

CARES Technical Approval Report TA1-B 5102



Issue 1



Dextra

GROUTEC

DEXTRA Grouted Coupler Groutec S (Roltec thread with lock nut)

Assessment of the
DEXTRA Grouted Coupler
Groutec S (Roltec thread with
lock nut) Product and Quality
System for Production



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Product

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut)

Product approval held by:

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1 Product Summary

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) in size range 16mm to 40mm in both tension and compression against CARES TA1-B using BS4449 rebar grades B500B and B500C.

The Groutec system with Rolltec system, is a dual mechanical and grouted rebar splice solution designed specifically for use in precast concrete elements.

It is important to note that this grouted coupler system has been tested with Fosroc Conbextra(R), a ultra high performance grout whose performance meets the requirements of CARES TA1-B Annex B. If this system is used with any other type of grout then this technical approval is invalid.

1.1 Scope of Application

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) in size range 16mm to 40mm have been evaluated for use as follows:

TA1-B: Eurocode 2 and BS 8110 for static applications in tension and compression using BS4449 grade B500B and B500C in accordance with CARES Appendix TA1-B.

1.2 Design Considerations

BS 8110 Clause 3.12.8.9 Laps and Joints states “Connections transferring stress may be lapped, welded or joined with mechanical devices. They should be placed, if possible, away from points of high stress and should preferably be staggered”. However, BS 8110 Clause 3.12.8.16.2 Bars in tension states “The only acceptable form of full-strength butt joint for a bar in tension comprises a mechanical coupler” satisfying specified slip and tensile strength criteria.



Eurocode 2, Clause 8.7 Laps and mechanical couplers 8.7.1 General (1)P “Forces are transmitted from one bar to another by:

- lapping of bars, with or without bends or hooks;
- welding;
- mechanical devices assuring load transfer in tension-compression or in compression only.”

Clause 8.8 Additional rules for large diameter bars goes on to state that “Splitting forces are higher and dowel action is greater with the use of large diameter bars. Such bars should be anchored with mechanical devices.”

The specified cover for fire resistance and durability should be provided to the coupler sleeve. The couplers as detailed in table 1 have been designed with controlled mechanical properties to be compatible with reinforcing bars complying with reinforcement of the relevant Grade in accordance with BS4449 Grade B500B as detailed in the scope of application section 1.1.

1.3 Conclusion

It is the opinion of CARES that DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) in the size range 16mm to 40mm are satisfactory for use within the limits stated in paragraph 1.1 when applied and used in accordance with the manufacturer’s instructions and the requirements of this certificate.

L. Brankley
 Chief Executive Officer
 December 2025

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2 Technical Specification

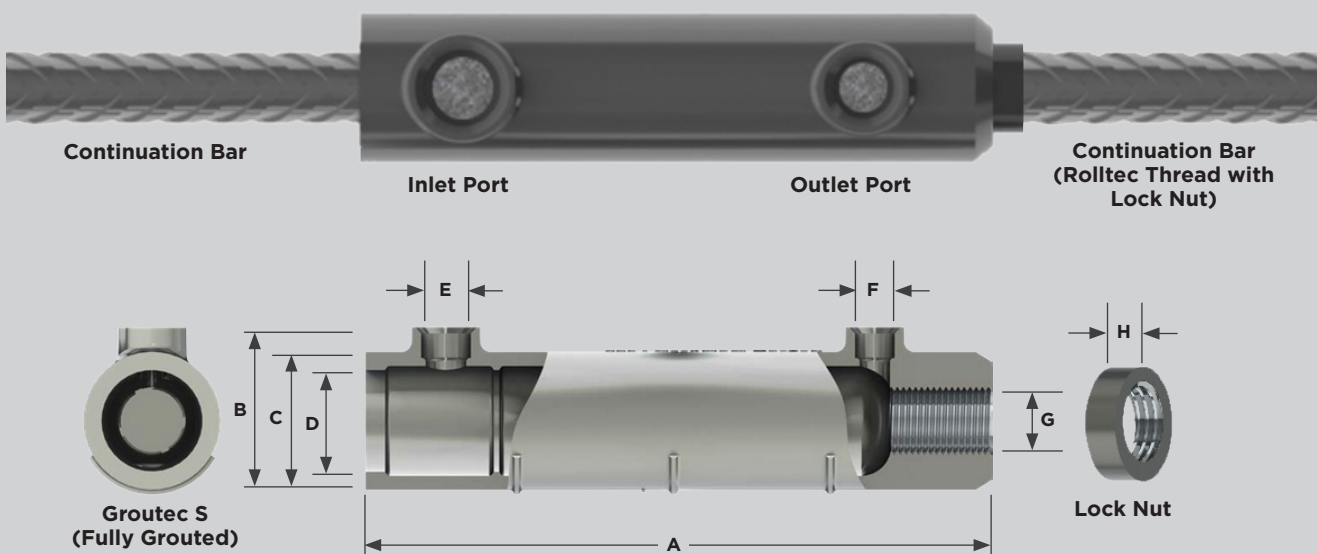
2.1 General

The Groutec system with Rolltec thread is a mechanical splicing system designed for the connection of precast concrete elements.

2.2 DEXTRA Grouted System (with Rolltec thread and lock nut)

The Groutec system with Rolltec thread, is a dual mechanical and grouted rebar splice solution designed specifically for use in precast concrete elements. The system comprises a cast sleeve featuring one Rolltec-compatible threaded end, which enables secure installation of a prepared reinforcement bar, while the opposite end contains a cavity intended for grouting and connection of a continuation bar. The lock nut is used to secure the coupler in its final position, preventing any unintended rotation or loosening during operation. This ensures structural integrity and performance.

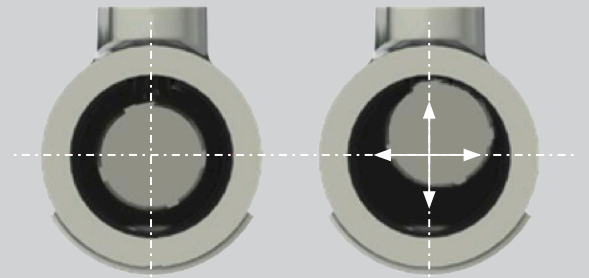
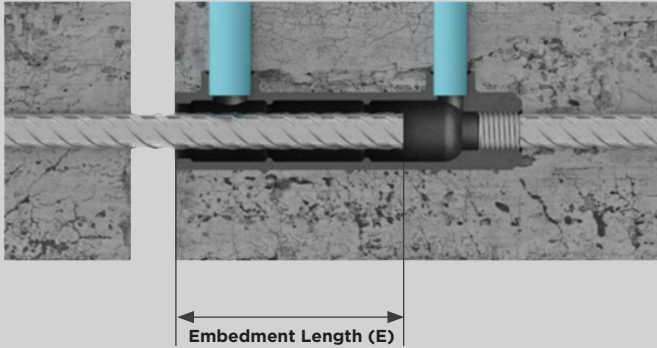
Grouted Coupler Groutec S (Rolltec thread with lock nut)



Size (mm)	Model No	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	Weight (kg)	Plastic protection colour	Tensile Slip	Compression Slip
16	S16	184	57	44	30	25	20	M17 x 1.75	10	1.076	White	B500B/B500C	B500B/B500C
20	S20	204	61	48	34	25	20	M21 x 2.0	10	1.316	Grey	B500B/B500C	B500B/B500C
25	S25	240	67	55	40	25	20	M26 x 2.5	12	1.910	Red	B500B/B500C	B500B/B500C
32	S32	310	80	68	50	25	20	M33 x 3.0	14	3.702	Brown	B500B/B500C	B500B/B500C
40	S40	377	95	83	60	25	20	M41 x 3.0	17	6.780	Green	B500B/B500C	B500B/B500C

Table 1

Grouted Coupler Groutec S Radial Tolerance



Radial Tolerance

Rebar Diameter (mm)	Model	Embedment Tolerance (E)		Radial Tolerance* (mm)
		E min (mm)	E max (mm)	
16	S16	140	155	+/- 5.0
20	S20	150	270	+/- 5.0
25	S25	170	200	+/- 5.0
32	S32	230	260	+/- 7.0
40	S40	280	320	+/- 8.0

Table 2 **Note:** *Radial tolerance is provided as an approximate value based on the nominal rebar diameter and considers the centre of the bar.

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3 Product Performance and Characteristics

Full destructive tests have been carried out to demonstrate compliance with the performance requirements defined in CARES Appendix TA1-B when used with reinforcing steel BS4449 Grade B500C and BS4449 Grade B500B:

CARES APPENDIX TA1-B strength requirements

- Permanent elongation is less than 0.10mm or effective strain of less than 0.0016 at a load of $0.65f_y$ in tension and compression.
- 99% characteristic tensile strength is greater than 575MPa with B500C reinforcing steel and greater than 540MPa with grade B500B reinforcing steel in tension and compression.

4 Installation

4.1 Process

Bars to be spliced are peeled and threaded with a DEXTRA thread rolling machine. The machine must be operated by trained staff following DEXTRA instructions. The threaded bars are then screw and tightened as described in the installation instruction.

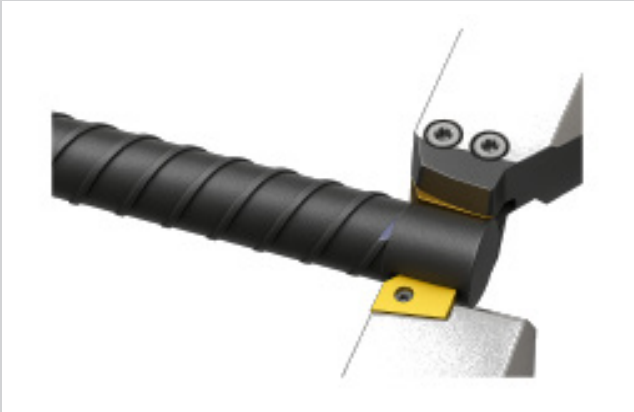


Figure 1 - Peeling

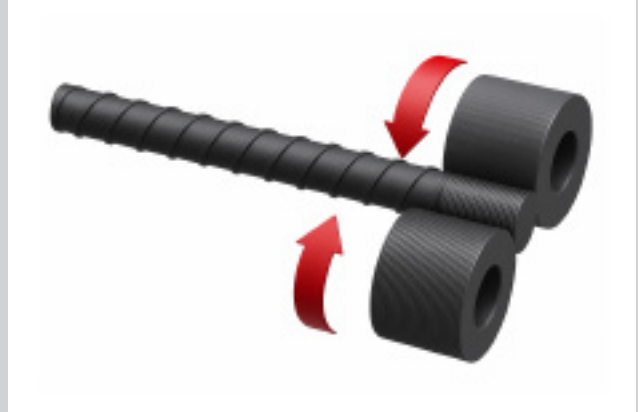


Figure 2 - Thread rolling

4.2 Grout Recommendation

The designated grout for application with the DEXTRA Groutec Coupler is Fosroc Conbextra BB92. This grout complies with all relevant performance specifications required for the intended use, and complies with the requirements of CARES TA1-B Annex B. The grout is CE marked and therefore the manufacturer is subject to annual inspection by a European Notified Body. All mixing procedures and storage conditions must be carried out in strict accordance with the grout manufacturer's instructions to guarantee optimal performance and adherence to technical requirements. If this system is used with any other type of grout then this technical approval is invalid.

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4.3 Groutec Installation Sequence - Injection

Injection method can be applied vertically and horizontally.

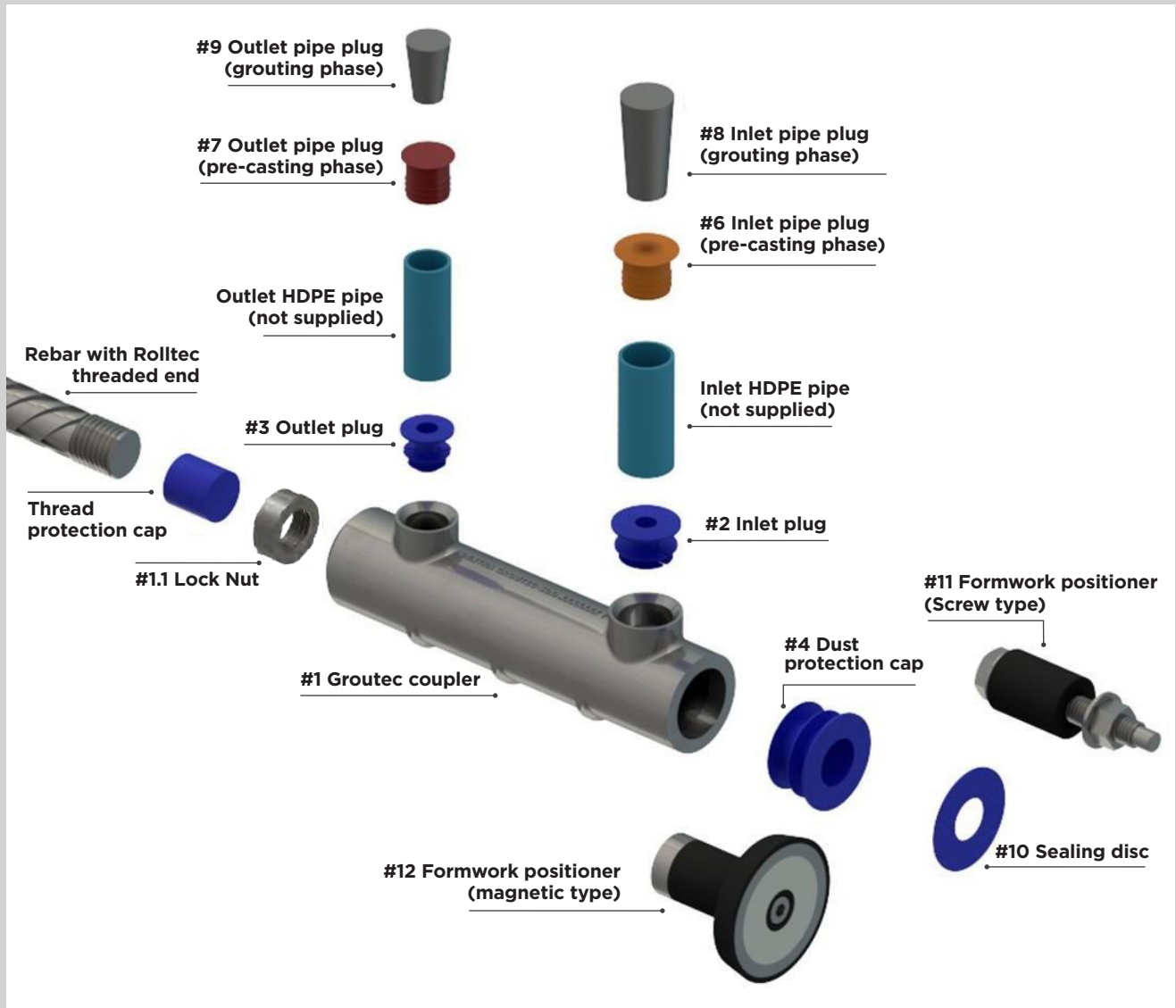
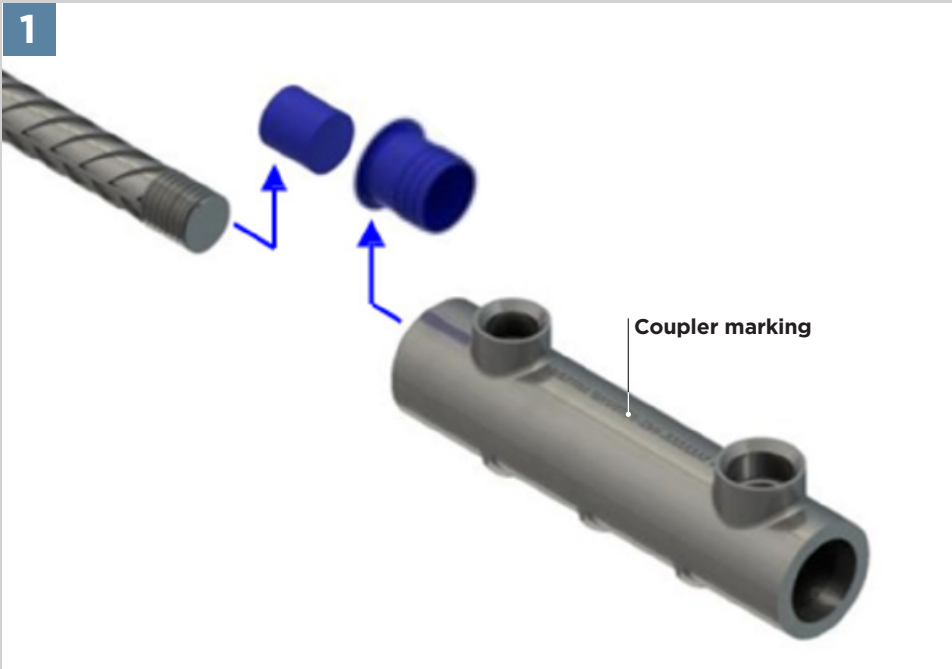




Figure 3 - Groutec system injection components



Prepare the threaded bars

-  Ensure the coupler sleeve caps and threaded bar caps are the same colour.
-  Check from the coupler marking that the coupler corresponds to the correct rebar size.



Screw on lock nut

Hand screw on the lock nut (#1.1) onto the threaded rebar.



Screw on rebar

Hand-screw the threaded bar into the Grouotec coupler (#1). (A wrench may be used if it makes the operation easier).

-  Ensure full thread engagement.





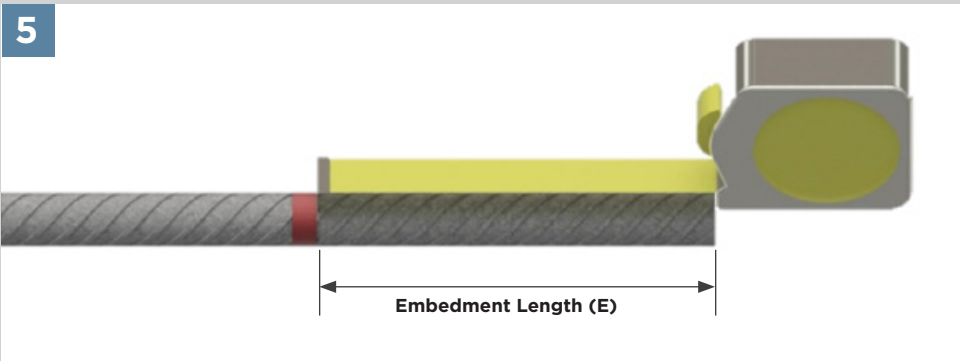


Rebar $\varnothing \leq 32$: L \geq 60cm (24")
Rebar $\varnothing 40$: L \geq 75cm (30")

Lock the splices

Hand-tighten the lock nut towards the Groutec Coupler.
 Tighten the lock nuts with a Stillson or pipe wrench. (No specific torque required.)

-  **Locking ensures permanent elongation meets code requirements.**
-  **After tightening there should be no gap between the sleeve and the lock nut.**

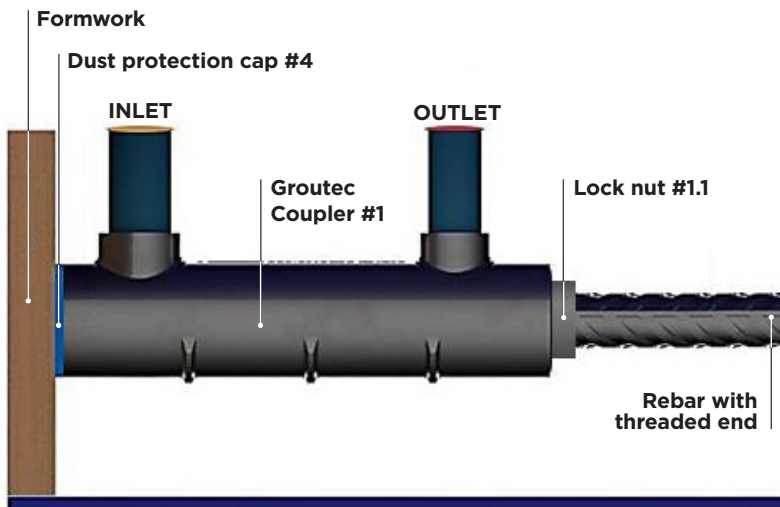


Check embedment length

Measure the minimum embedment length (E_{min}) as per the tolerance table below using a caliper, ruler, or tape measure on the bar. Mark continuation bars visibly.

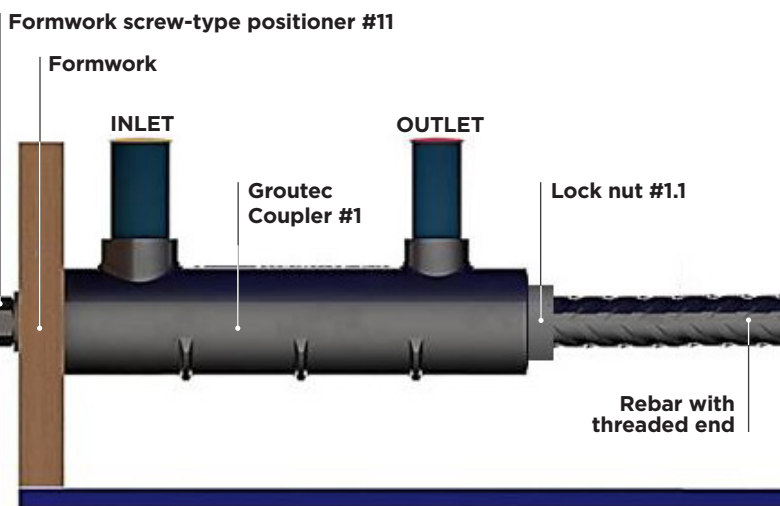
Rebar Diameter (mm)	Model	Embedment Tolerance (E)	
		E min (mm)	E max (mm)
16	S16	140	155
20	S20	150	270
25	S25	170	200
32	S32	230	260
40	S40	280	320

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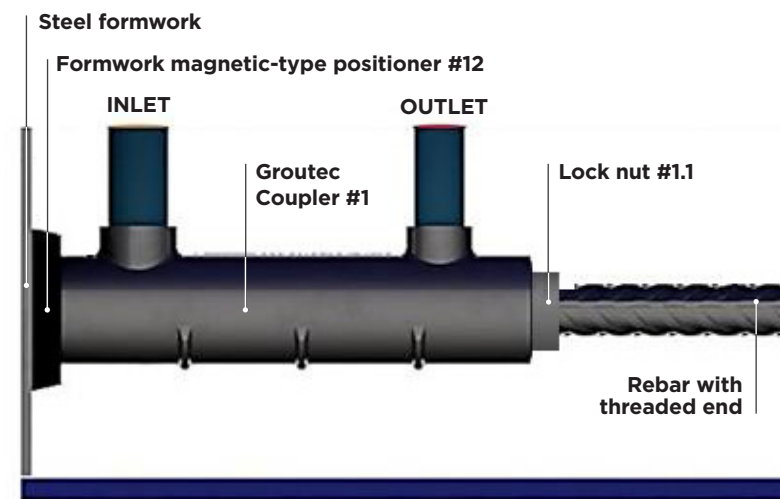
**Installation onto formwork
Without Positioner (#4)**

Ensure the dust protection cap (#4) is present and secure. Position the coupler flush with the formwork; Orient the Grouotec Coupler sleeve to ensure proper alignment of the inlet and outlet ports. Secure the coupler to the reinforcement with wire.



With Positioner (Screw-Type, #11)

Drill the formwork and install the positioner at the correct location. Orient the coupler to ensure proper alignment of the inlet and outlet ports; tighten the lock nut to secure.



**With Magnetic Positioner
(Steel Formwork, #12)**

Lock the magnetic positioner inside the coupler. Pre-position the coupler and rebar and orient the sleeve to ensure proper alignment of the inlet and outlet ports. Secure coupler and rebar with wire.

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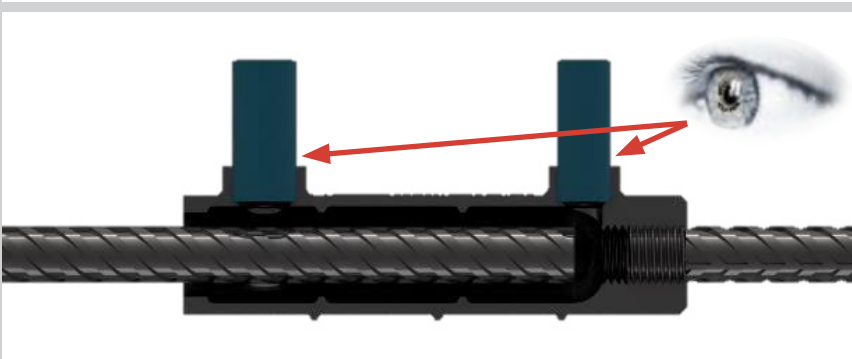


Install the inlet and outlet pipes

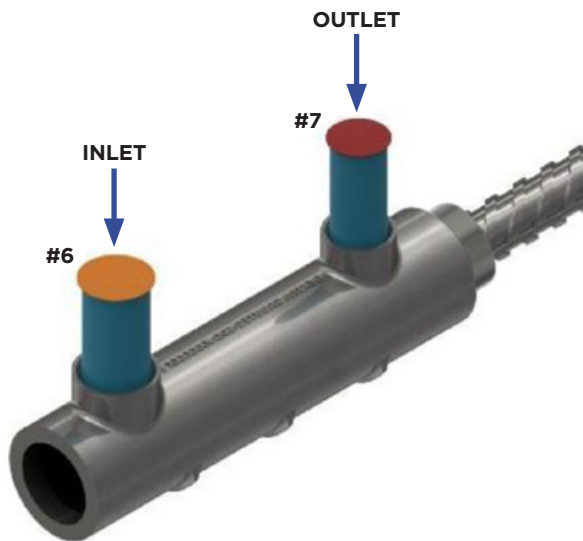
Remove plugs (#2, #3) from the coupler outlet ports.

Insert pipes* into the inlet and outlet ports. (Use a mallet if necessary; pipes should not be removable by hand.)

*Note: Pipes are not supplied; use PE80/PN12.5 pipes per ISO 4427-2 and BS EN12201-2:2003.

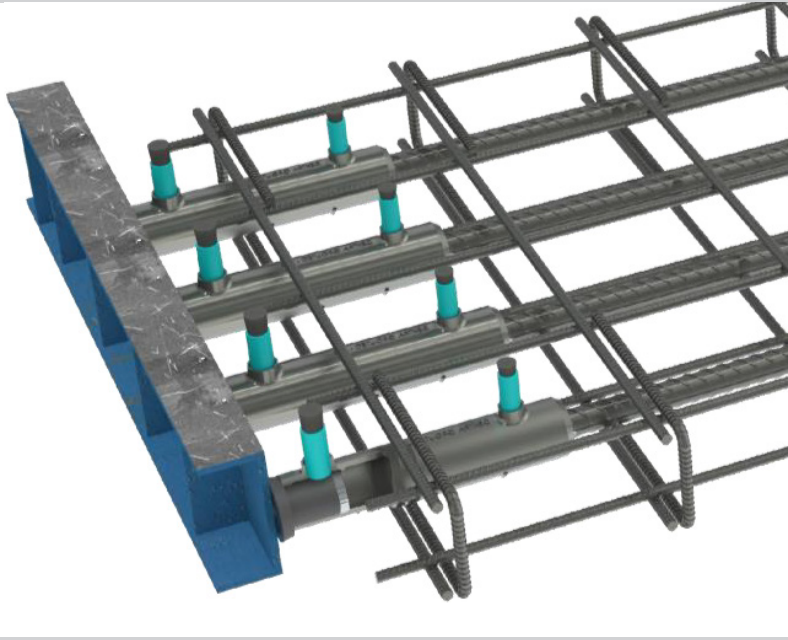


Ensure there are no gaps between pipes, and inlet and outlet ports; seal with adhesive or sealant to close gaps if required.




Close the opposite ends of both pipes with inlet/outlet pipe plugs (#6, #7) or tape; ensure they are tight enough to prevent falling off during handling.


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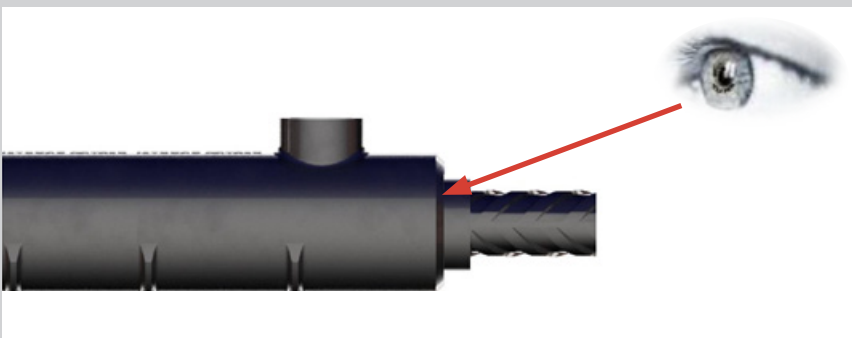
Casting of the concrete element


Close the formwork; ensure couplers and pipes are firmly fixed to prevent movement during vibration.

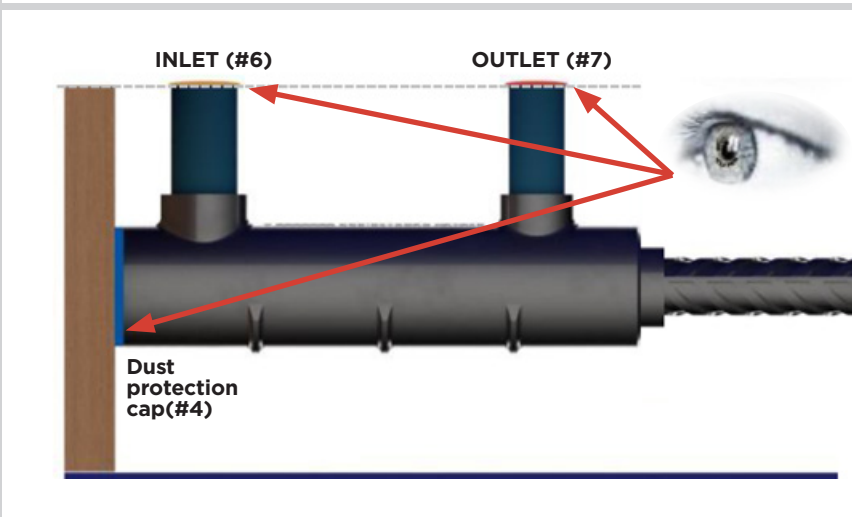
 Inlet and outlet pipes face the correct grout injection direction.

 No gaps exist between pipes and coupler.


 Couplers are orthogonal to the formwork.



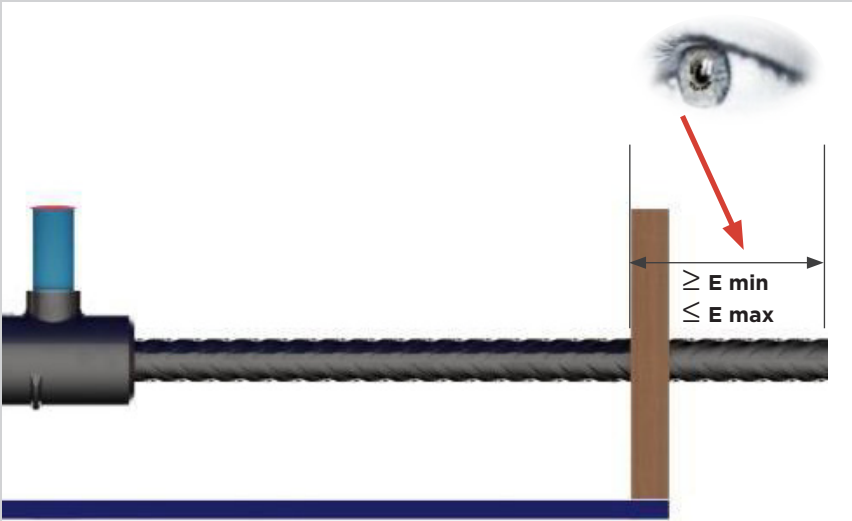
 No gap exists between sleeve and lock nut.




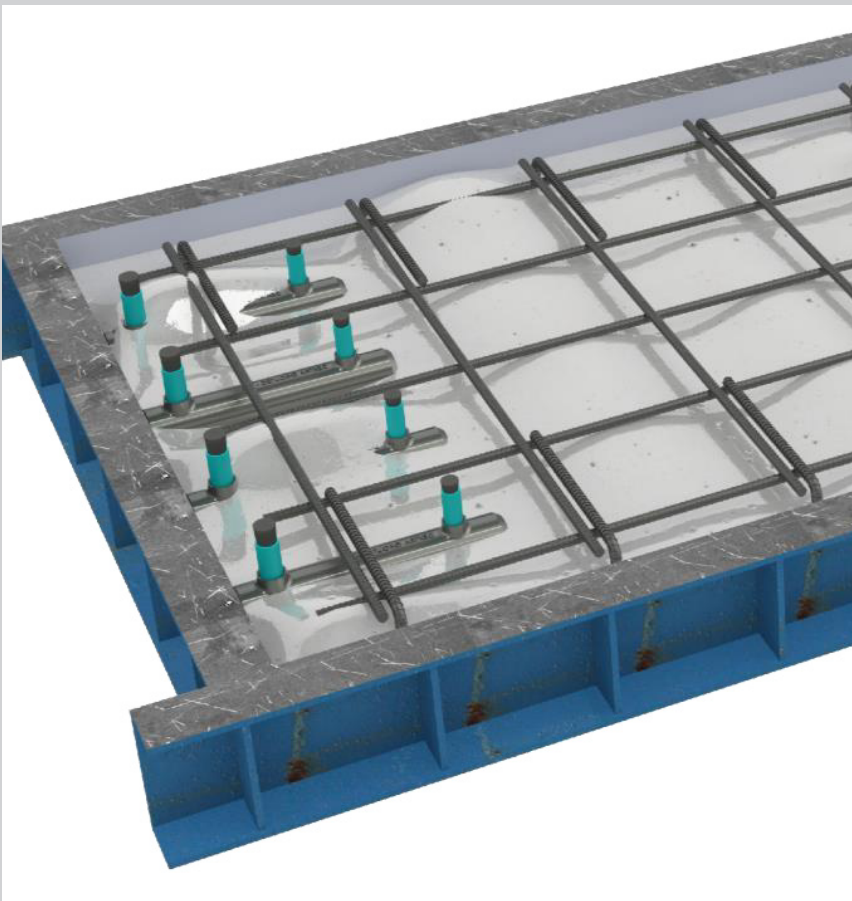
 Couplers are orthogonal to the formwork.

 Pipe plugs (#6/#7) and dust protection cap (#4) are flush and secure.

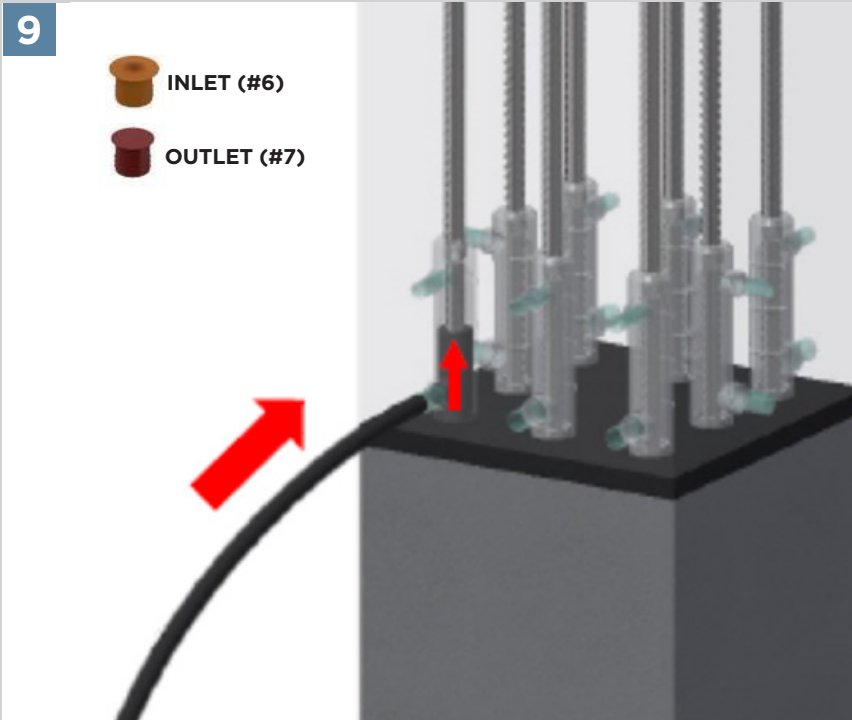
Note: If using alternative formwork installations: Check that Groutec Screw type positioner #11 or Magnetic positioner #12 are flush with the formwork and secure.



 Check rebar length emerging outside of the formwork meets embedment tolerance requirement.



Pour concrete without displacing Inlet and outlet pipes.

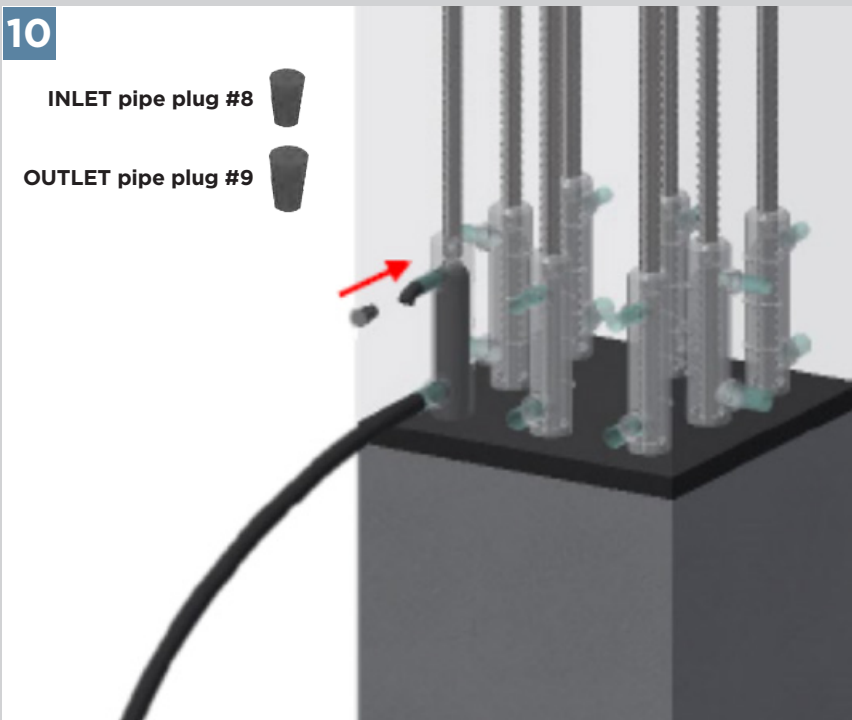


Inject Grout

Remove both pipe plugs (#6/#7) ready for injecting grout

Pump grout through the inlet port of the first sleeve.

When preparing the grout, the manufacturers instructions must be adhered to, thus ensuring a grout which will perform according to requirements. Attention is drawn to the limitation of its use in extreme temperatures, as detailed in its product data sheet.



Plug outlet and inlet pipe

Once grout begins to overflow from the outlet port, seal the outlet pipe with the pipe plug (#9) and inject a small additional amount of grout.

Next, disconnect the injection equipment and immediately close the inlet plug (#8).



5 Safety Considerations

Couplers are supplied in robust cardboard cartons weighting up to 2kg, which may be handled manually with care. Heavier cases require the use of mechanical handling equipment. It is advisable to wear suitable protective gloves during handling the containers, couplers and implementation, as well as during the cutting, upsetting and threading process.

6 Product Testing and Evaluation

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) have been tested to satisfy the requirements of CARES Appendix TA1-B for Couplers with reinforcing bars to BS4449 Grade B500C and BS4449 Grade B500B. The testing comprised the following elements:

- Tensile strength
- Permanent deformation in tension and compression

7 Quality Assurance

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) are produced under an EN ISO 9001 quality management system certified by CARES. The quality management system scheme monitors the production of the couplers and ensures that materials and geometry remain within the limits of this technical approval.

The products are also subject to a programme of periodic testing.

8 Building Regulations

8.1 The Building Regulations (England and Wales)

Structure, Approved Document A

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut), when used in EC2 based designs using the data contained within this technical approval, satisfy the relevant requirements of The Building Regulations (England and Wales), Approved Document A.

Materials and Workmanship, Approved Document

This technical approval gives assurance that the DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) comply with the material requirements of EC2.

8.2 The Building Regulations (Northern Ireland)

Materials and Workmanship

This technical approval gives assurance that DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) comply with the material requirements of EC2 by virtue of regulation 23, *Deemed to satisfy provisions regarding the fitness of materials and workmanship.*

8.3 The Building Standards (Scotland)

Fitness of Materials

This technical approval gives assurance that DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut) comply with the material requirements of EC2 by virtue of *Clause 0.8.*

Structure

DEXTRA Grouted Coupler Groutec S (Rolltec thread with lock nut), when used in EC2 based designs using the data contained within this technical approval, satisfy the requirements of *The Building Standards (Scotland) clause 1.*



9 References

- BS4449: 2005: Steel for the reinforcement of concrete - Weldable reinforcing steel - Bar, coil and decoiled product - Specification.
- BS8110: Part 1: 1997: Structural Use of Concrete, Code of Practice for Design and Construction.
- BS EN 1992-1-1:2004 Eurocode 2 Design of concrete structures - General rules for buildings.
- BS EN ISO 9001: Quality management systems - Requirements.
- CARES Appendix TA1-B; Quality and Operations Schedule for the Technical Approval of Couplers for Reinforcing Steel and Reinforcement Anchors For BS8110 and EN1992-1-1 Applications for Static Loading in Tension or Tension and Compression.

10 Conditions

1. The quality of the materials and method of manufacture have been examined by CARES and found to be satisfactory. This technical approval will remain valid providing that:
 - a. The product design and specification are unchanged.
 - b. The materials, method of manufacture and location are unchanged.
 - c. The manufacturer complies with CARES regulations for technical approvals.
 - d. The manufacturer holds a valid CARES Certificate of Product Assessment.
 - e. The product is installed and used as described in this report.
2. CARES make no representation as to the presence or absence of patent rights subsisting in the product and/or the legal right of DEXTRA to market the product.
3. Any references to standards, codes or legislation are those which are in force at the date of this certificate.
4. Any recommendations relating to the safe use of this product are the minimum standards required when the product is used. These requirements do not purport to satisfy the requirements of the Health and Safety at Work act 1974 or any other relevant safety legislation.
5. CARES does not accept any responsibility for any loss or injury arising as a direct or indirect result of the use of this product.
6. This Technical Approval Report should be read in conjunction with CARES Certificate of Product Assessment No 5102. Confirmation that this technical approval is current can be obtained from CARES.



Groutec S Coupler Applications



**Groutec S Coupler
in columns**



**Groutec S Coupler
in walls**

Groutec S Coupler Applications



**Groutec S Coupler
in pipe racks**



**Groutec S Coupler in
modular precast element**

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