

# CARES Technical Approval Report TA1-F 5089



Issue 1

**Leviat**  
A CRH COMPANY

## **Ancon BT Type A Couplers**

Assessment of the  
Ancon BT Type A  
Coupler Product  
and Quality System  
for Production



# Product

## Ancon BT Type A Coupler for reinforcing steel

### Product approval held by:

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## 1 Product Summary

Ancon BT Type A Couplers in the size range 16mm - 40mm are for the mechanical connection of deformed high-yield carbon steel bars for the reinforcement of concrete complying with the requirements of BS4449 Grade B500B.

By agreement, this Technical Approval is not valid in the United Kingdom, as it acknowledges that the UK Standards Committee rejected ISO15835:2018 during the public comment phase of its introduction.

The introduction of the TA1-F appendix by CARES is to facilitate a Technical Approval scheme incorporating a testing method for couplers in geographical areas where no national approval schemes currently exist.

### 1.1 Scope of Application

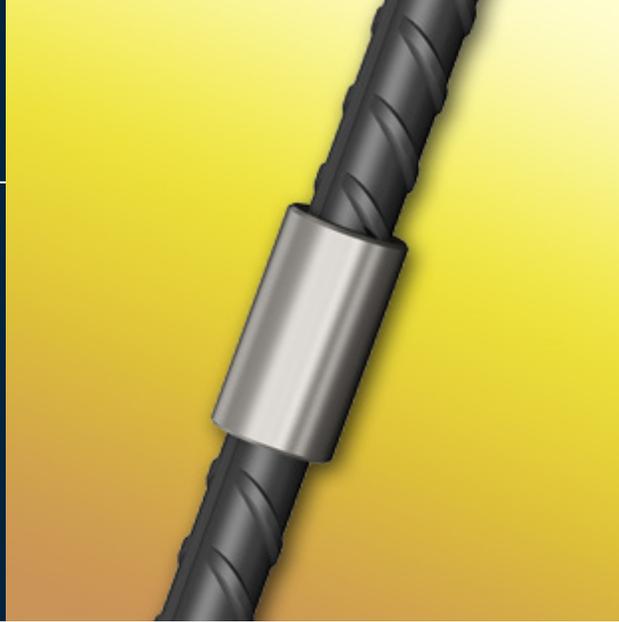
Ancon BT Type A Couplers in the size range of 16mm to 40mm have been evaluated for use as follows:

- a) TA1-F: Eurocode 2 for static applications in tension only with BS4449 Grade B500B reinforcement.
- b) ISO15835-1:2018 Steels for the reinforcement of concrete - Reinforcement couplers for mechanical splices of bars - requirements Type B coupler under predominantly static loads in tension only using BS4449 Grade B500B reinforcement.

### 1.2 Design Considerations

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. All couplers as detailed in table 1 have been designed with controlled mechanical properties to be compatible with reinforcing bars complying with BS4449 Grade B500B.

### 1.3 Conclusion

It is the opinion of CARES that Ancon BT Type A Couplers 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  
 July 2023

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## 2 Technical Specification

### 2.1 General

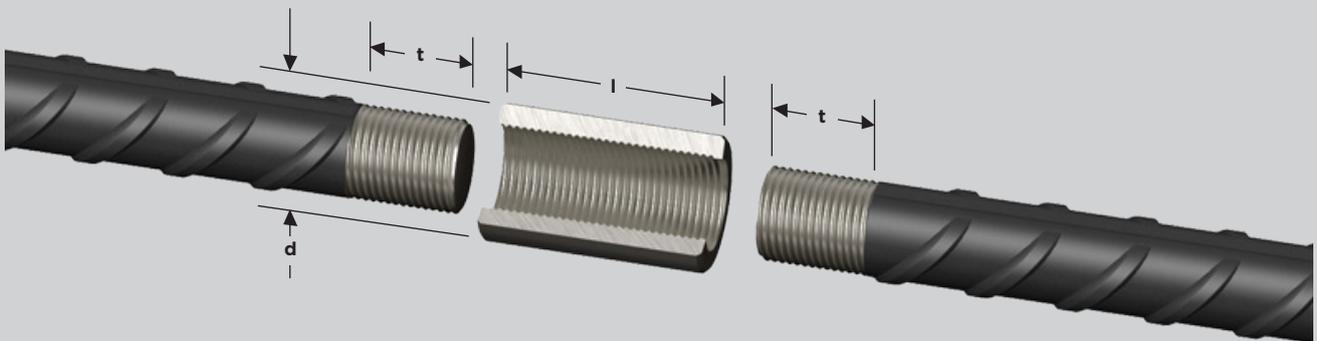
The function of the Ancon BT Type A Coupler is to connect deformed steel reinforcing bars complying with BS 4449 Grade B500B, as appropriate, and thereby create structural continuity of the reinforcing system.

Ancon BT Type A Couplers offer a full strength connection. Each end of the bar to be joined is cut square and enlarged using a cold forging process. A parallel metric thread is then cut onto the enlarged bar end. The thread form is such that the cross sectional area of the bar ends is not reduced, thus ensuring the strength of the connection matches or exceeds that of the parent bars.

### 2.2 Ancon BT Type A Coupler

Ancon BT Type A parallel thread couplers have an internally threaded steel sleeve. The bar ends are processed to allow standard parallel metric threads to be cut onto the bar without reducing the overall cross-sectional area of the parent bar. The Type A coupler is suitable for applications where one of the bars to be spliced can be rotated.

#### Ancon BT Type A Standard Couplers



Reinforcing Bar Diameter	16mm	20mm	25mm	32mm	40mm
External diameter, d	28	32	40	50	62
Coupler length, l	40	48	60	78	98
Thread Size	M20	M24	M30	M36	M45
Thread Pitch	2.5	3.0	3.5	4.0	4.5
Thread Length, t	20	24	30	36	45
Rebar grade	B500B	B500B	B500B	B500B	B500B
Tension only	✓	✓	✓	✓	✓

Table 1

### 3 Product Performance and Characteristics

Full destructive tests have been carried out to demonstrate compliance with the performance requirements defined in CARES Appendix TA1-F coupler when used with reinforcing steel BS4449 grade B500B as appropriate as detailed in tables 1.

#### CARES APPENDIX TA1-F strength requirements

- Permanent deformation is less than 0.10mm after loading to 60% of the specified characteristic yield strength value of the reinforcing bar in tension with BS4449 grade B500B reinforcement, tested in accordance with option 2 of ISO15835-1 clause 5.4.1.
- The relaxed slip requirements for couplers longer than 100mm and calculation of slip as a median as defined in ISO 15835-1:2018 clause 5.4.2 is not be permitted for couplers approved under this TA1-F schedule

#### ISO15835-1:2018 requirements for slip and tensile strength

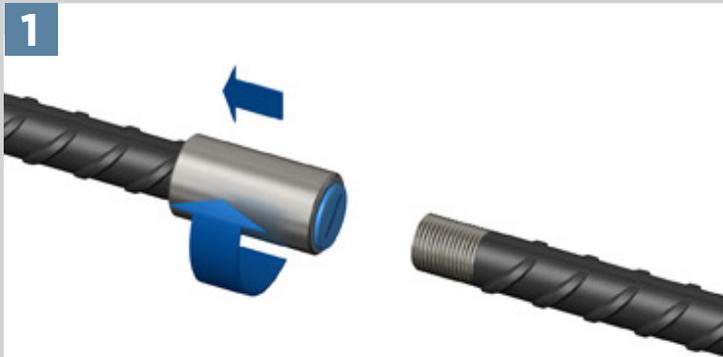
Tests verify compliance with Clauses 5.3 and 5.4 of ISO15835-1:2018 for the following for an ISO15835 category “B” coupler as defined in table 2:

- a) slip under static forces; and
- b) tensile strength and ductility under static forces.

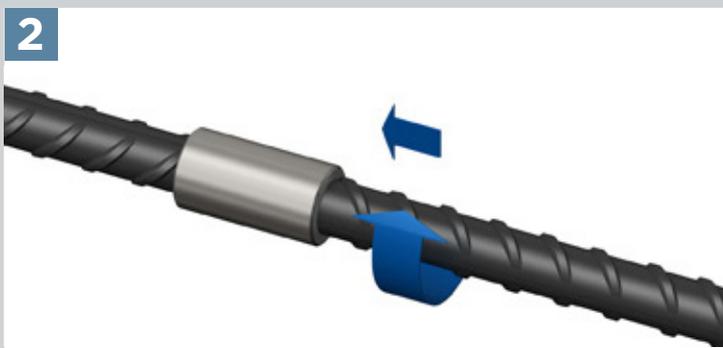


## 4 Installation

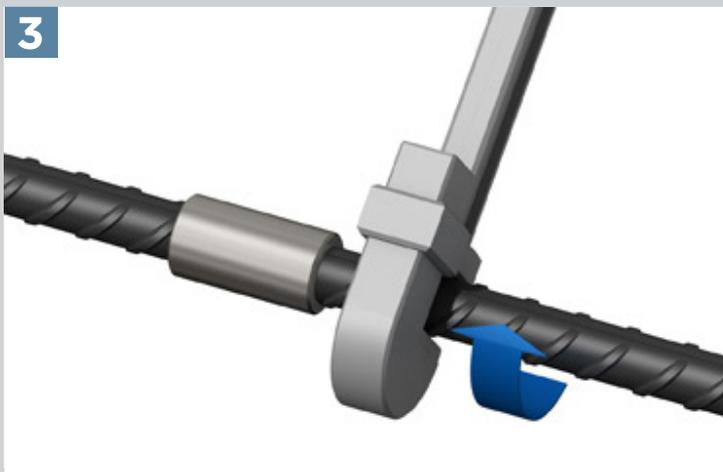
### Ancon BT Type A Coupler



Screw the coupler to the rear of the thread on the fixed bar and lock tight. The bar end should be central within the length of the coupler. Remove the plastic cap from the coupler.



Position and rotate the continuation bar in the coupler.



Tighten the joint using a wrench on the continuation bar. After tightening there should be no more than 2 - 4mm of thread exposed, depending on the diameter of the rebar.

## 5 Safety Considerations

Couplers are supplied in robust cardboard cartons weighting up to 25kg, 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



Ancon BT Type A Couplers have been tested to satisfy the requirements of CARES Appendix TA1-F for Couplers with reinforcing bars to BS4449 Grade B500B as appropriate. The testing comprised the following elements:

- Tensile Strength
- Ductility
- Permanent deformation in tension

Tests verify compliance with Clauses 5.3 and 5.4 of ISO15835-1:2018 for tensile strength, ductility and slip under static forces.



## 7 Quality Assurance

Ancon BT Type A Couplers for reinforcing steel are produced under a BS EN ISO9001 quality management system certified by CARES at locations agreed with CARES.

The quality management system scheme monitors the production of the Standard Couplers and ensures that materials and geometry remain within the limits of this technical approval.

The products are subject to a programme of periodic testing to ensure continued compliance.



## 8 Materials and Workmanship

This technical approval gives assurance that the Ancon BT Type A Couplers to reinforcing steel comply with the material requirements of EC2.

## 9 References

- BS4449: 2005 Steel bars for the reinforcement of and use in concrete - Requirements and test methods.
- ISO15835-1:2018 Steels for the reinforcement of concrete - Reinforcement couplers for mechanical splices of bars - Part 1: Requirements
- 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-F: Quality and Operations Schedule for the Technical Approval of Couplers for high cycle fatigue and low cycle loading and static loading applications in tension

## 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 Leviat Sdn. Bhd. 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 5089. Confirmation that this technical approval is current can be obtained from CARES.





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