



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

Product Certification System:

The ICC-ES product-certification system includes evaluating reports of test of standard manufactured product, prepared by accredited testing laboratories and provided by the listee to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the listee's quality system.

Product: HRC 500/510 XTENDER® AND HRC 300 SERIES FORM PROTECTOR MECHANICAL COUPLER SYSTEMS

Listee: HEADED REINFORCEMENT CORP.

Evaluation: The HRC 500/510 Xtender® Mechanical Coupler and the HRC 300 Series Form Protector mechanical splice systems for deformed steel reinforcing bars, used in the design and construction of structural concrete members, were evaluated based on testing in accordance to the following standards:

- ASTM A370, Test Methods and Definitions for Mechanical Testing of Steel Products, ASTM International.
- CSA A23.3 (-19 and -14), Design of concrete structures, CSA Group.

Findings: The HRC 500/510 Xtender® Mechanical Coupler and the HRC 300 Series Form Protector mechanical splice systems develop the design yield strength (400 MPa to 500 MPa) and tensile strength (540 MPa to 675 MPa), as applicable, in accordance with CSA A23.3 Sections 12.14.3.4 and 21.2.7.3.1, as referenced in the applicable section of the following code editions.

- *National Building Code of Canada*® 2020 and 2015
Applicable Section: Volume 1, Division B, Part 4, Section 4.3.3.

Identification:

1. Packaging of the HRC 500/510 Xtender® Mechanical Coupler and the HRC 300 Series Form Protector mechanical splice systems carry a label indicating the manufacturer's name and address, the product name, and the ICC-ES listing report number (ESL-1429) and/or ICC-ES evaluation report number (ESR-2764), and when applicable, the ICC-ES listing mark.
2. The report holder's contact information is the following:

HEADED REINFORCEMENT CORPORATION
11200 CONDOR AVENUE
FOUNTAIN VALLEY, CALIFORNIA 92708
(714) 557-1455
www.hrc-usa.com
engineering@hrc-usa.com

Installation: The systems must be installed in accordance with the Headed Reinforcement Corporation published installation instructions and applicable codes.

Description of products:

The HRC 500/510 Xtender® Mechanical Coupler system consists of an HRC 500 threaded male coupler component, an HRC 510 threaded female coupler component and two steel reinforcing bars that are prepared with headed upset ends. See Table 1 for equivalent sizing for Canadian steel reinforcing bars. See Table 2 and Figure 1 for dimensions and typical assembly.

HRC 500/510 is a positional coupler, allowing pre-bent and pre-tied reinforcing bars to be installed without rotating the reinforcing steel. The coupler is used to mechanically butt-splice No. 4 through No. 11 and No. 14 steel reinforcing bars.

The HRC 300 Series Form Protector system consists of an HRC 300 threaded female coupler component and two steel reinforcing bars that are prepared with HRC 300 threaded ends. See Table 1 for equivalent sizing for Canadian steel reinforcing bars. See Table 3 and Figure 2 for dimensions and a typical assembly.

Conditions of listing:

1. The listing report addresses only conformance with the standards and code sections noted above.
2. Approval of the product's use is the sole responsibility of the local code official.
3. The listing report applies only to the materials tested and as submitted for review by ICC-ES.
4. The HRC 500/510 Xtender® Mechanical Coupler and the HRC 300 Series Form Protector mechanical splice systems are manufactured under a quality control program with inspections by ICC-ES.

TABLE 1—EQUIVALENT BAR SIZE DESIGNATIONS AND AVAILABILITY

HRC 500/510 Reinforcement Bar Size Designation		HRC 300 Reinforcement Bar Size Designation	
U.S. units (ASTM & ACI 318)	Canadian (CSA A23.3)	U.S. units (ASTM & ACI 318)	Canadian (CSA A23.3)
#4	10M	#4	10M
#5	15M	#5	15M
#6	20M	#6	20M
#7	-	#7	-
#8	25M	#8	25M
#10	30M		
#11	35M		
#14	45M		

TABLE 2—DIMENSIONS OF HRC 500/510 COUPLERS

Bar size	#4	#5	#6	#7	#8	#9	#10	#11	#14
A - Coupler OD [in]	1.375	1.500	1.625	1.875	2.125	2.375	2.625	2.875	3.500
B -Typical Length [in]	2.00	2.13	2.38	2.88	3.13	3.50	3.75	4.25	5.13

Bar size	10M	15M	20M	-	25M	-	30M	35M	45M
A - Coupler OD [mm]	34.925	38.100	41.275	-	53.975	-	66.675	73.025	88.900
B -Typical Length [mm]	50.800	54.102	60.452	-	79.502	-	95.250	107.950	130.302

For SI: 1 inch = 25.4 mm, 1 in² = 645 mm².

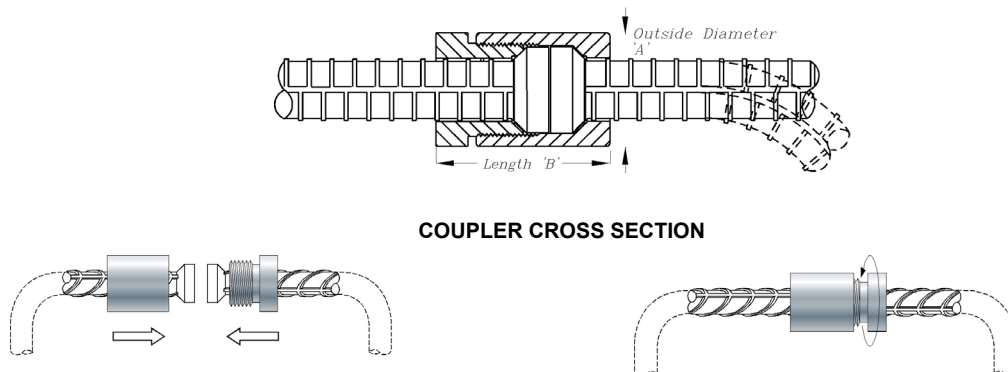


FIGURE 1—500/510 SERIES COUPLERS

TABLE 3—DIMENSIONS OF HRC 300 COUPLERS ^{1,2}

REBAR PROPERTIES			THREAD / COUPLER DIMENSIONS			
BAR SIZE	DIAMETER (INCH)	AREA (IN ²)	THREAD INFORMATION		LENGTH L (INCH)	DIAMETER D (INCH)
			THREAD SIZE UNC	T (INCH)		
#4	0.500	0.20	1/2"-13 UNC	0.75	1.75	0.88
#5	0.625	0.31	5/8"-11 UNC	0.75	2.00	1.00
#6	0.750	0.44	3/4"-10 UNC	1.00	2.13	1.13
#7	0.875	0.60	7/8"-9 UNC	1.00	2.50	1.25
#8	1.000	0.79	1"-8 UNC	1.13	3.00	1.50

REBAR PROPERTIES			THREAD / COUPLER DIMENSIONS			
BAR SIZE	DIAMETER (MM)	AREA (MM ²)	THREAD INFORMATION		LENGTH L (MM)	DIAMETER D (MM)
			THREAD SIZE UNC	T (MM)		
10M	11.3	100	1/2"-13 UNC	19.05	44.45	22.352
15M	16.0	200	5/8"-11 UNC	19.05	50.8	25.4
20M	19.5	300	3/4"-10 UNC	25.4	54.102	28.702
25M	25.2	500	1"-8 UNC	28.702	76.2	38.1

For SI: 1 inch = 25.4 mm, 1 in² = 645 mm²

¹HRC 300 Form Protector Couplers develop the minimum tensile strength of the spliced steel reinforcing bar (400R/400W).

²Hand-tighten to a snug fit. Lubricate threads and use wrench if necessary.

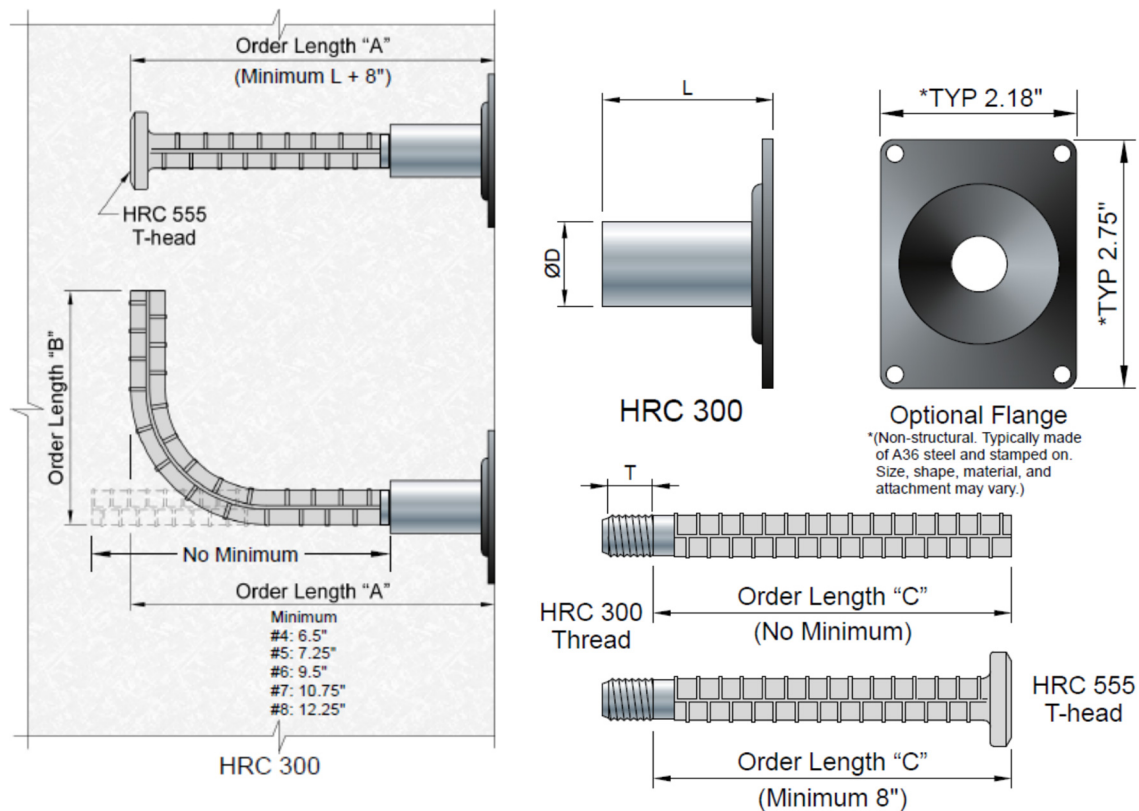


FIGURE 2—HRC 300 SERIES FORM PROTECTOR