

# ICC-ES Evaluation Report

**ESR-1705**

Reissued July 2019

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**DIVISION: 03 00 00—CONCRETE**  
**Section: 03 21 00—Reinforcing Steel**

**REPORT HOLDER:**

DEXTRA MANUFACTURING CO., LTD.

**EVALUATION SUBJECT:**

**BARTEC® MECHANICAL SPLICE SYSTEM FOR  
CONNECTING STEEL REINFORCING BARS IN  
CONCRETE**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-1705 LABC Supplement](#).

**Property evaluated:**

Structural

**2.0 USES**

The Bartec mechanical splice system is used as tension and compression mechanical splices of deformed steel reinforcing bars in reinforced concrete construction. The splice system complies with Section 25.5.7.1 of ACI 318-14 for the 2018 and 2015 IBC, and Section 12.14.3.2 of ACI 318 (-11 and -08) for the 2012 and 2009 IBC, respectively, as ACI 318 is referenced in IBC Section 1901.2. The mechanical splice system also complies with the mechanical splice requirements of Section 18.2.7.1 of ACI 318-14 for the 2018 and 2015 IBC, and Section 21.1.6.1 of ACI 318 (-11 and -08) for the 2012 and 2009 IBC, respectively, for use where Type 1 or Type 2 mechanical splices are specified by the IBC and ACI 318.

**3.0 DESCRIPTION**

**3.1 General:**

The Bartec mechanical splice system consists of the Bartec coupler, or Bartec Form Fixer coupler, and Bartec deformed steel reinforcing bars. The ends of the reinforcing bars are cold-formed and threaded with metric threads to mate with the internal threads of the coupler.

The Bartec coupler is for use as either a standard splice or a position splice. The difference between the two splice systems is the manner of installation and the length of the threads on one of the two threaded steel reinforcing bar ends. The threaded length on one of the steel reinforcing bars in a position splice is longer than the length of the threads on the second reinforcing bar. The Bartec coupler is available for splicing Nos. 4, 5, 6, 7, 8, 9, 10, 11, 14 and 18 steel reinforcing bars. See Figure 1 and Table 1.

The Bartec Form Fixer coupler consists of the Bartec coupler with a steel flange factory-attached to one end of the coupler. The Bartec Form Fixer couplers are available for splicing Nos. 4, 5, 6, 7, 8, 9, 10 and 11 steel reinforcing bars. See Table 1 and Figure 2.

**3.2 Materials:**

**3.2.1 Couplers:** The couplers are manufactured from steel complying with SAE J403-2001 grade 1045, with minimum specified yield and tensile strengths of 58 and 87 ksi (400 and 600 MPa), respectively.

**3.2.2 Steel Reinforcing Bars:** The deformed steel reinforcing bars comply with ASTM A615, Grade 60, or ASTM A706 Grade 60. Galvanization and epoxy coatings, if applied to the reinforcing bars, must comply with ASTM A767 or ASTM A775, respectively, and be applied prior to cold forming of the reinforcing bar ends. The forging and threading operations remove the zinc or epoxy coating near the bar ends.

**4.0 INSTALLATION**

**4.1 General:**

**4.1.1 Standard Splice:** The Bartec coupler must be threaded onto the end of one reinforcing bar, without tools, to an approximate depth equal to half the coupler length. The depth of thread engagement is limited by the threads on the reinforcing bar and is one-half the coupler length. The second reinforcing bar must be threaded into the opposite end of the coupler and the splice tightened with a wrench applied to the second reinforcing bar. The final installation of the coupler shall have not more than one bar end thread emerging from both ends of the coupler.

**4.1.2 Position Splice:** The coupler is fully threaded onto the reinforcing bar having the forged end with the longer length of threads. The end of the second reinforcing bar is butted to the end of the first bar, and the coupler is then reverse-threaded onto the second bar. The splice must be tightened with a wrench applied to the bar. The final installation of the coupler shall have not more than one full bar end thread emerging from the ends of the coupler.

(a full thread is a thread that is continuous around the circumference of the bar).

**4.1.3 Bartec Form Fixer Couplers:** The coupler must be threaded onto one reinforcing bar as described for a Bartec coupler in a standard splice in Section 4.1.1. The flange of the coupler can be nailed to the wooden formwork for the concrete. The second reinforcing bar is threaded into the opposite end of the coupler as described in Section 4.1.1, after removal of the formwork.

#### 4.2 Special Inspection:

Special inspection is required in accordance with Section 1705 of the 2018, 2015 and 2012 IBC, and Section 1704 of the 2009 IBC, as applicable. In addition to verifying placement of reinforcing bar splices in accordance with this report, the special inspector must verify reinforcing bar embedment; coupler and rebar identification; field preparation of components, including field preparation of reinforcing bar ends; and assembly of the components resulting in spliced reinforcing bars.

#### 5.0 CONDITIONS OF USE

The Bartec mechanical splice system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The splice system must be installed in accordance with the applicable code, the manufacturer's instructions and this report. In the case of conflict between the manufacturer's published instructions and this report, this report governs.
- 5.2 Splice locations must comply with applicable code requirements and be noted on plans approved by the code official.
- 5.3 Under the 2018 and 2015 IBC, as applicable, for structures regulated by Chapter 18 of ACI 318-14 (as required by 2018 and 2015 IBC Section 1905.1, as applicable), to splice deformed longitudinal reinforcing bars resisting earthquake-induced moment, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the mechanical splice systems, mill certificates of reinforcing bars must be submitted to the code official as evidence that the steel reinforcing bars comply with ACI 318-14 Section 20.2.2.5.
- 5.4 Under the 2012 IBC, for structures regulated by Chapter 21 of ACI 318-11 (as required by 2012 IBC Section 1905.1), to splice deformed reinforcing bars resisting earthquake-induced flexure, axial force, or both, in special moment frames, special structural walls, and all components of special structural walls including coupling beams and wall piers, with the Bartec mechanical splice system, mill certificates of

reinforcing bars must be submitted to the code official as evidence that the steel reinforcing bars comply with ACI 318-11 Section 21.1.5.2.

- 5.5 Under the 2009 IBC, for structures regulated by Chapter 21 of ACI 318-08 (as required by 2009 IBC Section 1908.1), to splice deformed reinforcing bars resisting earthquake-induced flexure and axial forces in frame members, structural walls and coupling beams, with the Bartec mechanical splice system, mill certificates of reinforcing bars must be submitted to the code official as evidence that the steel reinforcing bars comply with ACI 318-08 Section 21.1.5.2.
- 5.6 Special inspection must be provided in accordance with Section 4.2 of this report.
- 5.7 Minimum concrete cover must be in accordance with the IBC and must be measured to the outer surface of the coupler.

#### 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Connector Systems for Steel Reinforcing Bars (AC133), dated October 2015 (editorially revised May 2018).

#### 7.0 IDENTIFICATION

- 7.1 Each coupler is stamped with the letter "B" that designates the Bartec product name, the required rebar size, a work order number, and "T2" to designate the use of the coupler in a Type 2 splice. The packaging for the coupler has a label bearing the company name and address of Dextra Manufacturing Co., Ltd., and the coupler model number, in addition to a sticker with the word "Bartec" and the evaluation report number (ESR-1705). Bundles of cold-formed and threaded steel reinforcing bars, both with and without couplers temporarily threaded onto the ends of the steel reinforcing bars, are labeled with a tag bearing the Dextra Manufacturing company name, product designation (Bartec), the Type 2 splice designation, the rebar size and the evaluation report number (ESR-1705).
- 7.2 The report holder's contact information is the following:

**DEXTRA MANUFACTURING CO., LTD.**  
**5<sup>th</sup> FLOOR LUMPINI II BUILDING**  
**247 SARASIN ROAD**  
**LUMPINI, PATHUMWAN, BANGKOK 10330**  
**THAILAND**  
[www.dextragroup.com](http://www.dextragroup.com)  
[jjbraun@dextragroup.com](mailto:jjbraun@dextragroup.com)

TABLE 1—BARTEC COUPLER (STANDARD, POSITION AND FORM FIXER)<sup>1</sup>

| REBAR NOMINAL SIZE | MODEL | L (in)                        | D (in)                        | M <sup>2</sup> (mm) | A (in)                        | B (in)                         |
|--------------------|-------|-------------------------------|-------------------------------|---------------------|-------------------------------|--------------------------------|
| #4                 | B#4   | 1 <sup>3</sup> / <sub>8</sub> | 7/ <sub>8</sub>               | M16 × 2.0           | 2 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>16</sub> |
| #5                 | B#5   | 1 <sup>3</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>8</sub> | M20 × 2.5           | 2 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>16</sub> |
| #6                 | B#6   | 2 <sup>1</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>4</sub> | M24 × 3.0           | 2 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>16</sub> |
| #7                 | B#7   | 2 <sup>3</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>2</sub> | M27 × 3.0           | 2 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>16</sub> |
| #8                 | B#8   | 2 <sup>3</sup> / <sub>4</sub> | 1 <sup>5</sup> / <sub>8</sub> | M30 × 3.5           | 2 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>16</sub> |
| #9                 | B#9   | 2 <sup>7</sup> / <sub>8</sub> | 1 <sup>3</sup> / <sub>4</sub> | M33 × 3.5           | 3                             | 4 <sup>3</sup> / <sub>8</sub>  |
| #10                | B#10  | 3 <sup>1</sup> / <sub>8</sub> | 2                             | M36 × 3.0           | 3                             | 4 <sup>3</sup> / <sub>8</sub>  |
| #11                | B#11  | 3 <sup>3</sup> / <sub>8</sub> | 2 <sup>1</sup> / <sub>4</sub> | M39 × 4.0           | 3                             | 4 <sup>3</sup> / <sub>8</sub>  |
| #14                | B#14  | 4 <sup>1</sup> / <sub>8</sub> | 2 <sup>3</sup> / <sub>4</sub> | M48 × 4.0           | NA <sup>3</sup>               | NA <sup>3</sup>                |
| #18                | B#18  | 5 <sup>1</sup> / <sub>8</sub> | 3 <sup>3</sup> / <sub>8</sub> | M60 × 4.0           | NA <sup>3</sup>               | NA <sup>3</sup>                |

For SI: 1 inch = 25.4 mm.

<sup>1</sup>Coupler dimensions in this table and shown in Figures 1 and 2 are nominal dimensions for detailing.

<sup>2</sup>The dimensions of "M" include the nominal thread diameter and the thread spacing.

<sup>3</sup>NA signifies that the Form Fixer couplers are not available in the noted size.

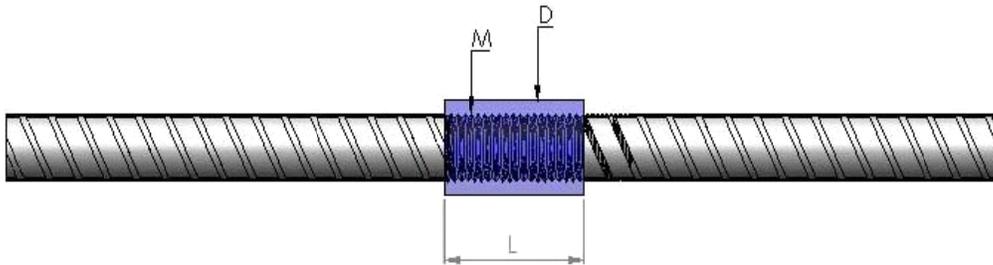


FIGURE 1—INSTALLED BARTEC COUPLER (STANDARD AND POSITION)

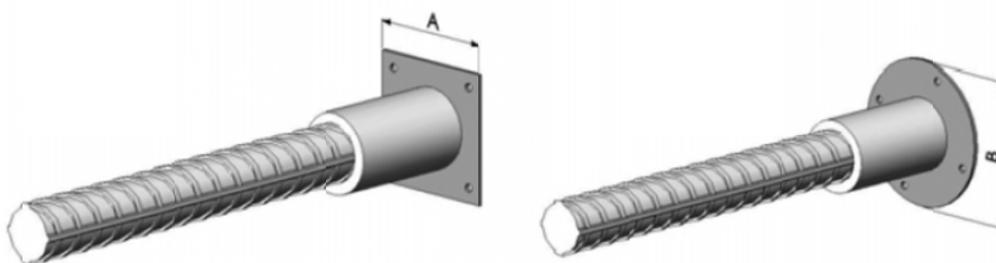


FIGURE 2—TYPICAL FORM FIXER COUPLERS

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## ESR-1705 LABC Supplement

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### EVALUATION SUBJECT:

**BARTEC® MECHANICAL SPLICE SYSTEM FOR CONNECTING STEEL REINFORCING BARS IN CONCRETE**

### 1.0 REPORT PURPOSE AND SCOPE

#### Purpose:

The purpose of this evaluation report supplement is to indicate that the Bartec® Mechanical Splice System for Connecting Steel Reinforcing Bars in Concrete, described in ICC-ES master evaluation report [ESR-1705](#), has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

#### Applicable code editions:

- 2017 *City of Los Angeles Building Code* (LABC)

### 2.0 CONCLUSIONS

The Bartec® Mechanical Splice System for Connecting Steel Reinforcing Bars in Concrete, described in Sections 2.0 through 7.0 of the master evaluation report [ESR-1705](#), complies with the LABC Chapter 19, and is subjected to the conditions of use described in this supplement.

### 3.0 CONDITIONS OF USE

The Bartec® Mechanical Splice System for Connecting Steel Reinforcing Bars in Concrete described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report [ESR-1705](#).
- The design, installation, conditions of use and identification are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the master evaluation report [ESR-1705](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Continuous special inspection by Deputy Inspectors shall be provided during installation of splices.

This supplement expires concurrently with the master report, reissued July 2019.