

CARES Technical Approval Report TA1-B 5025

Assessment of the Spliceman
Barbreak Coupler Product and the
Quality System for Production

G.Tech Splicing ***Spliceman Barbreak Couplers***



Product

*G.Tech Spliceman
Barbreak couplers
for reinforcing steel.*

Produced by:

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1 Product Summary

G.Tech Spliceman Barbreak couplers in the size range 12mm - 32mm are for the mechanical connection of deformed high yield carbon steel bars for the reinforcement of concrete complying with the requirements of BS4449 Grade B500C.

1.1 Scope of Application

G.Tech Spliceman Barbreak couplers in the size range 12mm - 32mm have been evaluated for use as follows:

- 12mm to 32mm Zap Spliceman Barbreak couplers for static BS8110 applications in tension only 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.

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 BS4449 Grade B500C.

1.3 Conclusion

It is the opinion of CARES that G.Tech Spliceman Barbreak couplers in the size range 12mm - 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.



B. Bowsher
Executive Director

February 2009

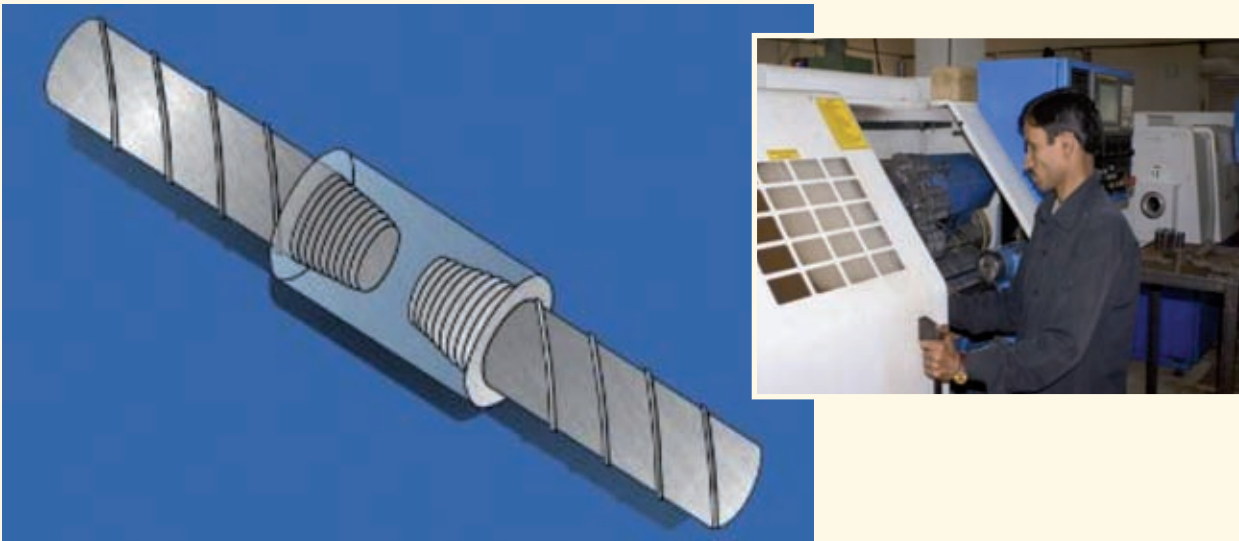


2 Technical Specification

2.1 General

The function of Spliceman Barbreak mechanical couplers is to positively connect deformed steel reinforcing bars complying with BS 4449 Grade B500C and thereby create structural continuity of the reinforcing system.

2.2 Spliceman Barbreak couplers



Spliceman Barbreaker couplers are used to mechanically splice the rebars. They are designed to withstand breaking strength of 700 N/mm^2 well above the breaking strength of most reinforcement bars.

The Spliceman Barbreaker couplers are self locking tapered threaded couplers which do not require lock nut as in case of parallel threading couplers. Also off setting or forging of rebars is not required for threading the rebars.

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 bars to BS4449 Grade B500C:

CARES APPENDIX TA1-B tensile strength requirements

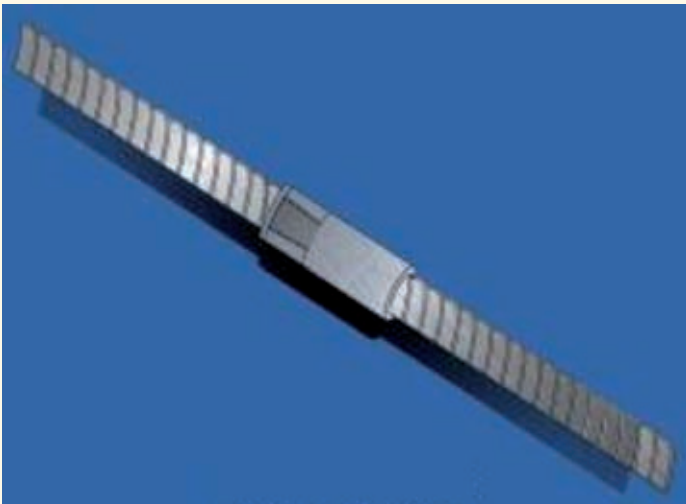
- Permanent deformation is less than 0.1mm after loading to $0.6f_y$ in tension with grade B500C reinforcement.
- 99% characteristic tensile strength is greater than 575 MPa with grade B500C reinforcement.

4 Installation

Reinforcement steel bars are square cut at steel bar yard by mechanical cutter as per the required size and then shifted onto the work stations where the rebar is threaded.

The threading of re-bars should be carried out by trained threading operators. After the bars are threaded, protective caps would have to be installed on the threaded ends to avoid damage of the threads. Couplers should be installed on one end of the rebar and the other end should be capped. Bars should be shifted to the bending yard only after the threading operations. All the threaded bars should be stacked properly size wise and diameter wise.

The reinforcement bar yard engineer shall check thread length and configuration after every 100 threading intervals with a coupler gauge, which is specially dissected to show inner threads and configuration and record the same.



Coupler Gauge

- 1 Ensure couplers used are of correct size. Always keep inner threads of couplers clean and free from grease.
- 2 Screw couplers onto threaded bar by hand (Roughly 6 Turns). Complete tightening by using pipe wrench to achieve full tightening of joints. The minimum Torque value is given on **Table 1**.
- 3 Remove plastic screw cap from the other end of coupler and lower self-aligning bar into coupler and tighten the bar as per step 2.



The site engineer / quality engineer / installation inspector should first visually check if any threads are exposed. If exposed threads are visually detected, then immediately those joints would be verified that the same are not loose and are tightened. The site engineer shall also check the joints as tightened by contractor with a torque wrench at every 100 joint intervals.

Table 1 shows the required torque for each reinforcement bar size. During the check, if any joint is found loose, then all the remaining joints will be checked as given below. All the coupled bars as checked by site engineer and verified by QA/QC should be recorded in the coupler tightening record book.



Size (mm)	12	16	20	25	28	32	36
Torque (Kg.-cm)	900	900	900	1800	1800	1800	1800

Table 1

5 Safety Considerations

Pre-work briefing is given to all workers engaged in the factory. All persons engaged in cutting and threading work will be provided with and wear safety helmet,

safety foot wear and other protective aids as required at all times. Due care should be taken while handling the coupler boxes which are packed in approx. 24 kg. boxes.

6 Product Testing and Evaluation

Spliceman Barbreak couplers have been tested to satisfy the requirements of CARES Appendix TA1-B for Couplers with reinforcing bars to BS4449 Grade B500C. The testing comprised the following elements:

- Tensile Strength
- Permanent Deformation

The products are subject to a programme of periodic testing to ensure that they remain within the performance limits of this technical approval.

7 Quality Assurance

Spliceman Barbreak couplers are produced under an ISO9001 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.

8 Building Regulations

8.1 The Building Regulations (England and Wales)

Structure, Approved Document A

Spliceman Barbreak couplers, when used in BS8110 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, to support regulation 7

This technical approval gives assurance that the Spliceman Barbreak couplers comply with the material requirements of BS8110.

8.2 The Building Regulations (Northern Ireland)

Part B, Materials and Workmanship

This technical approval gives assurance that Spliceman Barbreak couplers comply with the material requirements of BS8110 by virtue of regulation *B3, Deemed to satisfy provisions regarding the fitness of materials and workmanship.*

8.3 The Building Standards (Scotland) Regulations

Part B, Fitness of Materials

This technical approval gives assurance that Spliceman Barbreak couplers comply with the material requirements of BS8110 by virtue of *Clause B2.1*

Part C, Structure

Spliceman Barbreak couplers, when used in BS8110 based designs using the data contained within this technical approval, satisfy the requirements of *The Building Standards (Scotland) Regulations, Part C, C2.1 clause b. construction,ii.*



9 References

- BS 4449: 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 ISO 9001: 2000: Quality management systems - Requirements.
- CARES Appendix TA1-B; Quality and Operations Schedule for the Technical Approval of Couplers for Reinforcing Steel For BS8110 Applications for Static Tension or Static 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 is unchanged.
 - b. The materials and method of manufacture 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 G.Tech 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 5025. Confirmation that this technical approval is current can be obtained from UK CARES.



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