



- Compliance with International Codes
- Compliance to State/Regional Codes

# ICC-ES Evaluation Report

## ESR-3679

Issued October 2022

This report is subject to renewal October 2023.

**DIVISION: 03 00 00—CONCRETE**  
**Section: 03 21 00—Reinforcement Bars**

**REPORT HOLDER:**

**BARTEC COMPANY (SUBSIDIARY OF BARTEC GROUP)**

**EVALUATION SUBJECT:**

**LINXION COUPLER PI**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2021, 2018 and 2015 *International Building Code*® (IBC).
- 2021, 2018 and 2015 *International Residential Code*® (IRC).

**Property evaluated:**

Structural

**2.0 USES**

The Linxion Coupler PI rebar splicing is used as tension and compression mechanical splices of deformed steel reinforcing bars in reinforced concrete construction.

The Linxion Coupler PI rebar splicing installed in concrete comply with Section 25.5.7.1 of ACI 318-19 for the 2021 IBC, or ACI 318-14 for the 2018 and 2015 IBC, as referenced in Section 1901.2 of the IBC.

The system, when used to splice ASTM A615 Grade 60 bars sizes No. 6, 8 and 11, complies with the Type 1 and Type 2 mechanical splice requirements of Section 18.2.7.1 of ACI 318-19 (2021 IBC), and ACI 318-14 (2018 and 2015 IBC), for concrete applications.

The Linxion Coupler PI rebar splicing can also be used where an engineering design is submitted in accordance with IRC Section R301.1.3 and where approved by the building official in accordance with IRC Section R104.11.

**3.0 DESCRIPTION**

**3.1 General:**

The Linxion Coupler PI rebar splicing consists of various components that are assembled together to form a completed splice. Each splice consists of the following components: two equal size reinforcing bars, and a

proprietary steel coupling sleeve with internal threads. Dimensions for this splice system are shown in Figure 1 and Table 1.

**3.2 Materials:**

**3.2.1 Couplers:** The couplers are manufactured from high carbon steel and comply with the descriptions and product material specifications in the approved Bartec Company quality documentation. Internal threads comply with ISO 724, ISO 965/1 and 965/3, ISO 1502 standards with tolerance class 6H.

**3.2.2 Steel Reinforcing Bars:** The deformed steel reinforcing bars comply with ASTM A615, Grade 60. The reinforcing bars must have headed ends complying with this report and the specification provided by Bartec Company.

**4.0 INSTALLATION**

**4.1 Linxion Coupler PI Rebar Splicing:**

One end of each reinforcing bar is cold forged and threaded with BARTEC Group machines technology. Final assembly of the splice takes place in the field by Bartec Company trained customer's team following Bartec Company requirements. The assembly process must be as described in the steps below:

Step 1: The 1<sup>st</sup> phase rebar threaded end is fully engaged inside the coupler and the plastic plug is correctly installed.

Step 2: After concreting, remove the plastic plug from the coupler.

Step 3: Remove the plastic protection from the 2<sup>nd</sup> phase rebar.

Step 4: Rotate the 2<sup>nd</sup> phase rebar into the coupler up to the other threaded end of the 1<sup>st</sup> phase rebar.

Step 5: Use a normal wrench to tighten the rebar. For No. 8 (ø25) and above bar sizes, use a wrench with a handle at least 31½-inch (0.8 m) long.

Step 6: When installation is complete, check no threaded portion of the rebar is visible outside the coupler.

**4.2 Special Inspection:**

Special inspection is required in accordance with Section 1705 of the IBC. In addition to verifying placement of reinforcing bar splices in accordance with this report, the special inspector must verify reinforcing bar embedment,

grade and size; coupler and rebar identification; field preparation of components, including field preparation of reinforcing bar ends; position of coupler, and assembly of the components resulting in spliced reinforcing bars.

## 5.0 CONDITIONS OF USE

The Linxion Coupler PI rebar splicing described in this report comply with, or is a suitable alternative to, what is specified in the 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 The location of splices installed in concrete must comply with applicable ACI 318 requirements, as modified by the IBC, and be noted on plans approved by the code official.
- 5.3 Under the 2021, 2018 and 2015 IBC, as applicable, for structures regulated by Chapter 18 of ACI 318-19 and 318-14 (as required by 2021, 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 Linxion Coupler PI rebar splicing, mill certificates of reinforcing bars must be submitted to the code official as evidence that the steel reinforcing bars comply with ACI 318-19 and 318-14 Section 20.2.2.5.
- 5.4 For splice systems consisting of steel reinforcing bars with specially prepared ends, where the steel reinforcing bars are prepared at the jobsite, the following applies:
  - 5.4.1 The jobsite fabricator must be approved by the evaluation report holder. The jobsite fabricator must demonstrate the following items to the satisfaction of the special inspector for each splice system model type and steel reinforcing bar size:
    - (i) The fabricator prepares the ends of the steel reinforcing bar as required by the evaluation report holder in a manner consistent with the qualifying test specimens and Bartec Instructions. According to the BARTEC process, rebar is cut, then there is cold forging process to improve the mechanical characteristics of the rebar. And finally, the threading process complete the process.
    - (ii) For Type 2 splices, splices of each steel reinforcing bar using the fabricator-prepared steel reinforcing bars, tested in static tension, develop 100 percent of the specified tensile strength of the steel reinforcing bar and 125 percent of the specified yield strength of the reinforcing bar for use under the IBC or IRC. This may be demonstrated in test reports submitted to the code official. These tests should be conducted prior to commencement, and periodically throughout the duration, of the jobsite preparation of the ends of the steel reinforcing bars. The frequency of the tensile tests shall be acceptable to the registered design professional for the building project, and to the applicable code official.

- (iii) For Type 1 splices, splices of each steel reinforcing bar using the fabricator-prepared steel reinforcing bars, tested in static tension, develop 125 percent of the specified yield strength of the steel reinforcing bar. This may be demonstrated in test report(s) submitted to the code official. These tests shall be conducted prior to commencement, and periodically throughout the duration, of the jobsite preparation of the ends of the steel reinforcing bars. The frequency of the tensile tests shall be acceptable to the registered design professional for the building project, and to the applicable code official

- 5.5 For splice systems consisting of steel reinforcing bars with specially prepared ends supplied by fabricators' facilities not identified in the evaluation report, the following statements applies:
  - 5.5.1 The fabricator must be a fabricator approved by the code official in accordance with Section 1704.2.5.1 of the IBC. The fabricator must also be approved by the evaluation report holder. The fabricator must demonstrate the following items to the satisfaction of the code official for each splice system model type and steel reinforcing bar size:
    - (i) The fabricator prepares the ends of the steel reinforcing bar as required by the evaluation report holder in a manner consistent with the qualifying test specimens and Bartec Instructions. According to the BARTEC process, rebar is cut, then there is cold forging process to improve the mechanical characteristics of the rebar. And finally, the threading process complete the process.
    - (ii) For Type 2 splices, splices of each steel reinforcing bar using the fabricator-prepared steel reinforcing bars, tested in static tension, develop 100 percent of the specified tensile strength of the steel reinforcing bar and 125 percent of the specified yield strength of the reinforcing bar for use under the IBC and IRC. This may be demonstrated in test reports submitted to the code official.
    - (iii) For Type 1 splices, splices of each steel reinforcing bar using fabricator-prepared steel reinforcing bars, tested in static tension, develop at least 125 percent of the specified yield strength of the steel reinforcing bars. This may be demonstrated in test reports submitted to the code official.

- 5.6 Special inspection must be provided in accordance with Section 4.2 of this report.
- 5.7 For splice systems installed in concrete, the minimum concrete cover and spacing between spliced bars must be in accordance with the ACI 318 requirements, as modified by the IBC when applicable, and must be measured from the outer surface of the coupler.
- 5.8 The evaluation of corrosion resistance of the mechanical splice is outside the scope of this evaluation and must be considered by the registered design professional performing the design.
- 5.9 The splice system components are fabricated under a quality control system with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Mechanical Splice Systems for Steel Reinforcing Bars (AC133), dated October 2020 (editorially revised on August 2022).

**7.0 IDENTIFICATION**

7.1 Each bundle of reinforcing bar/couple assemblies must be identified with a label showing the company name Bartec Company, and the ICC-ES evaluation report number (ESR-3679). Each coupler is marked with the cast number.

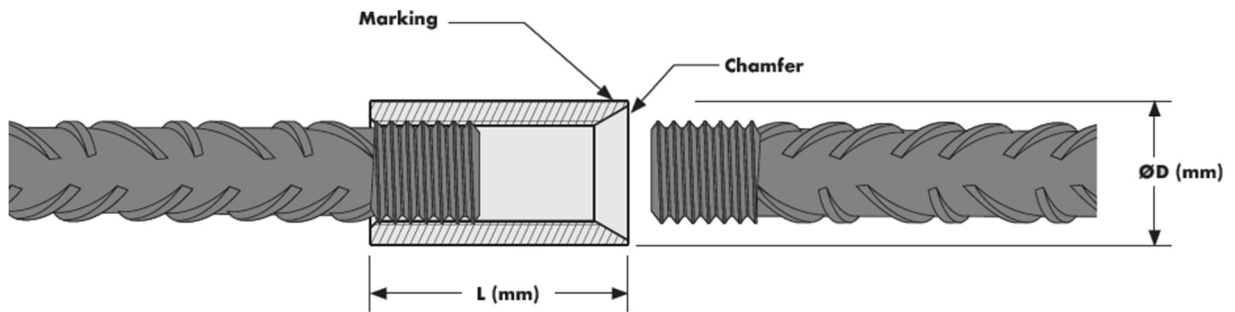
7.2 The report holder’s contact information is the following:

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**TABLE 1—COUPLER DIMENSIONS**

Coupler Reference	Bar Size Designation	Couplers Dimensions <sup>1</sup>		
		Outside Ø in inch	Length In inch	Weight, lbs. (kg)
PI19 #6	No. 6	1 3/16 (1.188)	1 31/32 (1.968)	0.31 (0.14)
PI25/26 #8	No. 8	1 9/16 (1.562)	2 31/32 (2.969)	0.73 (0.33)
PI36 #11	No. 11	2 5/32 (2.156)	3 19/32 (3.594)	1.90 (0.86)

<sup>1</sup>For SI conversion, 1 inch = 25.4 mm



**FIGURE 1—LINXION COUPLER PI DIMENSIONS**