CARES Technical Approval Report TA1-F 5104

Issue 1

F-TIVE Splicing Sdn Bhd
BSS Upset Forged Rebar Parallel Threaded Coupler

Assessment of the F-TIVE Splicing Sdn Bhd BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Coupler splicing methods. Product and Quality System for Production

TECHNICAL APPROVAL 5104

0002

TO BE ISSUED ON CERTIFICATION

Validate with the CARES Cloud App

Product

F-TIVE Splicing Sdn Bhd
BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Coupler splicing methods for reinforcing steel

Product approval held by:

F-TIVE Splicing Sdn Bhd
No. 42, Jalan BP 5/10
Bandar Bukit Puchong
Selangor 47120
Malaysia
Tel: +60122957216
Email: info@f-tive.com

1 Product Summary

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Coupler splicing methods in the size range 13mm - 40mm are for the mechanical connection of deformed high-yield carbon steel bars for the reinforcement of concrete complying with the requirements of SS560 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

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Coupler splicing methods in the size range of as detailed in table 1 and 2 have been evaluated for use as follows:

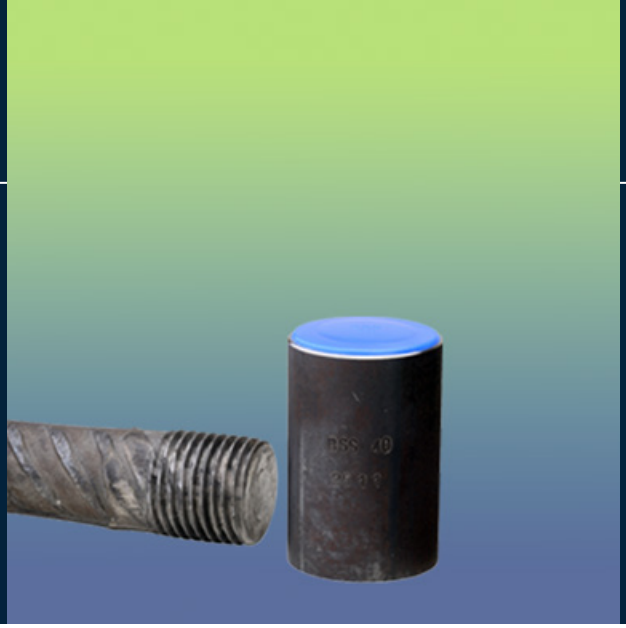
a) TA1-F: Eurocode 2 for static applications in tension only with SS560 Grade B500B reinforcement.

b) ISO15835-1:2018 Steels for the reinforcement of concrete - Reinforcement couplers for mechanical splices of bars - requirements under predominantly static loads in tension only using SS560 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. The coupler as detailed in table 1 has been designed with controlled mechanical properties to be compatible with reinforcing bars complying with SS560 Grade B500B.

1.3 Conclusion

It is the opinion of CARES that F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Coupler splicing methods in the size range as detailed in table 1 and 2 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
March 2026

2 Technical Specification

2.1 General

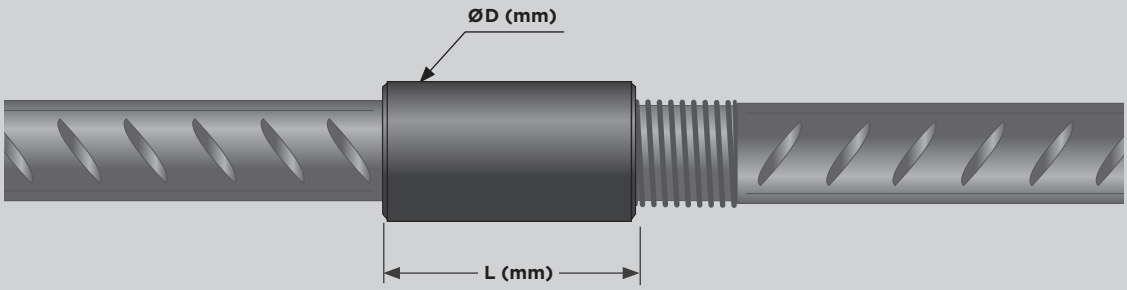
The function of the F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Couplers is to connect deformed steel reinforcing bars complying with SS560 Grade B500B, and thereby create structural continuity of the reinforcing system.

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional 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 F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard Coupler and Splice Method

The F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard Coupler splicing method is designed for use where one of the bars to be spliced can be rotated. It comprises a steel sleeve with an internal parallel thread, the rebar is upset and then a matching external parallel thread is applied to each rebar, equating to half of the length of each coupler.

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard Coupler and splice method arrangement



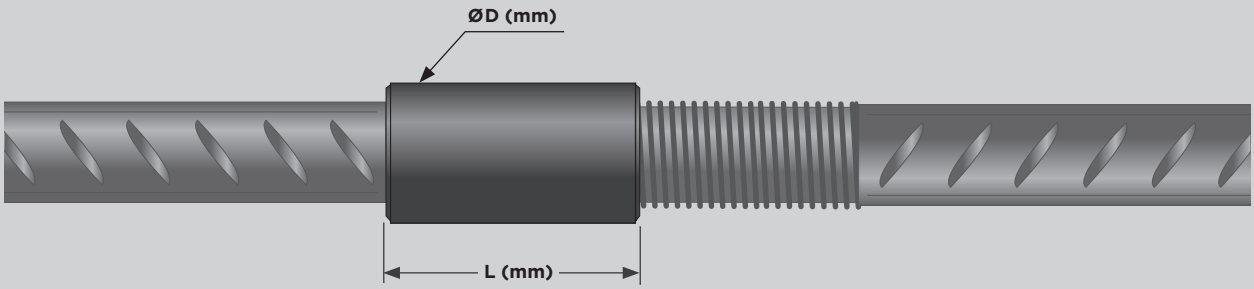
Description	Bar Size	ØD mm	L mm	Thread Size mm	Thread Length Each Coupler mm	Reinforcement Grade	Installation Torque Nm
BSS 13 - M16	13	22	26	M16 x 2	13	B500B / SS560	70
BSS 16 - M20	16	26	40	M20 x 2.5	20	B500B / SS560	90
BSS 20 - M24	20	32	48	M24 x 3	24	B500B / SS560	100
BSS 25 - M30	25	40	60	M30 x 3.5	30	B500B / SS560	140
BSS 28 - M33	28	44	66	M33 x 3.5	33	B500B / SS560	160
BSS 32 – M36	32	48	72	M36 x 4	36	B500B / SS560	170
BSS 40 - M45	40	60	90	M45 x 4.5	45	B500B / SS560	200

Table 1

2.3 F-Tive BSS Upset Forged Rebar Parallel Threaded Type B Positional Coupler and Splice Method

The F-Tive BSS Upset Forged Rebar Parallel Threaded Type B Positional Coupler splicing method is designed to join reinforcing bars where both bars are not allowed to rotate. The coupler is the same type as detailed in tables 1 & 2 but one rebar has a double length thread to allow for the connection of the bars, as detailed in the installation instructions following.

F-Tive BSS Upset Forged Rebar Parallel Threaded Type Positional B Coupler and splice method arrangement



Description	Bar Size	ØD mm	L mm	Thread Size mm	Thread Length Each Coupler mm	Reinforcement Grade	Installation Torque Nm
BSS 13 - M16	13	22	26	M16 x 2	13/26	B500B / SS560	70
BSS 16 - M20	16	26	40	M20 x 2.5	20/40	B500B / SS560	90
BSS 20 - M24	20	32	48	M24 x 3	24/48	B500B / SS560	100
BSS 25 - M30	25	40	60	M30 x 3.5	30/60	B500B / SS560	140
BSS 28 - M33	28	44	66	M33 x 3.5	33/66	B500B / SS560	160
BSS 32 – M36	32	48	72	M36 x 4	36/72	B500B / SS560	170
BSS 40 - M45	40	60	90	M45 x 4.5	45/90	B500B / SS560	200

Table 2

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 when used with reinforcing steel SS560 grade B500B.

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 SS560 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

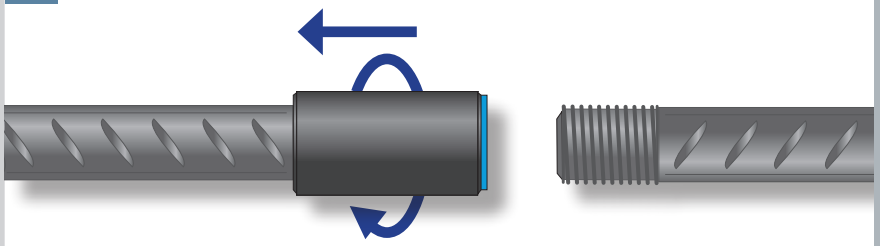
Tests verify compliance with Clauses 5.3 and 5.4 of ISO15835-1:2018 for the following for a category “B” coupler as defined in table 2 of ISO15835-1:

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

4 Installation

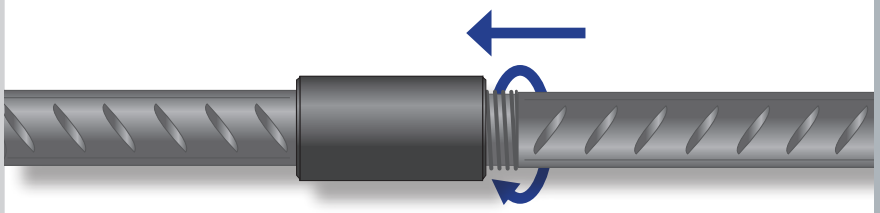
4.1 F-Tive BSS Upset Forged Rebar Type A Standard Coupler Splice Method

1



Rotate the coupler to the rear of the thread on the fixed bar.

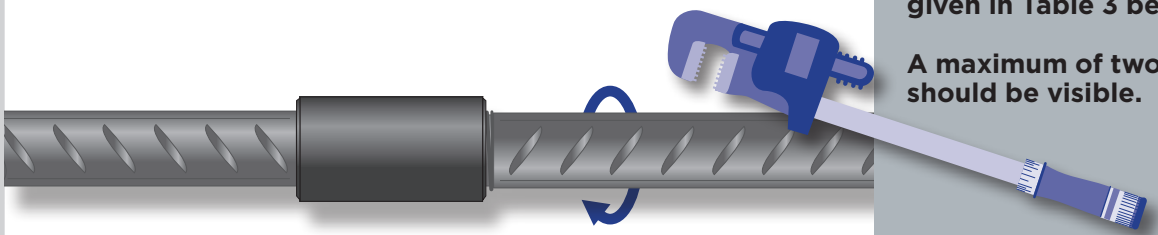
2



Remove the plastic cap from the coupler.

Position and rotate the continuation bar in the coupler.

3



Tighten the joint using a torque wrench on the continuation bar using the specified torque values given in Table 3 below.

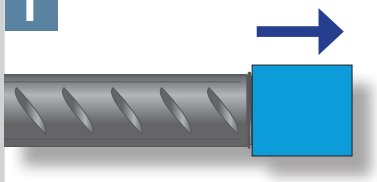
A maximum of two threads should be visible.

Reinforcement diameter [mm]	13	16	20	25	28	32	40
Torque [Nm]	70	90	100	140	160	170	200

Table 3

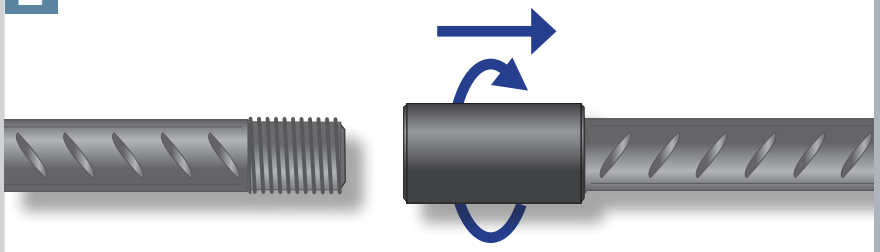
4.2 F-Tive BSS Upset Forged Rebar Positional Type B Coupler Splice Method

1



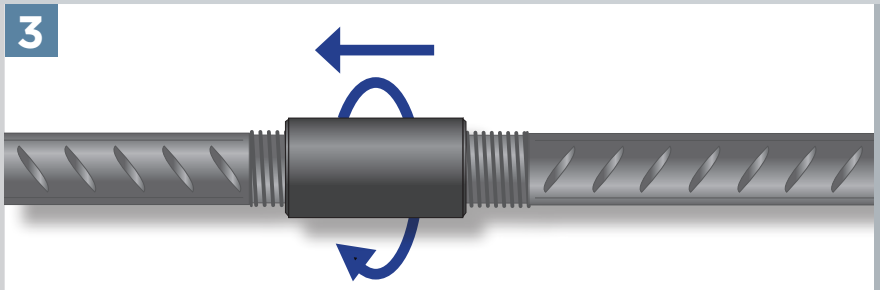
Remove the threaded end cap from the bar.

2



Screw the coupler to the rear of the thread on the continuation bar.

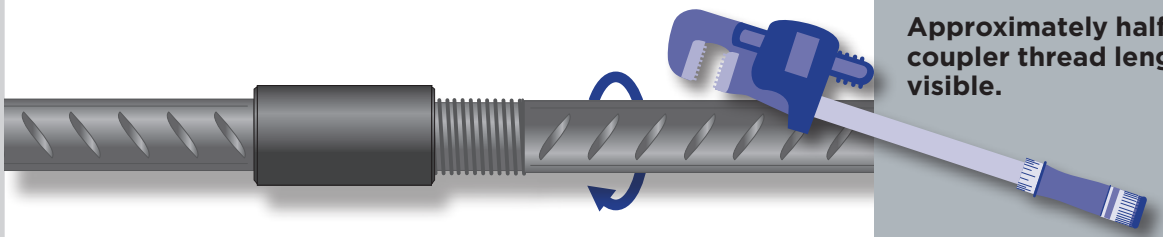
3



Position the continuation bar with the coupler against the end of the first bar.

Screw the coupler from the continuation bar to engage against the rear of the thread on the other bar.

4



Tighten the joint using a torque wrench on the continuation bar to lock the two bar ends against each other within the coupler using the specified torque values given in Table 4 below.

Approximately half of coupler thread length visible.

Reinforcement diameter [mm]	13	16	20	25	28	32	40
Torque [Nm]	70	90	100	140	160	170	200

Table 4

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

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Couplers have been tested to satisfy the requirements of CARES Appendix TA1-F for Couplers with reinforcing bars to SS560 Grade B500B.

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

F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional 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 BSS 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 F-Tive BSS Upset Forged Rebar Parallel Threaded Type A Standard and Type B Positional Couplers to reinforcing steel comply with the material requirements of EC2.

9 References

- SS 560:2016+A1:2024 Specification for steel for the reinforcement of concrete – Weldable reinforcing steel – Bar, coil and decoiled product.
- 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 F-TIVE Splicing 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 5104. Confirmation that this technical approval is current can be obtained from CARES.

CARES
Pembroke House
21 Pembroke Road
Sevenoaks
Kent TN13 1XR

Phone: +44(0)1732 450000
E-mail: general@carescertification.com
www.carescertification.com

Independent Product Assessments for the Construction Industry

18.3.26