CARES Technical Approval Report TA1-B 5101

Issue 1

Changzhou Jianlian Reinforcing Bar Conjunction Co., Ltd (JBCZ)

JBCZ Bolted Coupler

Assessment of the JBCZ Bolted Coupler Product and Quality System for Production

TECHNICAL APPROVAL 5101

0002

Validate with the CARES Cloud App

Product

JBCZ Bolted Coupler for reinforcing steel

Product approval held by:

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1 Product Summary

JBCZ Bolted Couplers in the size range 16mm - 32mm are for the mechanical connection of deformed high-yield carbon steel bars for the reinforcement of concrete complying with the requirements of BS4449 Grades B500B.

1.1 Scope of Application

JBCZ Bolted Couplers in the size range of 16mm to 32mm have been evaluated for use as follows:

a) TA1-B: Eurocode 2 and BS 8110 for static applications in tension only with BS4449 Grade B500B reinforcement.

b) BS8597:2015 for mechanical splices in reinforced concrete structures under predominantly static loads in tension only using BS4449 Grade B500B reinforcement.

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. All couplers have been designed with controlled mechanical properties to be compatible with reinforcing bars complying with reinforcement of the relevant Grade in accordance with BS4449.

1.3 Conclusion

It is the opinion of CARES that JBCZ Bolted Couplers in the size range 16mm to 32mm 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

2 Technical Specification

2.1 General

The function of JBCZ Bolted Couplers is to connect deformed steel reinforcing bars complying with BS4449 Grade B500B and thereby create structural continuity of the reinforcing system. Bolted couplers allow for more freedom on site and allow for connection of rebars which may already be embedded in concrete, or in repair situations of existing structures.

JBCZ Bolted Couplers offer a full strength connection. The ends of the rebar to be connected are upset forged to allow for good thread formation and ultimate connection to the coupler.

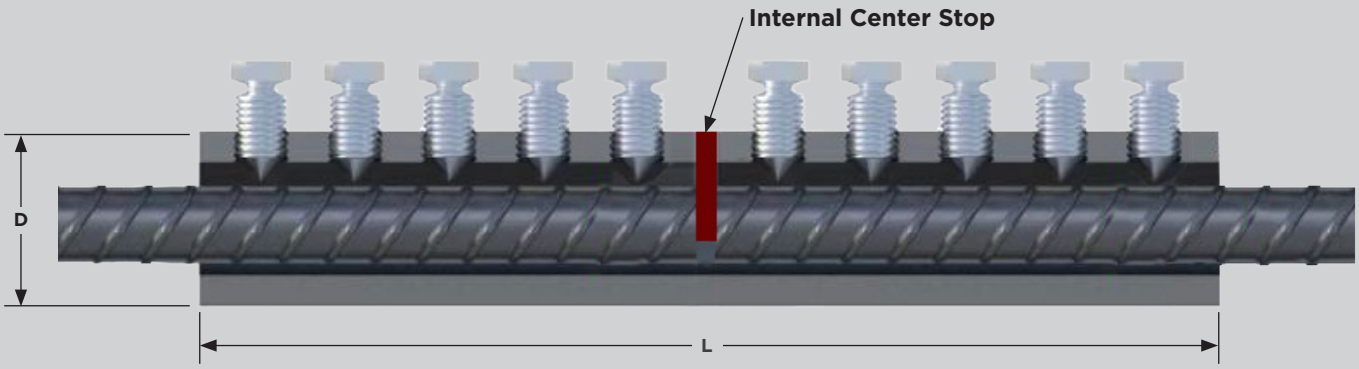
2.2 JBCZ Bolted Coupler

JBCZ Bolted couplers are designed for concrete-embedded bars, repair and retrofit works, and bent bars.

Preparation of the reinforcing bar end is not needed. The Bolted coupler can be installed on site with a standard torque wrench. (Larger sizes need a power tool). Proper installation has been achieved once the bolt heads have sheared off.

It comprises of a steel sleeve, with precision shear bolts which shear at a predefined torque when tightened against the inserted rebar.

JBCZ Bolted Couplers



Size (mm)	Diameter D (Ømm)	Length L (mm)	Shear Bolts Size	Shear Bolts Quantity	Shear Bolts Torque (Nm)	Net Weight (kg)	TA1B B500B Tension only
16	37	159	M14	6	205	1.2	✓
20	44	191	M14	8	205	1.8	✓
25	54	311	M16	10	475	4	✓
32	65	396	M21	10	680	7.5	✓

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-B when used with reinforcing steel BS4449 grade B500B.

CARES APPENDIX TA1-B strength requirements

- Permanent deformation is less than 0.10mm after loading to 0.65f_y in tension with BS4449 grade B500B reinforcement.
- 99% characteristic tensile strength is greater than 540MPa with BS4449 grade B500B reinforcement.

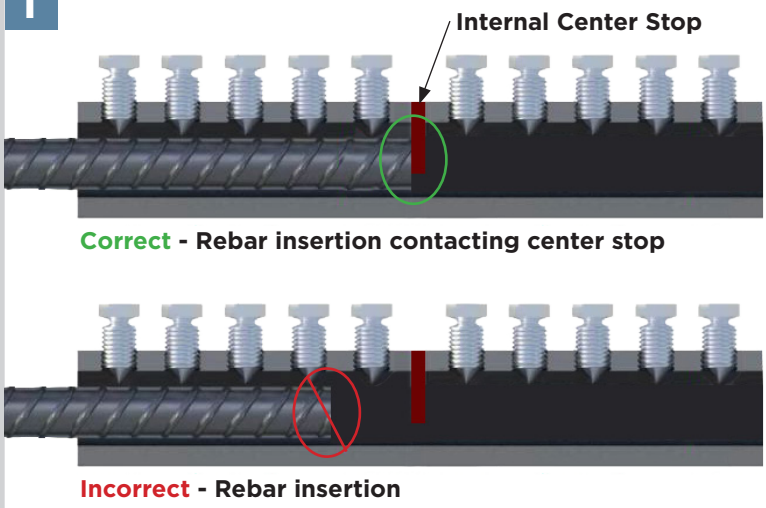
BS 8597:2015 requirements for slip and tensile strength

Tests verify compliance with Clause 5 of BS 8597;2015 for the following:

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

4 Installation

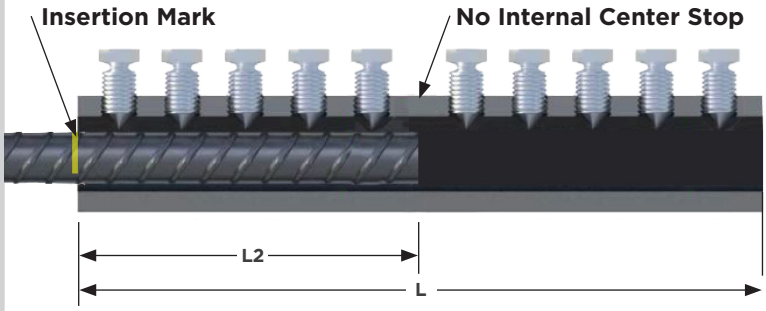
1



First Rebar - Insertion

Insert the bolt coupler onto the end of the first rebar until the end of the rebar butts up against the internal center stop of the coupler.

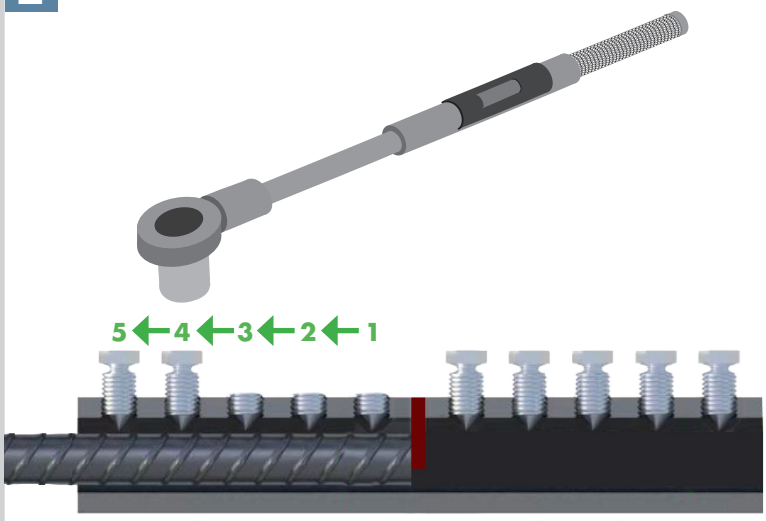
The rebar must be inserted to the correct length.



If the coupler has no center stop, or if the stop has been removed, measure and mark the rebar at a distance equal to half the coupler length (L2).

Then, insert the coupler onto the rebar.

2



First Rebar - Torque Wrench Tightening

Use a torque wrench to tighten the screws sequentially, starting from middle of the coupler and moving gradually toward the end.

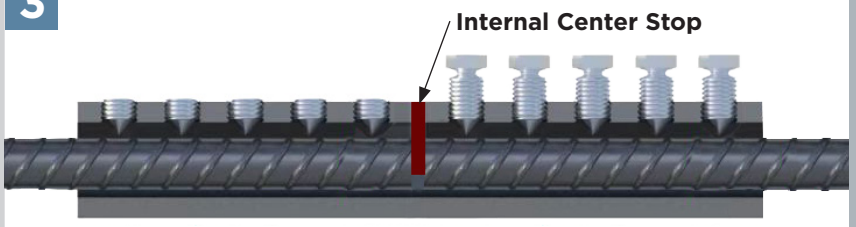
Each screw should be tightened until the screw head breaks off.

See torque values in table 2 below.

Rebar Size	16	20	25	32
Bolt Torques (Nm)	205	205	475	680

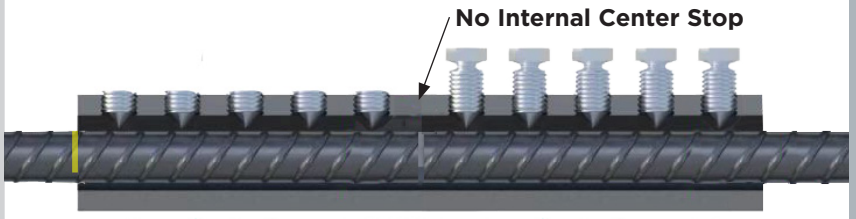
Table 2

3



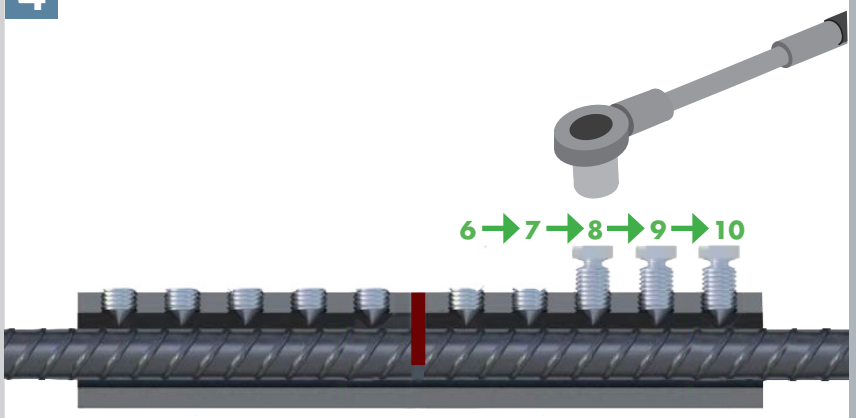
Second Rebar - Insertion

Once the screws for the first rebar have been tightened and heads twisted off, insert the second rebar into the coupler until it butts up against the internal center stop.



If the coupler has no center stop, insert the second rebar until it butts up against the first rebar.

4



Second Rebar - Wrench Tightening

Tighten the screws until the heads twist off working from the middle of the coupler toward the end of the coupler.

See torque values in table 2.

5

Finished Coupler

All heads must be sheared to confirm their correct application to the rebar.

5 Safety Considerations

Couplers are supplied in 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 cartons, couplers and implementation, as well as during the rebar cutting and tightening the screws.

6 Product Testing and Evaluation

JBCZ Bolted Couplers have been tested to satisfy the requirements of CARES Appendix TA1-B for Couplers with reinforcing bars to BS4449 Grade B500B. The testing comprised the following elements:

- Tensile Strength
- Permanent deformation in tension

Tests verify compliance with Clause 5 of BS 8597;2015 for both slip under static forces and tensile strength under static forces.

7 Quality Assurance

JBCZ Bolted Couplers for reinforcing steel are produced under a EN ISO 9001 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 Building Regulations

8.1 The Building Regulations (England and Wales)

JBCZ Bolted Couplers, 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 JBCZ Bolted Couplers comply with the material requirements of EC2.

8.2 The Building Regulations (Northern Ireland)

Materials and Workmanship

This technical approval gives assurance that JBCZ Bolted Couplers 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 JBCZ Bolted Couplers comply with the material requirements of EC2 by virtue of *Clause 0.8*.

Structure

JBCZ Bolted Couplers, 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 bars for the reinforcement of and use in concrete - Requirements and test methods.
- BS8110: Part 1: 1997: Structural Use of Concrete, Code of Practice for Design & Construction
- BS 8597:2015 Steels for the reinforcement of concrete – Reinforcement couplers – Requirements and test methods.
- 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 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 provided 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 Changzhou Jianlian Reinforcing Bar Conjunction Co., Ltd 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 etc 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 5101. Confirmation that this technical approval is current can be obtained from CARES.

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TECHNICAL APPROVAL 5101

UKAS PRODUCT CERTIFICATION 0002

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Independent Product Assessments for the Construction Industry

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