 90016 | 56 | 153 | 32 | 42 | 65 |
| PSA 40 - M48 - L | 90175 | 67 | 188 | 40 | 48 | 72 |

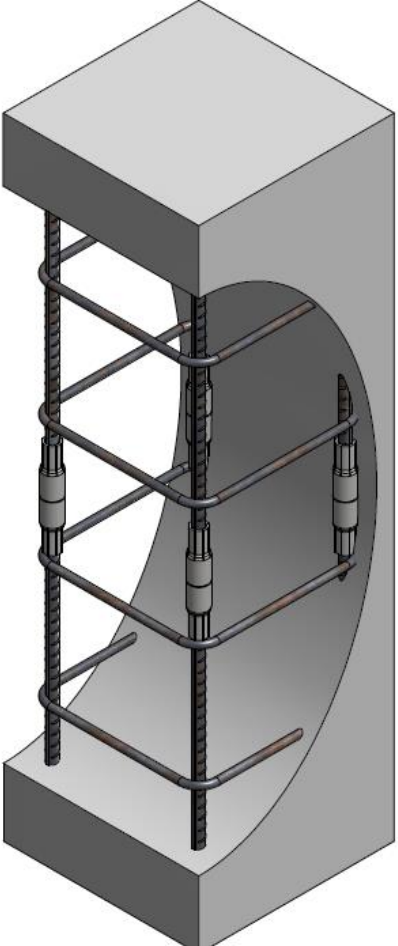
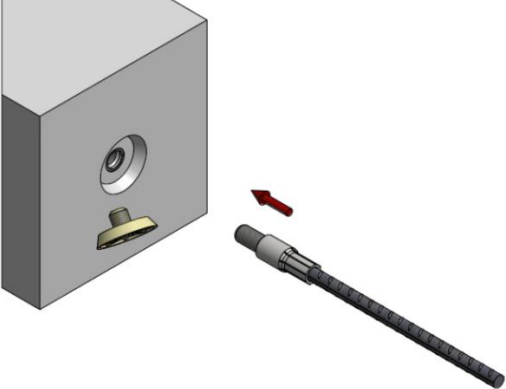
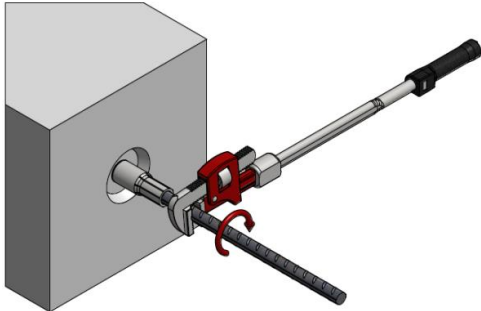


Other lengths are available on request: **PSA – diam. d - thread x length (L) in mm.**

REBAR CONNECTIONS ACCORDING TO CLIENT SPECIFICATIONS

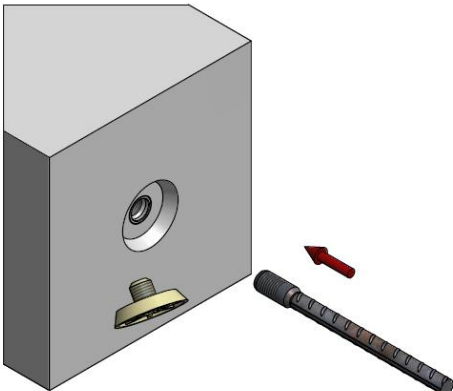
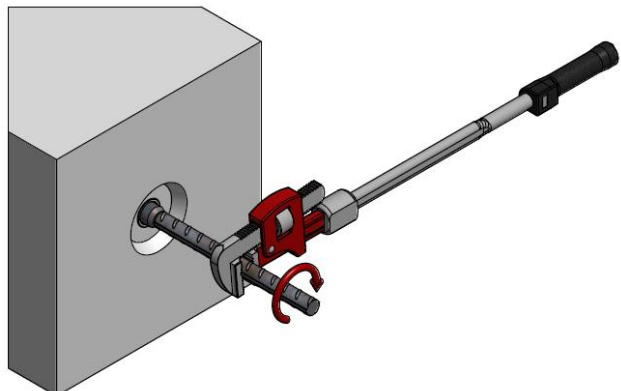
| | | |
|--|---|--|
| <p>PSA rebar diam-thread - L</p>  | <p>PSA-PSC rebar diam-thread - L</p>  | <p>PSA rebar diam-thread - L</p>  |
| <p>PSA rebar diam-thread - L</p>  | <p>PSA rebar diam-thread - L</p>  | <p>PSAD rebar diam-thread - L</p>  |
| <p>PSAD rebar diam-thread - L</p>  | <p>PSAD-2xPSC rebar diam-thread - L</p>  | <p>PSA - rebar diam d1/ d2-thread - L</p>  |
| <p>PSA-TSE rebar diam-thread - L</p>  | <p>PSAG rebar diam-thread - L₁ x L₂</p>  | <p>PSAG rebar diam-thread - L₁ x L₂ x β</p>  |
| <p>PSAGG rebar diam-thread - L₁ x L₂ x L₃</p>  | <p>PSAGG rebar diam-thread - L₁ x L₂ x L₃ x H</p>  | <p>PSAGD rebar diam-thread - L₁ x L₂</p>  |
| <p>PSAGG rebar diam-thread - L₁ x L₂ x L₃</p>  | <p>PSA/TSE GG rebar diam-thread - L₁ x L₂ x L₃ x H</p>  | <p>PSAGD rebar diam-thread - L₁ x L₂</p>  |
| <p>TSEGG rebar diam-thread - L₁ x L₂ x L₃ x H</p>  | <p>PSA-TSE rebar diam-thread - L</p>  | <p>PSA-TSE rebar diam-thread - L</p>  |

INSTRUCTIONS FOR INSTALLING TERWA REBAR COUPLER
INSTALL PSA COUPLER AND CONNECT TO COUPLER PSA-PSC

| | | |
|--|---|---|
|  |  | <p><i>Place and rotate the PSA-PSC coupler manually until the couplers are fastened.</i></p> |
| |  | <p><i>Finish the connection using a special TERWA torque wrench to tighten the connection. The connection must be sufficiently tight to prevent movement during concrete placement. The necessary torque for each type of rebar is shown in the table on page 9.</i></p> |

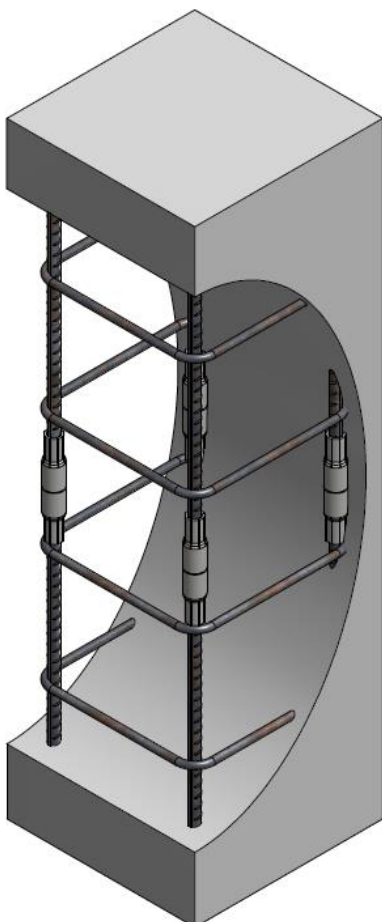
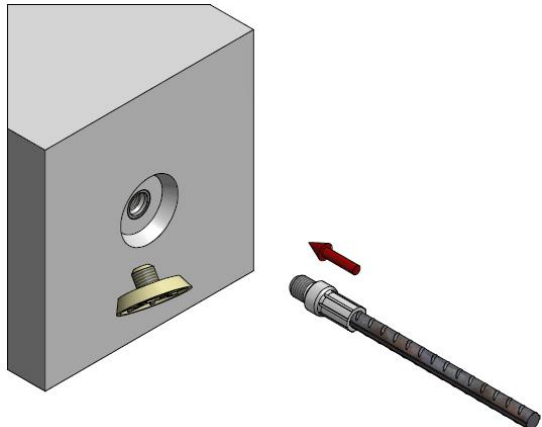
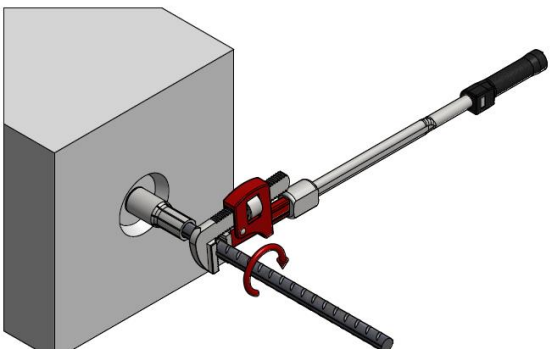
Note: Make sure both parts of the connecting bars are installed exactly in line with one another, as any misalignment may result in reduced concrete coverage, insufficient bar spacing or may compromise mounting of the connecting element. Corrective bending in the threaded zone of the bar is not allowed.

INSTALL COUPLER PSA AND CONNECT TO COUPLER TSE

| | |
|---|---|
|  |  |
| <p>Place and rotate TSE coupler manually until the couplers are fastened.</p> | <p>Finish the connection using a special TERWA torque wrench to tighten the connection. The connection must be sufficiently tight to prevent movement during concrete placement. The necessary torque for each type of rebar is shown on page 9.</p> |

Note: Make sure both parts of the connecting bars are installed exactly in line with one another, as any misalignment may result in reduced concrete coverage, insufficient bar spacing or may compromise mounting of the connecting element. Corrective bending in the threaded zone of the bar is not allowed.

INSTALL PSA COUPLER AND CONNECT TO COUPLER PSA-PSE

| | | |
|---|--|--|
|  |  | <p>Place and rotate PSE coupler manually until the couplers are fastened.</p> |
| |  | <p>Finish the connection using a special TERWA torque wrench to tighten the connection. The connection must be sufficiently tight to prevent movement during concrete placement. The necessary torque for each type of rebar is shown in the table on page 9.</p> |

TERWA TORQUE WRENCH

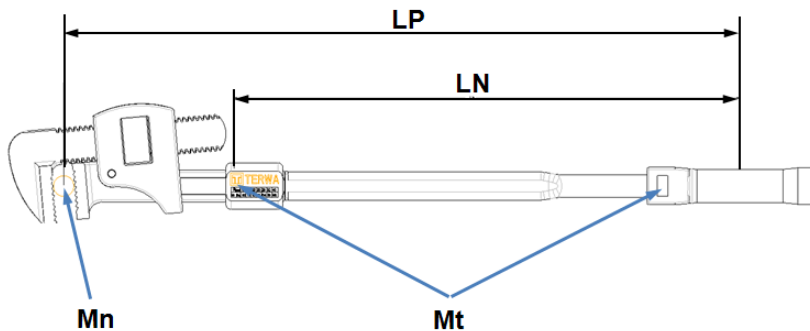
The Terwa torque wrench is specially designed for correctly mounting the Terwa coupler on site and at the factories. All Terwa wrenches are delivered with a calibration report and work instructions.

The torque values for all rebar diameters are marked on the wrench. The torque values for all Terwa couplers are listed below.

| Reinforcement diameter [mm] | Necessary torque for each type of rebar [Nm] | Setting torque using wrench Mt [Nm] |
|-----------------------------|--|-------------------------------------|
| 10 | 50 | 60 |
| 12 | 60 | 60 |
| 14 | 70 | 60 |
| 16 | 80 | 60 |
| 18 | 90 | 70 |
| 20 | 100 | 75 |
| 22 | 110 | 82 |
| 25 | 125 | 93 |
| 28 | 140 | 104 |
| 32 | 160 | 119 |
| 40 | 200 | 148 |



TERWA torque wrench



Mn – required torque
Mt – setting torque using wrench
LP – length to middle of each reinforcement steel
LN – standard length wrench

$$Mt = Mn \times LN / LP$$

TERWA wrench dimensions

CONTACT



TERWA is the global supplier for precast and construction solutions with multiple offices around the world. With all our staff, partners and agents, we are happy to provide all construction and precast companies who work in the building industry with full service and 100% support.

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