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## Safety Notes and Product Application

Dayton Superior strives to ensure that all products supplied from its manufacturing plants meet or exceed the safety requirements inherent in the proper use of its products. However, the performance of a product can be greatly affected by the manner in which the product is used. It is imperative that the user be instructed in the proper installation and use of the products displayed in this handbook prior to job application.

Product production runs are constantly sampled and tested to assure the user a high standard of quality. Samples are tested in Dayton Superior test facilities or at independent testing laboratories. The safe working loads listed in this handbook were determined from the results of the testing program and other industry sources.

Dayton Superior publishes the safe working loads and the associated minimum safety factors of its products and strongly advises that the minimum safety factors not be compromised. When there are unusual job conditions, the minimum safety factors must be increased by the user. Refer to the provisions of the American National Standards Institute (ANSI A 10.9), the Occupational Safety and Health Administration (OSHA) Act, Part 1910, and the American Concrete Institute (ACI) Recommended Practice for Concrete Formwork (ACI 347) and ACI 318 Building Code when considering product safety factors.

## Dayton Superior Technical Services

The Dayton Superior technical departments are well staffed with trained personnel to service inquiries, take-offs and details for the users of Dayton Superior quality splicing accessories.

**Technical Services: 877.266.7732**

## Construction Liquids

### FORM RELEASE AGENTS

- Bio-Release EF
- Clean Strip™ (J-1-A)
- Clean Strip (J-1-A CA)
- Clean Strip (J-1)
- Clean Strip (J-1 Light)
- Clean Strip Citrus (J-1-C)
- Clean Strip Ultra Light (J-3 Light)
- Liner Coat (J-4 LC)

### BOND BREAKERS

- Cure-Lift EF
- Maxi Tilt E
- Sure-Lift WB (J-6 WB)
- Sure-Lift™ (J-6)
- Sure-Lift FD (J-6 FD)
- Super Maxi Tilt

### CURING COMPOUNDS

- Clear Dissipating Cure EF
- Day-Chem City White Cure (J-8)
- Day-Chem Rez Cure (J-11-W)
- Day-Chem White Pigmented Cure - W (J-9-A)
- Day-Chem White Pigmented Cure (J-10-W)
- DSSCC Clear Resin Cure
- DSSCC Resin Cure with Dye
- DSSCC White Resin Cure
- DSSCC White Wax CRD 300
- DSSCC White Wax Cure
- White Dissipating Cure EF

### CURE & SEALS

- Cure & Seal 309 EF
- Cure & Seal 1315 EF
- Day-Chem Cure & Seal™ (J-21 CP)
- Day-Chem Cure & Seal 1315 (J-22 U.V.)
- Day-Chem Cure & Seal U.V. 30% (J-23 U.V.)
- General Purpose Cure & Seal (J-20 U.V.)
- Safe Cure & Seal (J-18)
- Safe Cure & Seal 30% (J-19)

### SEALERS

- Day-Chem Aggre-Gloss™ (J-25)
- Day-Chem Aggre-Gloss OTC (J-25 OTC)
- Day-Chem Aggre-Gloss Non-Gloss (J-25 Non-Gloss)
- Day-Chem Tuf Seal™ (J-35)
- Day-Chem Tuf Seal OTC (J-35 OTC)
- Superior Pro Super Seal
- Ultra Seal 30 EF

### WATER REPELLENTS

- Weather Worker™ WB (J-26-WB)
- Weather Worker WB Heavy Duty (J-27-WB)
- Weather Worker S-40 (J-29)
- Weather Worker S-100 (J-29-A)
- Weather Worker S-100 (J-29-WB)

### LIQUID DENSIFIERS/

- Crete-Cure Concentrate (J-12)
- Day-Chem Sil-Cure™ (J-13)
- Day-Chem Hardener™ (J-15)
- Day-Chem Sure Hard™ (J-17)

### EPOXIES

- Sure-Anchor Epoxy™ (J-50)
- Sure-Anchor I™ (J-51)
- Sure-Anchor All Weather Epoxy (J-51 AW)
- Resi-Bond™ (J-58)
- Resi-Bond (J-58 LPL)
- Sure-Inject (J-56 SLV)
- Sure Level™ Epoxy (J-57)
- Sure Grip Epoxy Grout™
- Turbo Grout Epoxy
- Poxy-Chock
- Rapid Resin Repair
- Splash Zone Epoxy
- Rebar Epoxy Spray (J-62)

### POLYMER FLOOR COATINGS

- Spec Cote 100™
- Spec Cote 100 Clear™
- Spec Cote 100 CR™
- Spec Cote Urethane™
- Spec Cote WB™

### SURFACE RETARDERS

- Face-Off™ Manufactured by Grace
- Top-Cast™ Manufactured by Grace

### JOINT SEALANTS / JOINT FILLERS

- Perma 230 SL
- Poxyfil™ (J-52)
- Prison-Loc
- Jointfill™

### EVAPORATION REDUCERS

- Sure-Film (J-74)
- Sure Film RTU (J-74 RTU)

### LATEX BONDING AGENTS /

- Day-Chem Ad Bond (J-40)™
- Day-Chem CI Ad Bond (J-40CI)
- Levelayer™ Bonding Agent (J-42)
- Superior Concrete Bondor (J-41)

### CLEANERS AND STRIPPERS

- Citrus Peel (J-48)
- Destructo
- Green Bean Clean

### LEED / GREEN

- Bio-Release EF
- Clear Dissipating Cure EF
- Cure & Seal 1315 EF
- Cure & Seal 309 EF
- Cure-Lift EF
- Ultra Seal 30 EF
- White Dissipating Cure EF

## Construction Powders

### CONCRETE REPAIR

- Ankertite™
- Architectural Finish
- Civil/Structural FPX
- Civil/Structural VO
- CM 2000™
- Day-Chem Perma Patch™
- HD-25
- HD-45
- HD-50™
- Rapid Resin Repair
- Re-Crete™ 5 Minute Set
- Re-Crete 20 Minute Set
- Re-Crete Light 5 Minute Patch
- Re-Crete Light 20 Minute Patch
- Perma Patch V/O
- Perma Patch F/P
- Polyfast™ FS
- Polyfast LPL
- SnaPlug
- Thin Resurfacer™

### DAMPPROOFING/WATERPROOFING

- Seal Coat™ 1000
- Smooth Coat™
- Water Stop™

### GROUTS (NON-SHRINK)

- 1107 Advantage Grout
- Multi-Purpose Grout
- Sure-Grip Epoxy Grout (J-55 HES)
- Sure-Grip Ferro Grout
- Sure-Grip Grout Dri-Pak™
- Sure-Grip High Performance Grout™
- Sure-Grip UW Grout
- Turbo Grout™ HP-10
- Turbo Grout HP-12
- Turbo Grout LT-12
- Turbo Grout Epoxy
- TC 1.4 Geothermal Grout

### FLOOR LEVELERS

- EconoLevel™
- Level Topping White
- Levelayer
- Levelayer MT
- Levelayer Primer J-42™
- Sure Finish™
- Sure Patch™
- Topping™
- Topping EXT™
- Underlayment Tool Kit

### HARDENERS AND INDUSTRIAL TOPPING

- Emery Non-Slip™
- Emery Tuff™
- Emery Tuff Top
- Ferro Tuff™
- Ferro Tuff LR
- Ferro Tuff Non-Rusting
- Ferro Tuff Top
- Quartz Tuff™

## Table 1.1 Reinforcing Bar Data

Reinforcing Bars Size Designations and Nominal Dimensions						
Bar Size Designation			Nominal Dimensions			Ultimate Minimum Capacity 1.5 <sub>y</sub>
US	Metric (mm)	CN (M)	Diameter (inches)	Area (inches <sup>2</sup> )	Weight (lbs/ft)	Pounds
#4	[13]	[10]	0.500	0.20	0.688	18,000
#5	[16]	[15]	0.625	0.31	1.043	27,900
#6	[19]	[20]	0.750	0.44	1.502	39,600
#7	[22]	—	0.875	0.60	2.044	54,000
#8	[25]	[25]	1.000	0.79	2.670	71,700
#9	[29]	[30]	1.128	1.00	3.400	90,000
#10	[32]	—	1.270	1.27	4.303	114,300
#11	[36]	[35]	1.410	1.56	5.313	140,400
#14	[43]	[45]	1.693	2.25	7.650	202,500
#18	[57]	[55]	2.257	4.00	13.600	360,000

\*Rebar size is based on the number of eighths of an inch included in the nominal diameter of the bar.

**Note:** The nominal dimensions of a deformed rebar are equivalent to those of a plain, round bar having the same weight (mass) per foot (meter) as the deformed rebar.

Nearly all reinforcing bars currently produced in the USA are marked with the numbers 13, 16, etc., to designate bar sizes. These bar size numbers correspond to the traditional designations 4, 5, etc., as shown in the accompanying table.

ACI 318-02 still list the bar sizes traditionally using #3 - #18 designations. The tables in this manual are typically designated #3 [#10] or simply use the traditional designations.

## Table 1.2 Mechanical Requirements for Standard ASTM Deformed Reinforcing Bars\*

Type of Steel and ASTM Designation	Bar Nos. Range	Grade <sup>1</sup>	Minimum <sup>2</sup> Yield Strength, psi	Minimum Tensile Strength, psi	Minimum Percentage Elongation in 8 in.	Cool Bend Test <sup>3</sup> Pin Diameter (d=nominal diameter of specimen)
Billet-Steel A615	3-6	40	40,000	70,000	#3.....11 #4, #5, #6.....12	#3, #4, #5.....3-1/2d #6.....5d
	3-11, 14, 18	60	60,000	90,000	#3, #4, #5, #6.....9 #7, #8.....8 #9, #10, #11, #14, #18...7	#3, #4, #5.....3-1/2d #6, #7, #8.....5d #9, #10, #11.....7d #14, #18 (90°).....9d
	6-11, 14, 18	75	75,000	100,000	#6, #7, #8.....7 #9, #10, #11, #14, #18...6	#6, #7, #8.....5d #9, #10, #11.....7d #14, #18 (90°).....9d
Low-Alloy Steel A706	3-11, 14, 18	60	60,000 <sup>4</sup>	80,000 <sup>5</sup>	#3, #4, #5, #6.....14 #7, #8, #9, #10, #11....12 #14, #18.....10	#3, #4, #5.....3d #6, #7, #8.....4d #9, #10, #11.....6d #14, #18.....8d

\* For the mechanical requirements of rail-steel and axle-steel bars, see ASTM specifications A616 and A617, respectively.

<sup>1</sup> Minimum yield designation (KSI).

<sup>2</sup> Yield point or yield strength. See ASTM specifications.

<sup>3</sup> Test bends 180°, unless noted otherwise.

<sup>4</sup> Maximum yield strength 78,000 psi (ASTM A706 only).

<sup>5</sup> Tensile Strength shall not be less than 1.25 times the actual yield strength (ASTM A706 only).

## Table 1.3 Mechanical Splice ACI and ICC Code Requirements

Mechanical Splice ACI & ICC Code Requirements					
ASTM	Bar	Specified	Specified	Mechanical Splice Requirement - psi	
Bar Type	Grade	Yield, psi	Ultimate, psi	Type 1	Type 2
A706	60	60,000	80,000	75,000	80,000
A615	40	40,000	60,000	50,000	60,000
A615	60	60,000	90,000	75,000	90,000
A615	75	75,000	100,000	93,750	100,000

Mechanical Splice Requirement –

ACI 318 Chapters 12 and 21 state the requirements for mechanical splices. They are as follows:

**Type 1 Mechanical Splice** shall develop in tension and compression as required at least 125% of the specified yield of the bar.

Example: For ASTM A615 Grade 60 bar:  $1.25 \times 60,000\text{psi} = \mathbf{75,000\text{psi}}$

Therefore, a splice test exceeding 75,000 psi meets the Type 1 requirement for A615 Grade 60 bar

**Type 2 Mechanical Splice** shall conform to Type 1 requirements and develop 100% of the specified ultimate strength of the bar being spliced.

Example: For ASTM A615 Grade 60 bar:  $1.00 \times 90,000\text{psi} = \mathbf{90,000\text{psi}}$

Therefore, a splice test exceeding 90,000 psi meets the Type 1 and Type 2 requirement for A615 Grade 60 bar.

## Table 1.4 Deformation Requirements for Standard ASTM Deformed Reinforcing Bars

Bar Size Designation			Max. Average Spacing, in.	Max. Average Height, in.	Maximum* Gap, in.
US	Metric (mm)	CN (M)			
#3	[10]	—	0.262	0.015	0.143
#4	[13]	[10]	0.350	0.020	0.191
#5	[16]	[15]	0.437	0.028	0.239
#6	[19]	[20]	0.525	0.038	0.286
#7	[22]	—	0.612	0.044	0.334
#8	[25]	[25]	0.700	0.050	0.383
#9	[29]	[30]	0.790	0.056	0.431
#10	[32]	—	0.889	0.064	0.487
#11	[36]	[35]	0.987	0.071	0.540
#14	[43]	[45]	1.185	0.085	0.648
#18	[57]	[55]	0.58	0.102	0.864

\*Chord of 12.5% of nominal perimeter

## Table 1.5 Chemical Composition Requirements for Standard ASTM Deformed Reinforcing Bars

Type of Steel and ASTM Designation	Condition*	Element									
		Carbon (C)	Manganese (Mn)	Phosphorus (P)	Sulphur (S)	Silicon (Si)	Copper (Cu)	Nickel (Ni)	Chromium (Cr)	Molybdenum (Mo)	Vanadium (V)
Billet-Steel A615	1	X	X	X	X						
	2			0.06%							
	3			0.075%							
Low-Alloy Steel A706	1	X	X	X	X	X	X	X	X	X	X
	2	0.30%	1.50%	0.035%	0.045%	0.50%					
	3	0.33%	1.56%	0.043%	0.053%	0.55%					

\*CONDITION DEFINITIONS:

1. Analysis required of these elements for each heat.
2. Maximum allowable chemical content for each heat.
3. Maximum allowable chemical content for finished bar.

**Table 1.6 Grade 60 Rebar**  
**ACI Compression Development and**  
**Lap Splice Lengths for  $f'_c = 3,000$  psi to 5,000 psi**

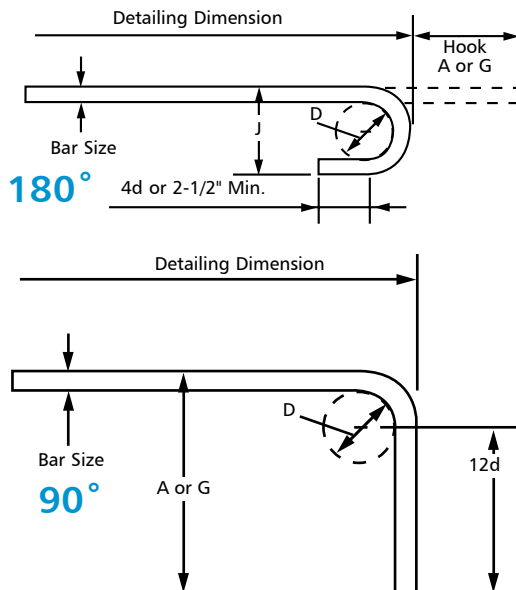
Bar Size Designation			Compression Development Lengths per $f'_c$			Compression Lap Splice Length
US	Metric (mm)	CN (M)	$f'_c = 3,000$ psi	$f'_c = 4,000$ psi	$f'_c = 5,000$ psi	
#3	[10]	—	9	8	8	12
#4	[13]	[10]	11	10	9	15
#5	[16]	[15]	14	12	12	19
#6	[19]	[20]	17	15	14	23
#7	[22]	—	19	17	16	27
#8	[25]	[25]	22	19	18	30
#9	[29]	[30]	25	22	21	34
#10	[32]	—	28	24	23	38
#11	[36]	[35]	31	27	26	43
#14	[43]	[45]	37	32	31	N/A
#18	[57]	[55]	50	43	41	N/A

**Notes:**

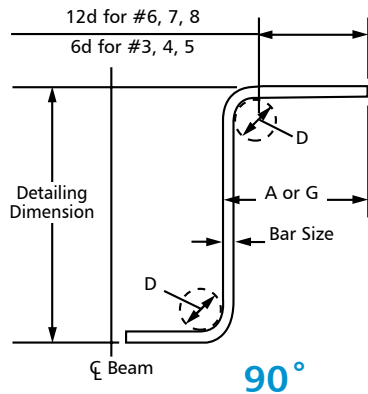
1. Tabulated values are based on Grade 60 reinforcing bars and normal-weight concrete.
2. Compression development lengths and compression lap splice lengths are based on ACI 318-02, Sections 12.3 and 12.16, respectively. Lengths are in inches.
3. For compression development lengths, if bars are enclosed in spirals or ties conforming to ACI 318-02, Section 12.3.3(b), then a modification factor of 0.75 may be applied but the resulting length must not be less than 8 in.
4. For compression lap splice lengths:
  - a. If bars are enclosed in a tied-reinforced compression member conforming to ACI 318-02, Section 12.17.2.4, then a modification factor of 0.83 may be applied but the resulting length must not be less than 12 in.
  - b. If bars are enclosed in a spirally-reinforced compression member conforming to ACI 318-02, Section 12.17.2.5, then a modification factor of 0.75 may be applied but the resulting length must not be less than 12 in.
  - c. The tabulated lengths are applicable for all concrete strengths of at least 3,000 psi.
5. ACI 318-02 does not allow lap splices of #14 [#43] and #18 [#57] bars.

**Table 1.7 Recommended End Hooks**  
**All Grades: D = Finished bend diameter**

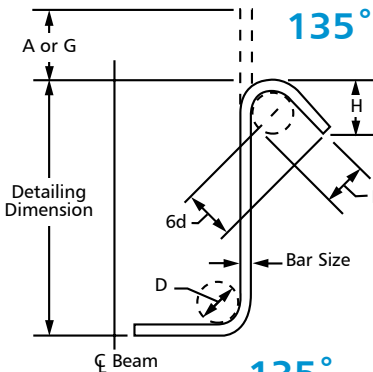
Bar Size Designation			D (in.)	180° Hooks		90° Hooks
US	Metric (mm)	CN (M)		A or G	J	A or G
#3	[10]	—	2½"	5"	3"	6"
#4	[13]	[10]	3"	6"	4"	8"
#5	[16]	[15]	3¾"	7"	5"	10"
#6	[19]	[20]	4½"	8"	6"	1'-0"
#7	[22]	—	5¼"	10"	7"	1'-2"
#8	[25]	[25]	6"	11"	8"	1'-4"
#9	[29]	[30]	9½"	1'-3"	11¾"	1'-7"
#10	[32]	—	10-¾"	1'-5"	1'-1¼"	1'-10"
#11	[36]	[35]	12"	1'-7"	1'-2¾"	2'-0"
#14	[43]	[45]	18¾"	2'-3"	1'-9¾"	2'-7"
#18	[57]	[55]	24"	3'-0"	2'-4½"	3'-5"



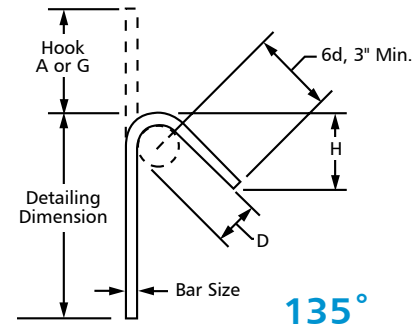
## Recommended Industry Practice for Stirrup and Tie Hooks



90°



135°



135°

**Table 1.8 Stirrup (Ties Similar)**

Stirrup and Tie Hook Dimensions All Grades:

Bar Size Designation			D (in.)	90°		135°	
US	Metric (mm)	CN (M)		A or G	A or G	H*	
#3	[10]	—	1½"	4"	4"	2½"	
#4	[13]	[10]	2"	4½"	4½"	3"	
#5	[16]	[15]	2½"	6"	5-½"	3¾"	
#6	[19]	[20]	4½"	1'-0"	8"	4½"	
#7	[22]	—	5¼"	1'-2"	9"	5¼"	
#8	[25]	[25]	6"	1'-4"	10½"	6"	

\*H dimension is approximate.

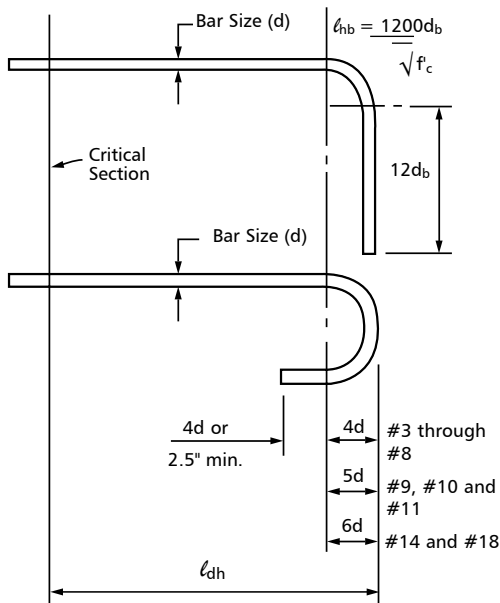
**Table 1.9 135° Seismic Stirrup/Tie**

Hook Dimensions All Grades: Seismic Stirrup/Tie Hooks

Bar Size Designation			135° Seismic Hook		
US	Metric (mm)	CN (M)	D (in.)	A or G	H*
#3	[10]	—	1½"	4¼"	3"
#4	[13]	[10]	2"	4½"	3"
#5	[16]	[15]	2½"	5½"	3¾"
#6	[19]	[20]	4½"	8"	4½"
#7	[22]	—	5¼"	9"	5¼"
#8	[25]	[25]	6"	10½"	6"

\*H dimension is approximate.

## Development $\ell_{dh}$ of Standard Hooks



**Table 1.10 ACI Hook Development Lengths for  $f'_c = 3,000$  to 5,000 psi**

Bar Size Designation			$f'_c = 3,000$ psi	$f'_c = 4,000$ psi	$f'_c = 5,000$ psi
US	Metric (mm)	CN (M)			
#3	[10]	—	9	7	7
#4	[13]	[10]	11	10	9
#5	[16]	[15]	14	12	11
#6	[19]	[20]	17	15	13
#7	[22]	—	19	17	15
#8	[25]	[25]	22	19	17
#9	[29]	[30]	25	22	19
#10	[32]	—	28	24	22
#11	[36]	[35]	31	27	24
#14	[43]	[45]	37	32	29
#18	[57]	[55]	50	43	39

### Notes:

1. Tabulated values are based on Grade 60 reinforcing bars and normal-weight concrete.
2. Tension development lengths of standard hooks are based on ACI 318-02, Section 12.5. Lengths are in inches.
3. For bar sizes #3 [#10] through #11 [#36] only:
  - a. If concrete cover conforms to ACI 318-02, Section 12.5.3(a), then a modification factor of 0.7 may be applied but the resulting length must not be less than  $8d_b$  nor 6 in.
  - b. If hook is enclosed in ties or stirrups conforming to ACI 318-02, Section 12.5.3(b), then a modification factor of 0.8 may be applied but the resulting length must not be less than  $8d_b$  nor 6 in.
4. For epoxy-coated hooks, multiply the tabulated values by 1.2.

**Table 1.11 Tension Lap Splice Lengths – Grade 60 Uncoated Bars**  
 $f'_c = 3,000$  psi or greater, Normal Weight Concrete

**DESIGN AND DETAILING DATA – ACI** ACI Tension Lap Splice Lengths for  $f'_c = 3,000, 4,000$ , and  $5,000$  psi

Bar Size Designation			Lap Class	f <sub>c</sub> = 3,000 psi				f <sub>c</sub> = 4,000 psi				f <sub>c</sub> = 5,000 psi			
US	Metric (mm)	CN (M)		Top Bars		Other Bars		Top Bars		Other Bars		Top Bars		Other Bars	
				Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2
#3	[10]	—	A	22	32	17	25	19	28	15	22	17	25	13	19
			B	28	42	22	32	24	36	19	28	22	33	17	25
#4	[13]	[10]	A	29	43	22	33	25	37	19	29	22	33	17	26
			B	37	56	29	43	32	48	25	37	29	43	22	33
#5	[16]	[15]	A	36	54	28	41	31	47	24	36	28	42	22	32
			B	47	70	36	54	40	60	31	47	36	54	28	42
#6	[19]	[20]	A	43	64	33	50	37	56	29	43	33	50	26	38
			B	56	84	43	64	48	72	37	56	43	65	33	50
#7	[22]	—	A	63	94	48	72	54	81	42	63	49	73	37	56
			B	81	122	63	94	70	106	54	81	63	94	49	73
#8	[25]	[25]	A	72	107	55	82	62	93	48	72	55	83	43	64
			B	93	139	72	107	80	121	62	93	72	108	55	83
#9	[29]	[30]	A	81	121	62	93	70	105	54	81	63	94	48	72
			B	105	157	81	121	91	136	70	105	81	122	63	94
#10	[32]	—	A	91	136	70	105	79	118	61	91	70	105	54	81
			B	118	177	91	136	102	153	79	118	91	137	70	105
#11	[36]	[35]	A	101	151	78	116	87	131	67	101	78	117	60	90
			B	131	196	101	151	113	170	87	131	101	152	78	117
#14	[43]	[45]	N/A	121	181	93	139	105	157	81	121	94	140	72	108
#18	[57]	[55]	N/A	161	241	124	186	139	209	107	161	125	187	96	144

**Notes:**

- Tabulated values are based on Grade 60 reinforcing bars and normal-weight concrete.
- Tension development lengths and tension lap splice lengths are based on ACI 318-02, Sections 12.2.2 and 12.15, respectively. Tabulated values for beams or columns are based on transverse reinforcement and concrete cover meeting minimum Code requirements. Lengths are in inches.
- Cases 1 and 2, which depend on the type of structural element, concrete cover, and the center-to-center spacing of the bars, are defined as:

Beams or Columns	Case 1	Cover at least $1d_b$ and c.-c. spacing at least $2d_b$
	Case 2	Cover less than $1d_b$ or c.-c. spacing less than $2d_b$
All Others	Case 1	Cover at least $1d_b$ and c.-c. spacing at least $3d_b$
	Case 2	Cover less than $1d_b$ or c.-c. spacing less than $3d_b$
- Lap Class A values are the required tension development lengths,  $\ell_d$ ; lap splice lengths are multiples of tension development lengths; Class A -  $1.0\ell_d$  and Class B =  $1.3\ell_d$  (ACE 318-02, Section 12.15.1).
- Lap splices of #14 [#43] or #18 [#57] bars are not permitted. The tabulated values for those bar sizes are the tension development lengths.
- Top bars are horizontal bars with more than 12 inches of concrete cast below the bars.
- For lightweight aggregate concrete, multiply the tabulated values by 1.3; or when  $f_{ct}$  is specified, the factor is  $6.7\sqrt{f'_{ct}}/f_{ct} \geq 1.0$ .
- For epoxy-coated bars, multiply the tabulated values by one of the following factors:

Concrete Cover and Spacing	Top Bars	Other Bars
Cover $< 3d_b$ or c.-c. spacing $> 7d_b$	1.7 / 1.3 - 1.31	1.50
Cover $\leq 3d_b$ or c.-c. spacing $\leq 7d_b$	1.20	1.20



**Table 1.11 Metric Conversion Factors**

Quantity	To Convert From...	To...	Multiply By...
<b>Length</b>	mile	km	1.609 344*
	yard	m	0.9144*
	foot	m	0.3048*
	foot	mm	304.8*
	inch	mm	25.4*
<b>Area</b>	square mile	km <sup>2</sup>	2.589 998
	acre	m <sup>2</sup>	4046.873
	acre	ha	0.404 687 3
	square yard	m <sup>2</sup>	0.836 127 4*
	square foot	m <sup>2</sup>	0.092 903 04*
	square inch	mm <sup>2</sup>	645.16*
<b>Volume</b>	acre foot	m <sup>3</sup>	1233.489
	cubic yard	m <sup>3</sup>	0.764 554 9
	cubic foot	m <sup>3</sup>	0.028 316 85
	cubic foot	cm <sup>3</sup>	28 316.85
	cubic foot	L	28.316 85
	100 board feet	m <sup>3</sup>	0.235 973 7
	gallon	L	3.785 412
	cubic inch	cm <sup>3</sup>	16.387 06
	cubic inch	mm <sup>3</sup>	16 387.06
<b>Mass</b>	pound	kg	0.453 592 4
	ton (2,000 pounds)	kg	907.184 7
	kip	t	0.453 592 4
<b>Mass/ Unit Length</b>	pound/foot	kg/m	1.488 164
<b>Mass/Unit Area</b>	pound/foot <sup>2</sup>	kg/m <sup>2</sup>	4.882 428
<b>Mass Density</b>	pound/foot <sup>3</sup>	kg/m <sup>3</sup>	16.018 46
<b>Force</b>	pound	N	4.448 222
	kip	kN	4.448 222
<b>Force/ Unit Length</b>	pound/foot	N/m	14.593 90
	kip/foot	kN/m	14.593 90
<b>Pressure, Stress</b>	pound/foot <sup>2</sup>	Pa	47.880 26
	kip/foot <sup>2</sup>	kPa	47.880 26
	pound/inch <sup>2</sup>	kPa	6.894 757
	kip/inch <sup>2</sup>	MPa	6.894 757
	pound/inch <sup>2</sup>	N/mm <sup>2</sup>	0.006 895
	kip/inch <sup>2</sup>	N/mm <sup>2</sup>	6.894 757
<b>Moment, Torque</b>	foot-pound	N•m	1.355 818
	foot-kip	kN•m	1.355 818
<b>Moment of Mass</b>	pound-foot	kg•m	0.138 255 0
<b>Moment of Inertia</b>	pound-foot <sup>2</sup>	kg•m <sup>2</sup>	0.042 140 11
<b>Second Moment of Inertia</b>	inch <sup>4</sup>	mm <sup>4</sup>	416 231.4
<b>Section Modulus</b>	inch <sup>3</sup>	mm <sup>3</sup>	16 387.06
<b>Temperature</b>	°F	°C	(°F-32)/5/9
<b>Plane Angle</b>	degree	rad	0.017 453 29

**Note:** Asterisk denotes exact number.

A large rectangular area filled with a light blue grid, intended for technical sketches and handwritten notes.

## Dowel Bar Splicer System\*

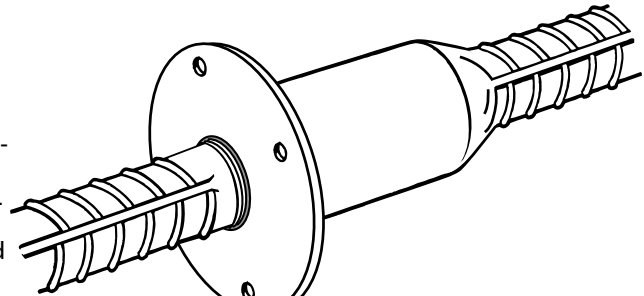
ICC Evaluation Report No. 4028

The Dayton Superior Dowel Bar Splicer System is a two-piece, standard mechanical splicing technique (splicing bars of equal size) that eliminates protruding dowels. Typical applications include splicing reinforcement bars in monolithic structures, rebar anchorages, future expansion, and dowel bar substitution at construction joints.

The components of the system, the Splicer and Dowel-In, are manufactured from standard grade 60 rebar material. Basic fabrication consists of forging and threading operations. No welding or machining is required and the threading operation does not reduce the nominal cross-sectional area of the bar. The completed splice (joined Splicer and Dowel-In) obtains ultimate bar strengths and meets or exceeds all existing code requirements including 160%  $f_y$  or 95% of bar actual tensile requirements as identified by ICC acceptance criteria AC 133.

## System Advantages

The patented Dowel Bar Splicer System has been engineered, tested and proven to meet or exceed all field standards and design/engineering practices. The System is easy to use and readily identified as rebar material. The easy installation requires no special tools or machinery and simplifies the forming operations. There are no "extras," such as wedges, nuts, collars or couplers required and routine cutting, bending, etc., can be easily handled in the field, if required.



\*U.S. Patent No. 4,619,096

### The Dayton Superior Dowel Bar Splicer System Advantages:

- Strong
- Safe
- Easy to Use
- Eliminates Protruding Dowels
- Improves Forming Costs
- Reduces Forming and Stripping Hassles
- Saves Forms By Eliminating Drilling Holes
- No Forming Required

## System Compliance

The Dowel Bar Splicer System complies with the following standards/specifications:

- International Conference of Building Officials (ICC Report #4028).
- City of Los Angeles Research Report RR 24518.
- American Concrete Institute (ACI Standard 318).
- State Departments of Transportation.
- Corps of Engineers (Specification CW03210).

## Typical Splicing Specification

The Dayton Superior Dowel Bar Splicer System, consisting of the Dowel Bar Splicer and Dowel-In, shall be used in splicing of rebar. The Dowel Bar Splicer shall be forged from ASTM A-615 grade 60 deformed rebar material, free of external welding and machining. It shall be furnished with an integral nailing flange and threaded with UNC or UN thread to a depth equal to the nominal thread diameter. The Dowel-In shall be fabricated from ASTM A-615 grade 60 deformed rebar material with thread corresponding to the Splicer. The completed splice shall meet 160%  $f_y$  exceeding tensile requirements of American Concrete Institute Specification 318, Building Code Requirements for Reinforced Concrete and the Corps of Engineers Specification CW03210, Civil Works Construction Guide Specification for Steel Bars, Welded Steel Wire Fabric and Accessories for Concrete Reinforcement.

### Specific:

- Mechanical connections shall be Dowel Bar Splice System (DB/DI) parallel threaded couplers as manufactured by Dayton Superior Corporation.

### Generic:

- The mechanical connection shall meet building code requirements of developing in tension and compression as required by \_\_\_\_\_ (insert name here). The mechanical connection shall be the forged and parallel threaded type coupler manufactured from high quality steel. All couplers shall be installed per the manufacturer's approved procedures.

## Recommended Dowel Bar Splicer and Dowel-In Sizes

Specified or Required Dowel Bar						Recommended Dowel Bar Splicer and Dowel-In						
Bar Size			Grade 60 Rebar Loads (lbs.)			System Thread Size*	DB-SAE Bar Size	Dowel-In Bar Size	System Stress Area (min.)	Completed Splice (lbs.)		
US	Metric (mm)	CN (M)	P <sub>y</sub>	1.25 P <sub>y</sub>	P <sub>ult</sub>					P <sub>y</sub>	1.25 P <sub>y</sub>	Minimum P <sub>ult</sub> Range = 95% F <sub>u</sub> Actual or 160% F <sub>y</sub> Specified**
#4	[13]	[10]	12,000	15,000	18,000	5/8"-11	#4	#4	.20	12,000	15,000	19,200
#5	[16]	[15]	18,600	23,250	27,900	3/4"-10	#5	#5	.31	18,600	23,250	29,760
#6	[19]	[20]	26,400	33,000	39,600	7/8"-9	#6	#6	.44	26,400	33,000	42,400
#7	[22]	—	36,000	45,000	54,000	1"-8	#7	#7	.60	36,000	45,000	57,600
#8	[25]	[25]	47,400	59,250	71,100	1-1/8"-8	#8	#8	.79	47,400	59,250	75,840
#9	[29]	[30]	60,000	75,000	90,000	1-1/4"-8	#9	#9	1.00	60,000	75,000	96,000
#10	[32]	—	76,200	95,250	114,000	1-7/16"-8	#10	#10	1.27	76,200	95,250	121,920
#11	[36]	[35]	93,600	117,000	140,400	1-9/16"-8	#11	#11	1.56	93,600	117,000	149,760

P<sub>y</sub>=Minimum Yield Strength of bar.

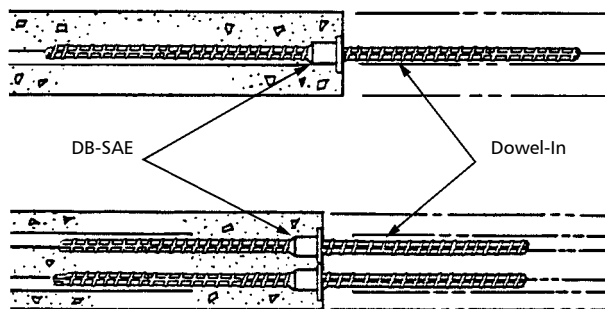
\*5/8", 3/4", 7/8" and 1" sizes have UNC Threads. 1-1/8" and larger sizes are equipped with UN Threads.

\*\*Loads shown based on 160% f<sub>y</sub> specified.

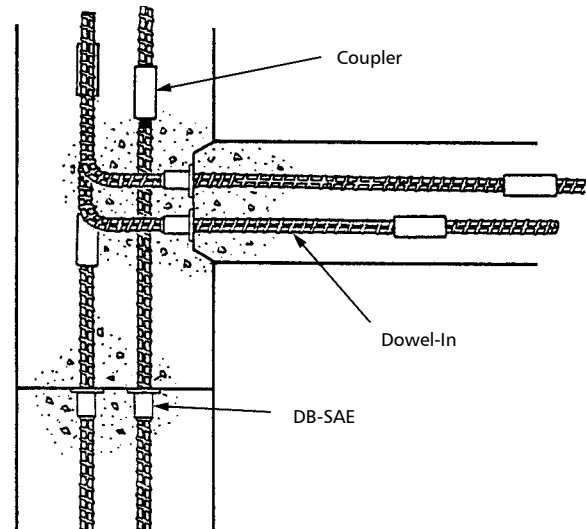
## Required Development and Lap Lengths for Grade 60, Uncoated Bottom Reinforcement in Normal Weight Concrete

Application	f' <sub>c</sub> psi	#6 and Smaller Bars	#7 and Larger Bars
Clear spacing of bars being developed or spliced not less than d <sub>b</sub> , clear cover not less than d <sub>b</sub> , and beam stirrups or column ties throughout $\ell_d$ not less than the code minimum or Clear spacing of bars being developed or spliced not less than 2d <sub>b</sub> and clear cover not less than d <sub>b</sub>	3,000	44d <sub>b</sub>	55d <sub>b</sub>
	4,000	38d <sub>b</sub>	47d <sub>b</sub>
	5,000	34d <sub>b</sub>	42d <sub>b</sub>
	6,000	31d <sub>b</sub>	39d <sub>b</sub>
	8,000	27d <sub>b</sub>	34d <sub>b</sub>
	10,000	24d <sub>b</sub>	30d <sub>b</sub>
Other cases	3,000	66d <sub>b</sub>	82d <sub>b</sub>
	4,000	57d <sub>b</sub>	71d <sub>b</sub>
	5,000	51d <sub>b</sub>	64d <sub>b</sub>
	6,000	46d <sub>b</sub>	58d <sub>b</sub>
	8,000	40d <sub>b</sub>	50d <sub>b</sub>
	10,000	36d <sub>b</sub>	45d <sub>b</sub>

## Typical Threaded Splicing Applications



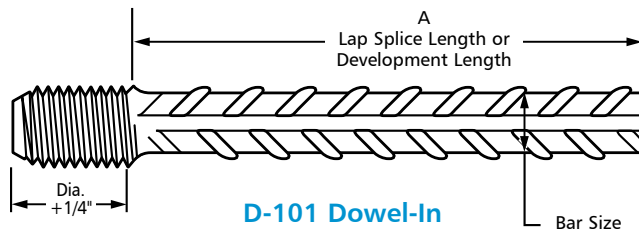
Typical Dowel Bar Splicer/Dowel-In Applications



## Dowel Bar Splicer System

### D-101 Dowel-in, D-102 90° Hooked Dowel-in, D-103 180° Hooked Dowel-in, D-104 Double-Ended Dowel-in

The Dayton Superior Dowel-In is available Straight (D-101), 90° and 180° Hooked (D-102 and D-103) and Double-Ended (D-104). Each is manufactured from grade 60 deformed rebar material and is available in rebar sizes #4 through #11 in plain or epoxy coated finish. The threaded end of the Dowel-In is enlarged by forging, before threading, to ensure that the cross-sectional area of the bar is not reduced by the threading operation. This design feature assures full ultimate strength of the rebar. Dowel-ins are configured to facilitate easy installation and can be easily assembled by hand. On larger projects, such as highway paving, a centrifugal chuck on an electric or air-powered drill motor can be employed to speed installation. See the D-49 Magna Jaw on page 55.



#### To Order:

Specify: (1) quantity, (2) name, (3) bar size (should be equivalent to the rebar being substituted for on the structural drawings), (4) dimensions required (see below).

#### Example:

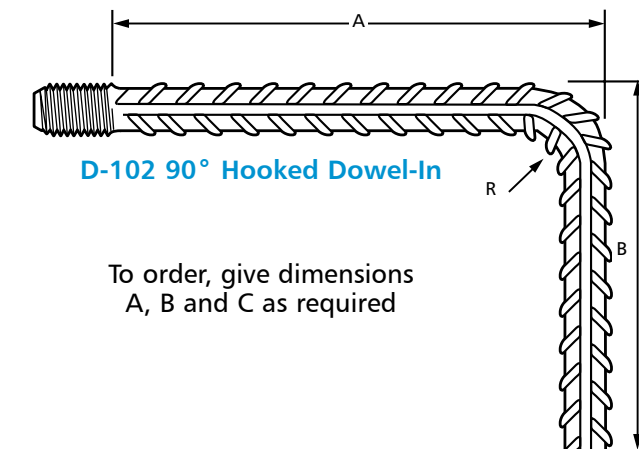
600, D-102 90° Hooked Dowel-Ins, #5 rebar, A=14", B=8"

Specified or Required Dowel Bar						Recommended Dowel Bar Splicer and Dowel-In						
Bar Size			Grade 60 Rebar Loads (lbs.)			System Thread Size*	DB-SAE Bar Size	Dowel-In Bar Size	System Stress Area (min.)	Completed Splice (lbs.)		
US	Metric (mm)	CN (M)	P <sub>y</sub>	1.25 P <sub>y</sub>	P <sub>ult</sub>					P <sub>y</sub>	1.25 P <sub>y</sub>	Minimum P <sub>ult</sub> Range = 95% F <sub>u</sub> Actual or 160% F <sub>y</sub> Specified**
#4	[13]	[10]	12,000	15,000	18,000	5/8"-11	#4	#4	.20	12,000	15,000	19,200
#5	[16]	[15]	18,600	23,250	27,900	3/4"-10	#5	#5	.31	18,600	23,250	29,760
#6	[19]	[20]	26,400	33,000	39,600	7/8"-9	#6	#6	.44	26,400	33,000	42,400
#7	[22]	—	36,000	45,000	54,000	1"-8	#7	#7	.60	36,000	45,000	57,600
#8	[25]	[25]	47,400	59,250	71,100	1-1/8"-8	#8	#8	.79	47,400	59,250	75,840
#9	[29]	[30]	60,000	75,000	90,000	1-1/4"-8	#9	#9	1.00	60,000	75,000	96,000
#10	[32]	—	76,200	95,250	114,000	1-7/16"-8	#10	#10	1.27	76,200	95,250	121,920
#11	[36]	[35]	93,600	117,000	140,400	1-9/16"-8	#11	#11	1.56	93,600	117,000	149,760

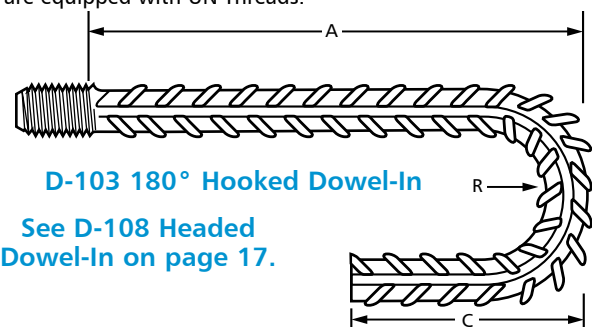
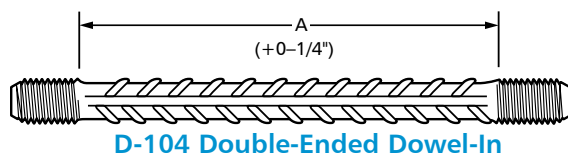
P<sub>y</sub>=Minimum Yield Strength of bar.

\*5/8", 3/4", 7/8" and 1" sizes have UNC Threads. 1-1/8" and larger sizes are equipped with UN Threads.

\*\*Loads shown based on 160% f<sub>y</sub> specified.



To order, give dimensions A, B and C as required



See D-108 Headed Dowel-In on page 17.

Bar Size Designation			D-101 Minimum MFG. Length DI DOWEL INS	D-104 Minimum Length Double End Dowel Ins.	D-104 Minimum Length Double End Dowel Ins.
US	Metric (mm)	CN (M)			
#4	[13]	[10]	9"	4" *	8" **
#5	[16]	[15]	9"	5" *	8" **
#6	[19]	[20]	9 1/4"	6" *	8" **
#7	[22]	—	9 1/4"	7" *	8" **
#8	[25]	[25]	15 1/2"	8" *	14" **
#9	[29]	[30]	15 1/2"	9" *	14" **
#10	[32]	—	15 3/4"	10" *	14" **
#11	[36]	[35]	16"	11" *	14" **

NOTE: To be manufactured as Single End

\* Tolerance on Bending Plus 0 / Minus 1" on "A" Dimension

\*\* Plus thread each end.

## Dowel Bar Splicer System

### D-101-A Straight Dowel Bar Splicer DB-SAE, D-102-A 90° Hooked Dowel Bar Splicer, D-103-A 180° Hooked Dowel Bar Splicer, D-104-A Double-Ended Dowel Bar Splicer

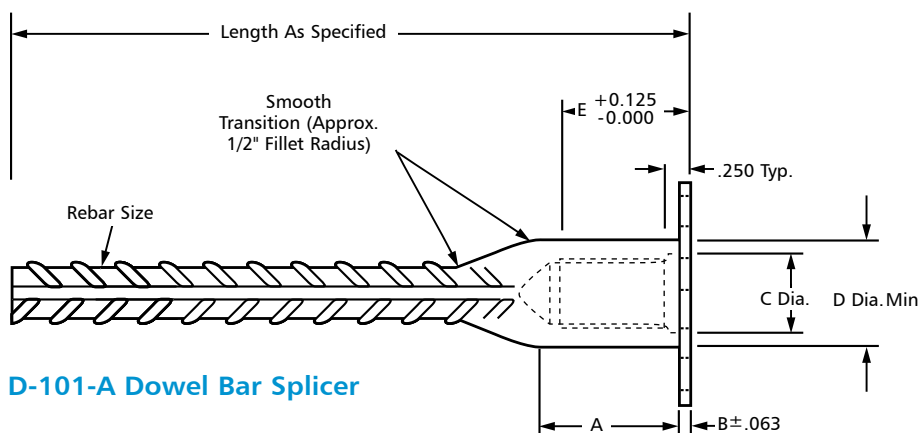
The Dayton Superior Dowel Bar Splicer is a one-piece unit, integrally forged from ASTM A615 grade 60 deformed rebar material. The splicers are available in #4 through #11 rebar sizes to be used in conjunction with the corresponding size dowel-in to accomplish a mechanical splice designed to achieve 160% of specified yield (full mechanical ultimate).

The splicer can be furnished straight (D-101-A) cut to length, 90° and 180° hooked (D-102-A and D-103-A) and double-ended (D-104-A) in plain or epoxy coated finish. The splicer can also be special-ordered with a reduced diameter washer flange or with the washer flange clipped (in more than one direction, if required) to provide adequate concrete cover, or to avoid interference.

The D-104-A Double-Ended Dowel Bar Splicer is used to establish a direct load path through a concrete section, thus avoiding multiple hooked rebar and eliminating rebar congestion. The double-ended unit can be configured in a "U" shape for special applications.

Bar Size Designation			Thread Size	A	B	C	D	E	Flange Diameter	Minimum P <sub>ult</sub> Range = 95% F <sub>y</sub> Actual or 160% F <sub>y</sub> Specified*
US	Metric (mm)	CN (M)								
#4	[13]	[10]	5/8"-11 UNC	1-1/8"	1/8"	11/16"	55/64"	1"	1-7/8"	19,200 lbs.
#5	[16]	[15]	3/4"-10 UNC	1-9/16"	1/8"	13/16"	1-3/64"	1-1/8"	2-1/16"	29,760 lbs.
#6	[19]	[20]	7/8"-9 UNC	1-11/16"	1/8"	15/16"	1-15/64"	1-1/4"	2-1/4"	42,400 lbs.
#7	[22]	—	1"-8 UNC	1-27/32"	1/8"	1-1/16"	1-27/64"	1-3/8"	2-7/16"	57,600 lbs.
#8	[25]	[25]	1-1/8"-8 UN	2-1/16"	1/8"	1-3/16"	1-19/32"	1-1/2"	2-5/8"	75,840 lbs.
#9	[29]	[30]	1-1/4"-8 UN	2-3/16"	1/8"	1-5/16"	1-25/32"	1-5/8"	2-13/16"	96,000 lbs.
#10	[32]	—	1-7/16"-8 UN	2-7/16"	1/8"	1-1/2"	2"	1-13/16"	3"	121,920 lbs.
#11	[36]	[35]	1-9/16"-8 UN	2-9/16"	1/8"	1-5/8"	2-7/32"	1-15/16"	3-1/4"	149,760 lbs.

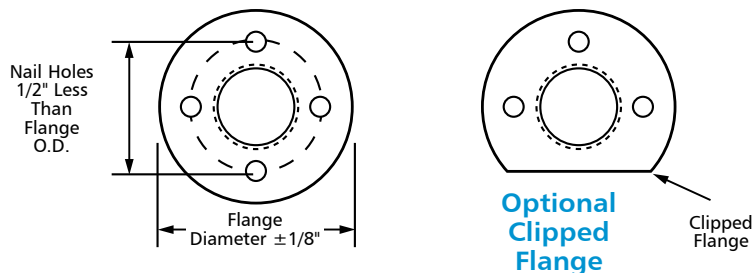
\*Loads shown based on 160% f<sub>y</sub> specified



**D-101-A Dowel Bar Splicer**

Bar Size Designation			D-101-A Minimum MFG. Length DB-SAE
US	Metric (mm)	CN (M)	
#4	[13]	[10]	12"
#5	[16]	[15]	14"
#6	[19]	[20]	16"
#7	[22]	—	16"
#8	[25]	[25]	16"
#9	[29]	[30]	16"
#10	[32]	—	16"
#11	[36]	[35]	16"

NOTE: To be manufactured as Single End



**Note:** No. 4, 5 and 6 splicers, 18", 24" and 36" long will usually have a stamped metal plug to protect threads; all other sizes will have a plastic cap plug.

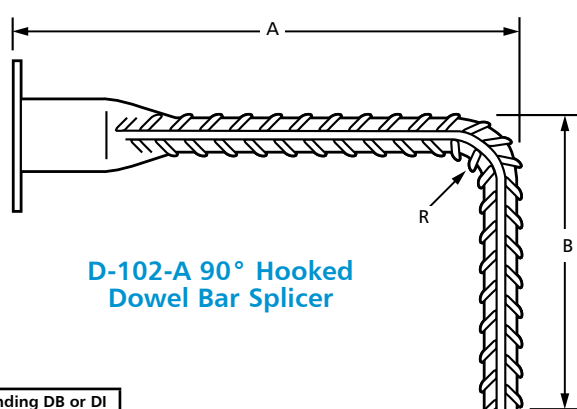
## Dowel Bar Splicer System

Specified or Required Dowel Bar						Recommended Dowel Bar Splicer and Dowel-In						
Bar Size			Grade 60 Rebar Loads (lbs.)			System Thread Size*	DB-SAE Bar Size	Dowel-In Bar Size	System Stress Area (min.)	Completed Splice (lbs.)		
US	Metric (mm)	CN (M)	P <sub>y</sub>	1.25 P <sub>y</sub>	P <sub>ult</sub>					P <sub>y</sub>	1.25 P <sub>y</sub>	Minimum P <sub>ult</sub> Range = 95% F <sub>u</sub> Actual or 160% F <sub>y</sub> Specified**
#4	[13]	[10]	12,000	15,000	18,000	5/8"-11	#4	#4	.20	12,000	15,000	19,200
#5	[16]	[15]	18,600	23,250	27,900	3/4"-10	#5	#5	.31	18,600	23,250	29,760
#6	[19]	[20]	26,400	33,000	39,600	7/8"-9	#6	#6	.44	26,400	33,000	42,400
#7	[22]	—	36,000	45,000	54,000	1"-8	#7	#7	.60	36,000	45,000	57,600
#8	[25]	[25]	47,400	59,250	71,100	1-1/8"-8	#8	#8	.79	47,400	59,250	75,840
#9	[29]	[30]	60,000	75,000	90,000	1-1/4"-8	#9	#9	1.00	60,000	75,000	96,000
#10	[32]	—	76,200	95,250	114,000	1-7/16"-8	#10	#10	1.27	76,200	95,250	121,920
#11	[36]	[35]	93,600	117,000	140,400	1-9/16"-8	#11	#11	1.56	93,600	117,000	149,760

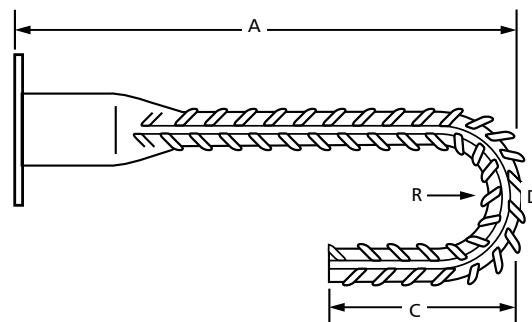
P<sub>y</sub>=Minimum Yield Strength of bar.

\*5/8", 3/4", 7/8" and 1" sizes have UNC Threads. 1-1/8" and larger sizes are equipped with UN Threads.

\*\*Loads shown based on 160% f<sub>y</sub> specified.



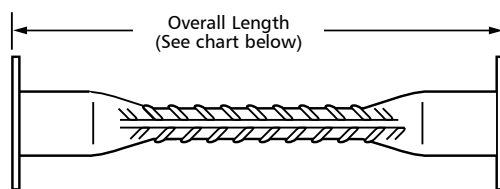
**D-102-A 90° Hooked Dowel Bar Splicer**



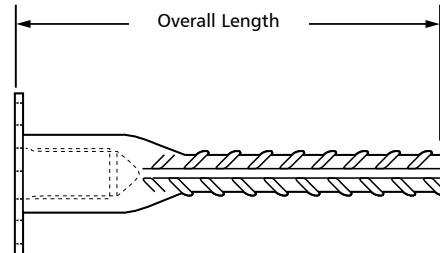
**D-103-A 180° Hooked Dowel Bar Splicer**

Bar Size Designation			Bending DB or DI 90° only Minimum "A" Dimension
US	Metric (mm)	CN (M)	
#4	[13]	[10]	4" *
#5	[16]	[15]	5" *
#6	[19]	[20]	6" *
#7	[22]	—	7" *
#8	[25]	[25]	8" *
#9	[29]	[30]	9" *
#10	[32]	—	10" *
#11	[36]	[35]	11" *

\* Tolerance on Bending Plus 0 / Minus 1" on "A" Dimension



**D-104-A Double-Ended Dowel Bar Splicer**



**D-101-A Dowel Bar Splicer**

Bar Size Designation			D-104-A Double-Ended Min. Lengths	Tolerance Overall Length
US	Metric (mm)	CN (M)		
#4	[13]	[10]	12" O.A.	+0 - 3/8"
#5	[16]	[15]	12" O.A.	+0 - 3/8"
#6	[19]	[20]	14" O.A.	+0 - 1/2"
#7	[22]	—	16" O.A.	+0 - 5/8"
#8	[25]	[25]	16" O.A.	+0 - 3/4"
#9	[29]	[30]	16" O.A.	+0 - 1"
#10	[32]	—	16" O.A.	+0 - 1"
#11	[36]	[35]	16" O.A.	+0 - 1"

\*\* Based on barrels forged on each end. For lengths less than minimum - please check with Tremont - we may supply forged DB one end, DI with Coupler and nailer washer other end.

See D-108 Headed Dowel Bar Splicer on page 17.

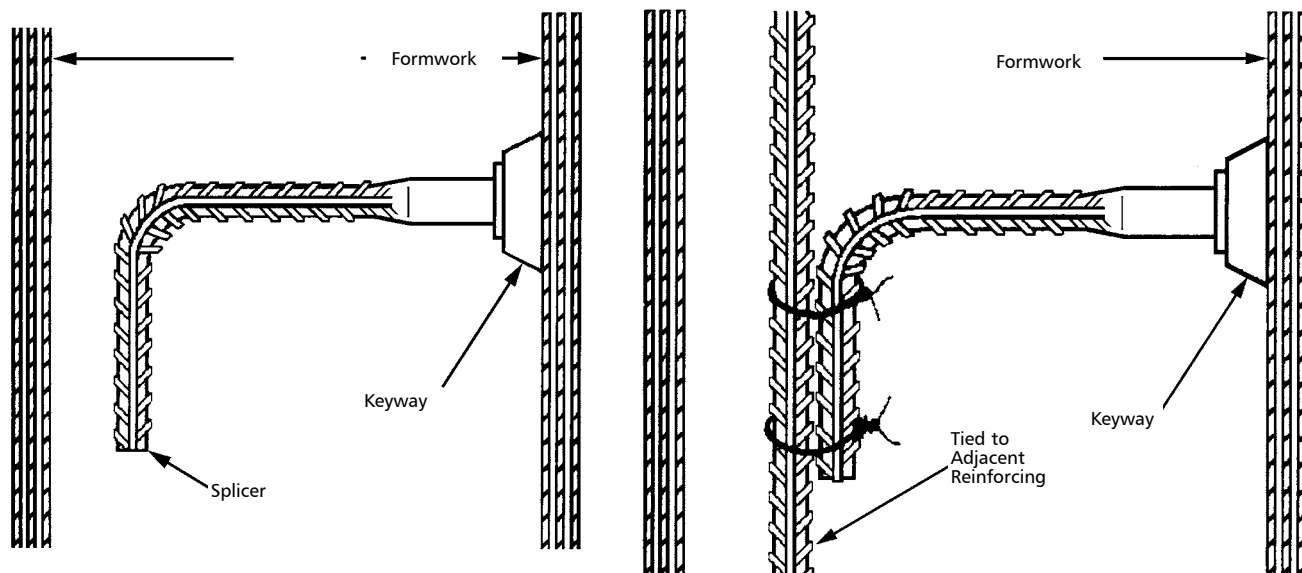
### To Order:

Specify: (1) quantity, (2) name, (3) bar size (should be equivalent to the rebar being substituted for on the structural drawings), (4) dimensions required.

### Example:

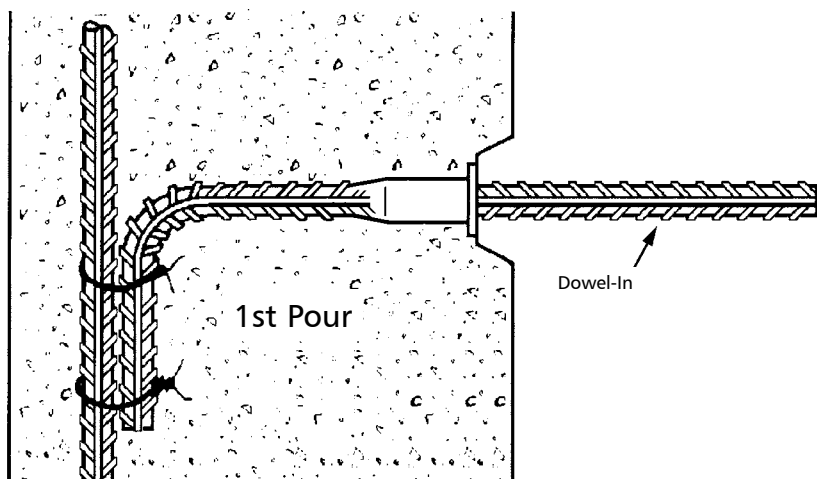
600, D-101-A Dowel Bar Splicers, #5 rebar, 36" long.

## Typical Dowel Bar Splicer System Installation

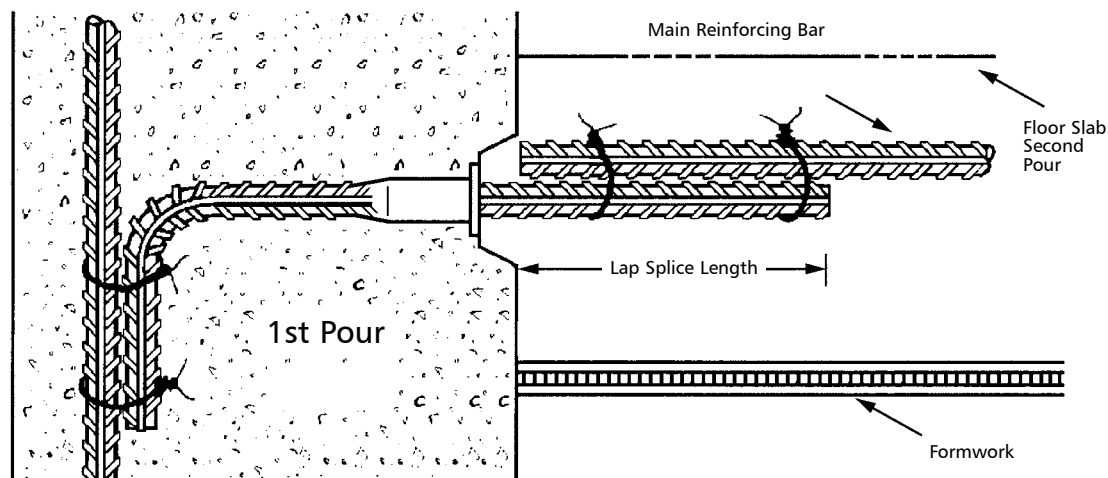


1. Set forms, and nail or screw Splicer to form key.

2. Place required reinforcing steel.



3. After first pour has properly set, remove the formwork and screw Dowel-Ins into the exposed splicers.



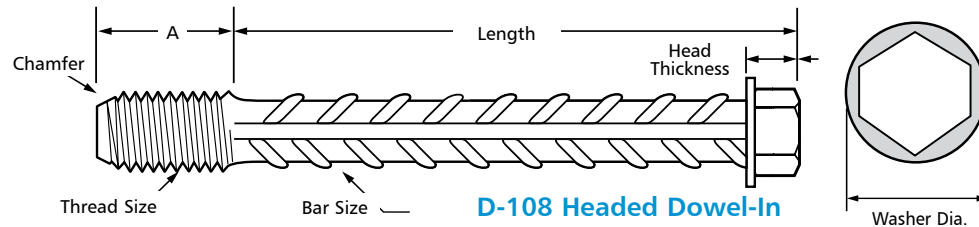
4. Place second pour formwork and reinforcing steel.



## Dowel Bar Splicer System

### D-108 Headed Dowel-In

The Dayton Superior D-108 Headed Dowel-In is a length of grade 60 deformed rebar with one end enlarged by forging and then threaded, and the other end forged into a bolt head configuration. The D-108 Headed Dowel-In is designed for use in congested areas where hooked dowel-ins cannot be utilized. D-108 Dowel-In is available in plain or epoxy coated finish. Standard length of D-108 is 12 times the bar diameter. Other lengths available on request.



Bar Size Designation			Thread Size	A	Width Across Flats	Washer Diameter	Head Thickness	Ultimate Strength
US	Metric (mm)	CN (M)						
#4	[13]	[10]	5/8"-11 UNC	7/8"	—	—	—	18,000 lbs.
#5	[16]	[15]	3/4"-10 UNC	1"	7/8"	1-3/16"	7/16"	27,900 lbs.
#6	[19]	[20]	7/8"-9 UNC	1-1/8"	1-1/16"	1-1/2"	7/16"	39,600 lbs.
#7	[22]	—	1"-8 UNC	1-1/4"	1-5/16"	1-3/4"	9/16"	54,000 lbs.
#8	[25]	[25]	1-1/8"-8 UN	1-3/8"	1-5/16"	1-3/4"	9/16"	71,100 lbs.
#9	[29]	[30]	1-1/4"-8 UN	1-1/2"	1-3/4"	2-1/8" - 2-1/4"	3/4"	90,000 lbs.
#10	[32]	—	1-7/16"-8 UN	1-11/16"	1-3/4"	2-1/8" - 2-1/4"	3/4"	114,300 lbs.
#11	[36]	[35]	1-9/16"-8 UN	1-13/16"	2-1/16"	2-1/2" - 2-5/8"	7/8"	140,400 lbs.

\*Ultimate strength based on 160%  $f_y$  specified.

Bar Size Designation			D-108 Minimum Length Hex Head Dowel In
US	Metric (mm)	CN (M)	
#4	[13]	[10]	6" **
#5	[16]	[15]	6" **
#6	[19]	[20]	6" **
#7	[22]	—	6" **
#8	[25]	[25]	10" **
#9	[29]	[30]	10" **
#10	[32]	—	12" **
#11	[36]	[35]	12" **

\*\* Plus Thread

#### To Order:

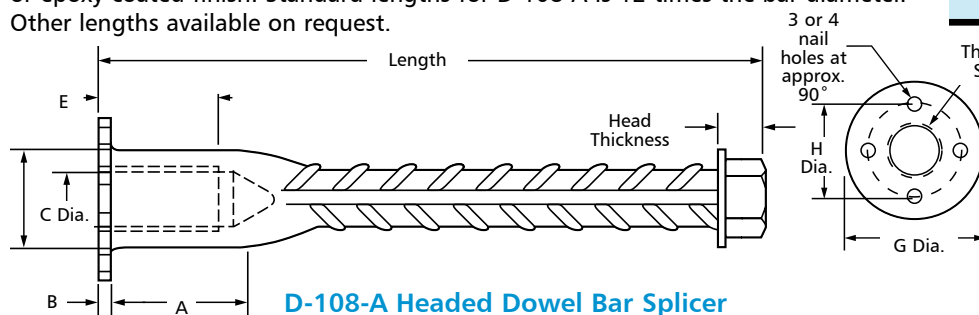
Specify: (1) quantity, (2) name, (3) bar size, (4) length.

#### Example:

500, D-108 Headed Dowel-Ins, #6 rebar x 12" long.

### D-108-A Headed Dowel Bar Splicer

The Dayton Superior D-108-A Headed Dowel Bar Splicer is designed to help ease hooked rebar congestion. It has excellent anchorage capacities and can be used for common structural anchoring, such as one-sided forming, light standard support, signs, posts, etc. The D-108-A Splicers are available in sizes #4 through #11 in plain or epoxy coated finish. Standard lengths for D-108-A is 12 times the bar diameter. Other lengths available on request.



#### To Order:

Specify: (1) quantity, (2) name, (3) bar size, (4) length.

#### Example:

500, D-108-A Headed Dowel Bar Splicer, #5 rebar x 9" long.

Bar Size Designation			Thread Size	A	B	C	D	E	Width Across Flats	Washer Diameter	Head Thickness	Ultimate Strength
US	Metric (mm)	CN (M)										
#4	[13]	[10]	5/8"-11 UNC	1-1/8"	1/8"	11/16"	55/64"	1"	1-1/16"	1-3/8"	1/2"	18,000 lbs.
#5	[16]	[15]	3/4"-10 UNC	1-9/16"	1/8"	13/16"	1-3/64"	1-1/8"	1-5/16"	1-5/8"	1/2"	27,900 lbs.
#6	[19]	[20]	7/8"-9 UNC	1-11/16"	1/8"	15/16"	1-15/64"	1-1/4"	1-5/16"	1-5/8"	5/8"	39,600 lbs.
#7	[22]	—	1"-8 UNC	1-27/32"	1/8"	1-1/16"	1-27/64"	1-3/8"	1-3/8"	1-7/8"	5/8"	54,000 lbs.
#8	[25]	[25]	1-1/8"-8 UN	2-1/16"	1/8"	1-3/16"	1-19/32"	1-1/2"	1-3/8"	1-7/8"	5/8"	71,100 lbs.
#9	[29]	[30]	1-1/4"-8 UN	2-3/16"	1/8"	1-5/16"	1-25/32"	1-5/8"	1-3/4"	2-1/8" - 2-1/4"	3/4"	90,000 lbs.
#10	[32]	—	1-7/16"-8 UN	2-7/16"	1/8"	1-1/2"	2"	1-13/16"	1-3/4"	2-1/8" - 2-1/4"	3/4"	114,300 lbs.
#11	[36]	[35]	1-9/16"-8 UN	2-9/16"	1/8"	1-5/8"	2-7/32"	1-15/16"	2-1/16"	2-1/2" - 2-5/8"	7/8"	140,400 lbs.

\*Ultimate strength based on 160%  $f_y$  specified.

## ICC ES Cyclic Test Averages for Dowel Bar Splicer System

ICC Evaluation Report No. 4028

Bar Size			Bar Area sq. in.	Cyclic Load Levels (Stages 1, 2, 3)				Tensile Strength (Stage 4)		
US	Metric (mm)	CN (M)		P <sub>min</sub> (kips)	P <sub>max</sub> <sup>1</sup> (kips)	P <sub>max</sub> <sup>2</sup> (kips)	P <sub>max</sub> <sup>3</sup> (kips)	(kips)	ksi	%f <sub>y</sub>
#4	[13]	[10]	0.20	-6.0	11.4	13.12	13.76	20.08	100.42	167.2
#5	[16]	[15]	0.31	-9.3	17.7	21.9	22.18	30.23	97.5	162.4
#6	[19]	[20]	0.44	-13.2	25.1	31.58	32.36	45.01	102.3	170.4
#7	[22]	—	0.60	-18.0	34.2	41.68	44.6	60.24	100.42	167.4
#8	[25]	[25]	0.79	-23.7	45.0	48.42	55.74	79.64	100.84	168.0
#9	[29]	[30]	1.00	-30.0	57.0	66.52	66.84	95.66	95.66	159.2

**Note:** The above are average values derived from tests performed by Wiss, Janney, Elstner Associates, Inc. in accordance with ICC's acceptance criteria AC-133. All bars met ICC's Type 2 Splice Requirements.

**Note:** One kip = 1,000 pounds.

## D-110 US/MC-SAE Coupler Splice System\*

### ICC Evaluation

#### Report No. 5216

The Dayton Superior D-110 US/MC-SAE Coupler Splice System is suitable for splicing reinforcement bars end to end. The mechanical connections accommodate bar sizes #4 through #18 and are a convenient alternative to lap splices and/or butt welding. Typical applications include splicing rebar in vertical column cages, monolithic structures, etc.

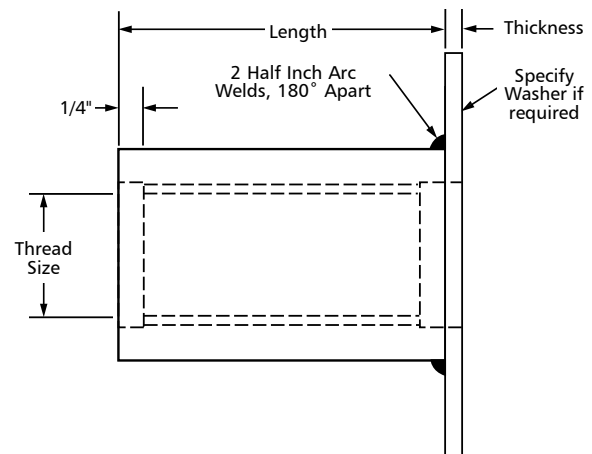
The standard coupler's heavy wall design is manufactured from high quality steel and is tested in accordance with ACI, AASHTO and ASTM standards. The coupler is designed to achieve 160% of the specified yield (full mechanical ultimate) of the bar.

The D-110 coupler employs the attributes of the Dowel-In's upset, upsized thread to achieve a strong, straight-line mechanical splice. Dowel-Ins or D-115 Inertia Splice Bars are threaded into the heavy duty coupler's body to complete the splice. The D-110 coupler is also available with an optional washer face, if required.

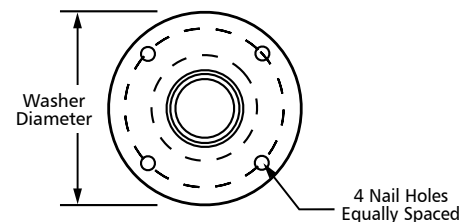
A unique advantage of the D-110 US/MC-SAE Coupler is that the coupler can be advanced beyond the threaded region of the splice bar and then, after butting the two bars, can be back-threaded onto the second bar to complete the splice without having to turn the bars.

D-110 US/MC-SAE Coupler Splice System									
Product code w/out Washer	Product Code with Washer	Bar Size Designation			Thread Size	Couple O.D.	Coupler Length	Washer Diameter (Optional)	Coupler Ultimate Strength**
		US	Metric (mm)	CN (M)					
123179	123187	#4	[13]	[10]	5/8"-11 UNC	1"	2-1/4"	1-3/4"	19,200 lbs.
123180	123188	#5	[16]	[15]	3/4"-10 UNC	1-1/8"	2-1/2"	2-1/4"	27,960 lbs.
111480	123189	#6	[19]	[20]	7/8"-9 UNC	1-1/4"	2-3/4"	2-1/2"	42,240 lbs.
111490	123190	#7	[22]	—	1"-8 UNC	1-1/2"	3"	2-1/2"	57,600 lbs.
111500	123191	#8	[25]	[25]	1-1/8"-8 UN	1-5/8"	3-1/4"	2-3/4"	75,840 lbs.
111520	123192	#9	[29]	[30]	1-1/4"-8 UN	1-7/8"	3-1/2"	3"	96,000 lbs.
111530	123193	#10	[32]	—	1-7/16"-8 UN	2-1/4"	3-7/8"	3-1/2"	121,920 lbs.
111540	123194	#11	[36]	[35]	1-9/16"-8 UN	2-3/8"	4-1/8"	3-3/4"	149,760 lbs.
111560	123195	#14	[43]	[45]	1-7/8"-8 UN	2-3/4"	5-1/4"	4-1/4"	216,000 lbs.
111570	123196	#18	[57]	[55]	2 1/2"-8 UN	3-5/8"	6-1/2"	5"	384,000 lbs.

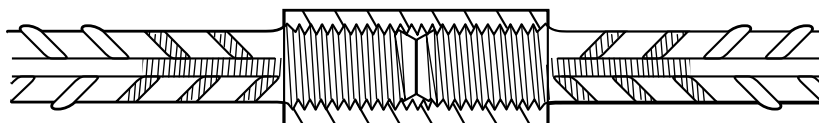
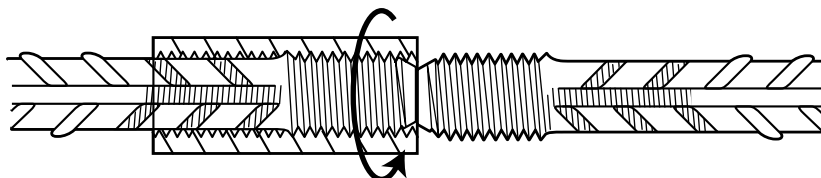
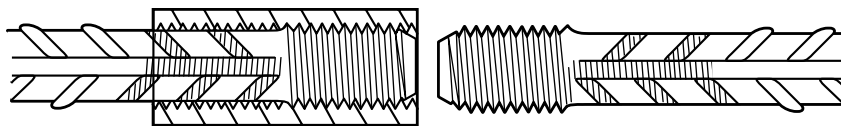
\*\*Ultimate strength based on 160%  $f_y$  specified.



**D-110 US/MC-SAE Coupler Shown With Optional Washer Face**



\*U.S. Patent No. 5,152,118



**Standard Coupler Splice**

#### To Order:

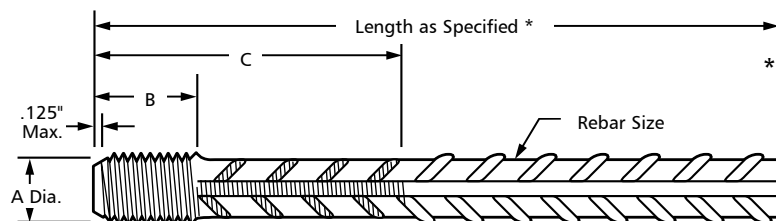
Specify: (1) quantity, (2) name, (3) bar size.

#### Example:

300, D-110 US/MC-SAE Couplers for #14 rebar.

## D-111 US/MC-SAE Standard Threaded Splice Bar

The Dayton Superior D-111 US/MC-SAE Standard Threaded Splice Bar is manufactured from grade 60 deformed rebar material, with an upsized threaded end that provides the bar with a cross-sectional area greater than the original bar. This ensures that there will be no reduction of bar strength due to the threading operation. The standard D-111 Splice Bar is available in sizes #4 through #18 in plain or epoxy coated finish.



\* **Note:** D-111 Splice Bars are measured overall. Available with or without overhead ("C" dimension).

**D-111 US/MC-SAE Standard Threaded Splice Bar**

Bar Size Designation			Thread Size	A	B	C
US	Metric (mm)	CN (M)				
#4	[13]	[10]	5/8"-11 UNC	5/8"	7/8"	2 1/8"
#5	[16]	[15]	3/4"-10 UNC	3/4"	1"	2-1/4"
#6	[19]	[20]	7/8"-9 UNC	7/8"	1-1/8"	2-1/2"
#7	[22]	—	1"-8 UNC	1"	1-1/4"	2-3/4"
#8	[25]	[25]	1-1/8"-8 UN	1-1/8"	1-3/8"	3"
#9	[29]	[30]	1-1/4"-8 UN	1-1/4"	1-1/2"	3-1/4"
#10	[32]	—	1-7/16"-8 UN	1-7/16"	1-11/16"	3-5/8"
#11	[36]	[35]	1-9/16"-8 UN	1-9/16"	1-13/16"	3-7/8"
#14	[43]	[45]	1-7/8"-8 UN	1-7/8"	2-1/8"	5"
#18	[57]	[55]	2 1/2"-8 UN	2-1/2"	2-3/4"	6-1/4"

### To Order:

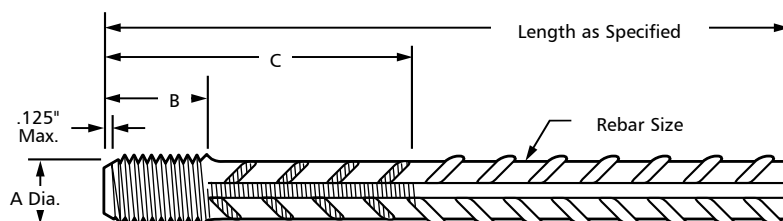
Specify: (1) quantity, (2) name, (3) bar size, (4) length.

### Example:

1,200, D-111 US/MC-SAE Standard Threaded Splice Bars, #7 x 10' long.

## D-112 US/MC-SAE Extended Thread Splice Bar

The Dayton Superior D-112 US/MC-SAE Extended Thread Splice Bars are similar to the standard bar, except for the lengthened threaded end section. The extended length of the threaded end, plus two locking nuts, allows the bar to be utilized for position coupler applications.



**D-112 US/MC-SAE Extended Thread Splice Bar**

Bar Size Designation			Thread Size	A	B	C
US	Metric (mm)	CN (M)				
#6	[19]	[20]	7/8"-9 UNC	7/8"	2"	3-1/8"
#7	[22]	—	1"-8 UNC	1"	2-1/4"	3-3/8"
#8	[25]	[25]	1-1/8"-8 UN	1-1/8"	2-3/8"	3-3/4"
#9	[29]	[30]	1-1/4"-8 UN	1-1/4"	2-5/8"	4-1/8"
#10	[32]	—	1-7/16"-8 UN	1-7/16"	3"	4-5/8"
#11	[36]	[35]	1-9/16"-8 UN	1-9/16"	3-1/8"	4-7/8"
#14	[43]	[45]	1-7/8"-8 UN	1-7/8"	3-7/8"	6-1/4"
#18	[57]	[55]	2 1/2"-8 UN	2-1/2"	5"	8"

**Note:** D-112 Splice Bars are measured overall. Available with or without overhead ("C" dimension).

### To Order:

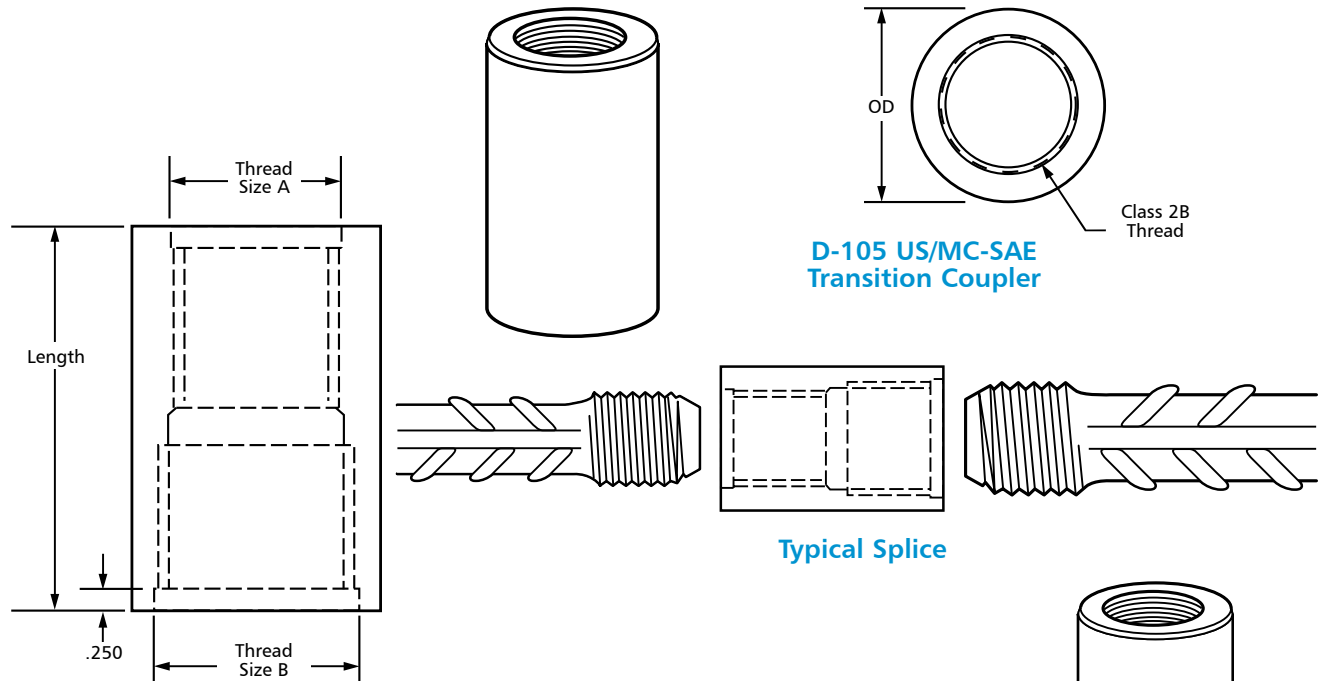
Specify: (1) quantity, (2) name, (3) bar size, (4) length.

### Example:

300 D-112 US/MC-SAE Extended Thread Splice Bars, #7 bars x 20' long.

## D-105 US/MC-SAE Transition Coupler

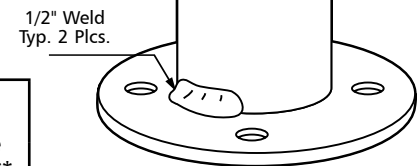
The Dayton Superior D-105 US/MC-SAE Transition Coupler is used to provide a mechanical connection of two threaded rebar of different diameters. The D-105 coupler is designed to achieve 160%  $f_y$  of the smaller bar. See the chart for standard sizes. The D-105 coupler can be furnished with or without a mounting washer and can be special-ordered in other than standard sizes.



**D-105 US/MC-SAE Transition Coupler**

Rebar Size Size			Thread Size		Coupler		Coupler Ultimate Strength**
US	Metric (mm)	CN (M)	A	B	O.D.	Length	
#4-#5	[13-16]	[10-15]	5/8"-11 UNC	3/4"-10 UNC	1-1/8"	2-5/8"	19,200 lbs.
#5-#6	[16-19]	[15-20]	3/4"-10 UNC	7/8"-9 UNC	1-1/4"	2-7/8"	29,760 lbs.
#6-#7	[19-22]	—	7/8"-9 UNC	1"-8 UNC	1-1/2"	3-1/8"	42,240 lbs.
#7-#8	[22-25]	—	1"-8 UNC	1-1/8"-8 UN	1-5/8"	3-3/8"	57,600 lbs.
#7-#9	[22-29]	—	1"-8 UNC	1-1/4"-8 UNC	1-7/8"	3-1/2"	57,600 lbs.
#8-#9	[25-29]	[25-30]	1-1/8"-8 UN	1-1/4"-8 UN	1-7/8"	3-5/8"	75,840 lbs.
#8-#10	[25-32]	—	1-1/8"-8 UN	1-7/16"-8 UN	2-1/4"	3-7/8"	75,840 lbs.
#9-#10	[29-32]	—	1-1/4"-8 UN	1-7/16"-8 UN	2-1/4"	4"	96,000 lbs.
#9-#11	[29-36]	[30-35]	1-1/4"-8 UN	1-9/16"-8 UN	2-3/8"	4-1/8"	96,000 lbs.
#10-#11	[32-36]	—	1-7/16"-8 UN	1-9/16"-8 UN	2-3/8"	4-1/4"	121,920 lbs.
#10-#14	[32-43]	—	1-7/16"-8 UN	1-7/8"-8 UN	2-3/4"	4-5/8"	121,920 lbs.
#11-#14	[36-43]	[35-45]	1-9/16"-8 UN	1-7/8"-8 UN	2-3/4"	4-3/4"	149,760 lbs.
#11-#18	[36-57]	[35-55]	1-9/16"-8 UN	2-1/2"-8 UN	3-5/8"	5-3/8"	149,760 lbs.
#14-#18	[43-57]	[45-55]	1-7/8"-8 UN	2 1/2"-8 UN	3-5/8"	5-5/8"	216,000 lbs.

\*\* Ultimate strength based on 160%  $f_y$  specified.



**Optional Mounting Washer**

### To Order:

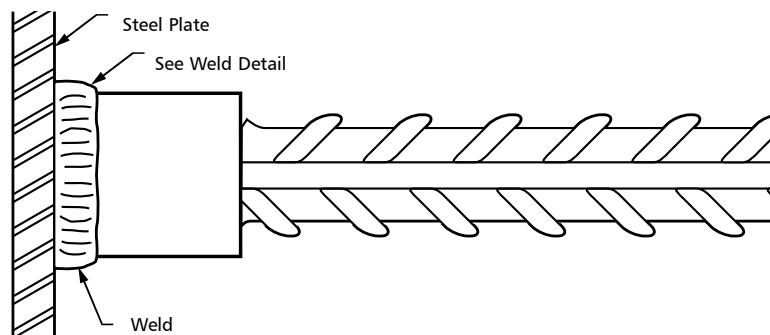
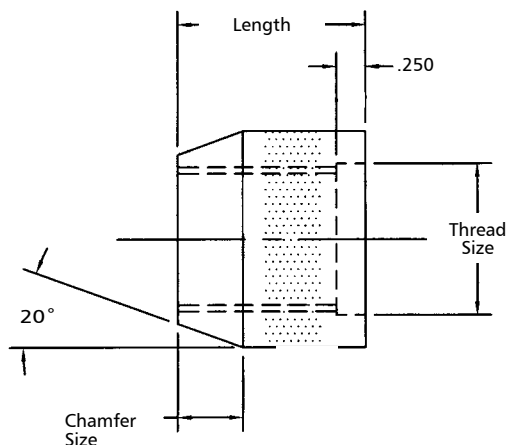
Specify: (1) quantity, (2) name, (3) rebar sizes, (4) flange information.

### Example:

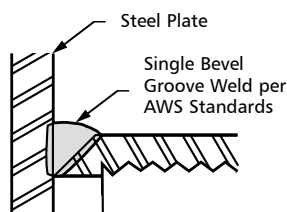
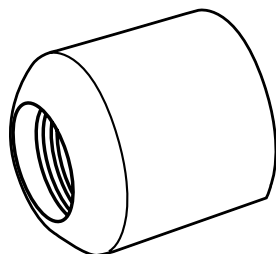
250, D-105 US/MC SAE Transition Couplers, #6 to #7 rebar without mounting flanges.

## D-106 US/MC-SAE Welding Half Coupler

The Dayton Superior D-106 US/MC-SAE Welding Half Coupler provides a method of connecting rebar to structural steel members, such as piles, weld plates, beams, columns, etc. The D-106 coupler is fabricated from steel meeting ASTM A108 grade 1018 or 1020 and is designed to allow maximum weld capacity. Successful welds can be produced at the job site, providing that good welding practices are maintained.



**Note:** Designed to be used with single bevel groove weld (types) SMAW, GMAW or FCAW. Reference American Welding Society Standard, ANSI/ASW D1.1



**Weld Detail**

**D-106 US/MC-SAE  
Welding Half  
Coupler**

### To Order:

Specify: (1) quantity, (2) name, (3) rebar size.

### Example:

150, D-106 US/MC-SAE Welding Half Couplers for #8 rebar.

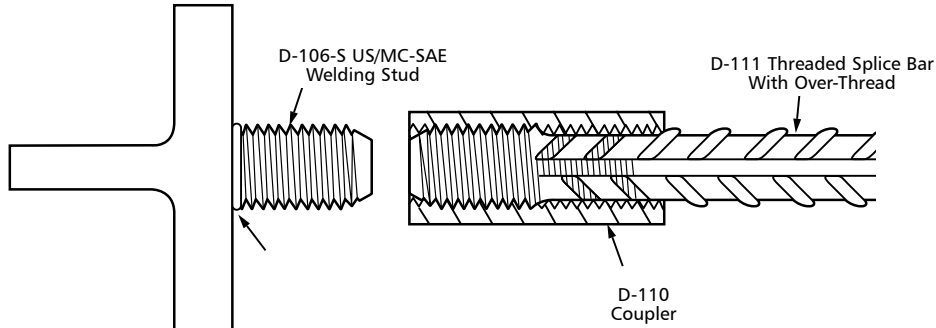
**D-106 US/MC-SAE Welding Half Coupler**

Product Code	Bar Size Designation			Thread Size	Coupler O.D.	Coupler Length	Chamfer Size	Coupler Ultimate Strength**
	US	Metric (mm)	CN (M)					
77714	#4	[13]	[10]	5/8" -11 UNC	1 -1/4"	1-1/8"	1/4"	19,200 lbs.
77715	#5	[16]	[15]	3/4" -10 UNC	1 -1/4"	1-1/4"	1/4"	29,760 lbs.
77716	#6	[19]	[20]	7/8" -9 UNC	1 -1/4"	1-3/8"	3/8"	42,240 lbs.
77717	#7	[22]	—	1"-8 UNC	1-1/2"	1-1/2"	3/8"	57,600 lbs.
77718	#8	[25]	[25]	1-1/8"-8 UN	1-5/8"	1-5/8"	1/2"	75,840 lbs.
77719	#9	[29]	[30]	1-1/4"-8 UN	1-7/8"	1-3/4"	9/16"	96,000 lbs.
77720	#10	[32]	—	1-7/16"-8 UN	2-1/4"	1-15/16"	5/8"	121,920 lbs.
77721	#11	[36]	[35]	1-9/16"-8 UN	2-3/8"	2-1/16"	3/4"	149,760 lbs.
	#14	[43]	[45]	1-7/8"-8 UN	2-3/4"	2-3/8"	15/16"	216,000 lbs.
	#18	[57]	[55]	2 1/2"-8 UN	3-5/8"	3"	1-1/8"	384,000 lbs.

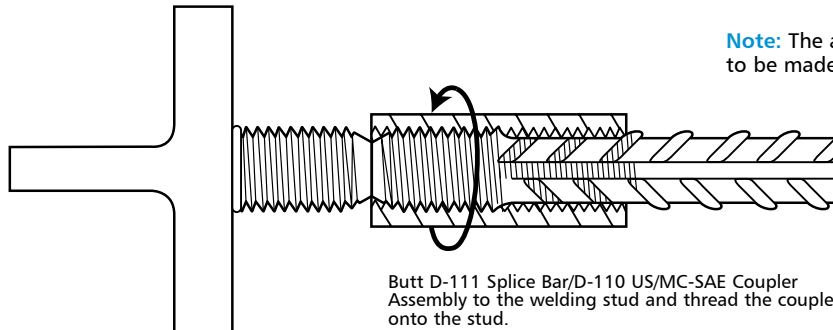
\*\* Actual ultimate strength depends on the strength of the field weld and the material to which the coupler is welded.  
Ultimate strength based on 160%  $f_y$  specified

## D-106-S US/MC-SAE Welding Stud

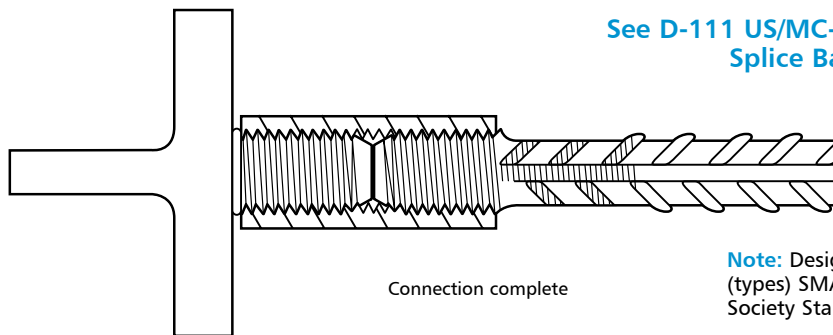
The Dayton Superior D-106-S US/MC-SAE Welding Stud is available to provide an alternate method of connecting rebar to structural steel members. The D-106-S Welding Stud is fabricated from ASTM A108 grade 1035 steel.



**Note:** The application shown allows the connection to be made without turning the rebar.



See D-111 US/MC-SAE Standard Threaded Splice Bar on page 20.



**Note:** Designed to be used with multiple bevel groove weld (types) SMAW, GMAW or FCAW. Reference American Welding Society Standard, ANSI/ASW D1.1

Bar Size Designation			Thread Size	Length (in.)	Chamfer Size (in.)	Stud Ultimate Strength*
US	Metric (mm)	CN (M)				
#4	[13]	[10]	5/8"-11 UNC	1-1/2"	1/4"	19,200 lbs.
#5	[16]	[15]	3/4"-10 UNC	1-5/8"	1/4"	29,760 lbs.
#6	[19]	[20]	7/8"-9 UNC	1-7/8"	3/8"	42,240 lbs.
#7	[22]	—	1"-8 UNC	2"	3/8"	57,600 lbs.
#8	[25]	[25]	1-1/8"-8 UN	2-1/4"	1/2"	75,890 lbs.
#9	[29]	[30]	1-1/4"-8 UN	2-1/2"	9/16"	96,000 lbs.
#10	[32]	—	1-7/16"-8 UN	2-3/4"	5/8"	121,920 lbs.
#11	[36]	[35]	1-9/16"-8 UN	3"	3/4"	149,760 lbs.
#14	[43]	[45]	1-7/8"-8 UN	3-3/8"	7/8"	216,000 lbs.
#18	[57]	[55]	2-1/2"-8 UN	4-1/4"	1-1/8"	384,000 lbs.

\*Actual ultimate strength depends on the strength of the field weld and the material to which the coupler is welded.  
Ultimate Strengths shown are based on 160%  $f_y$  specified.

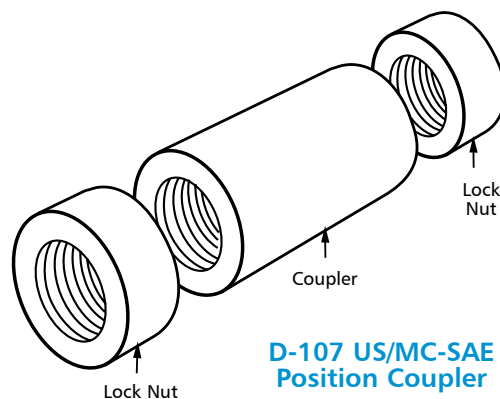
**To Order:**  
Specify: (1) quantity,  
(2) name, (3) rebar sizes.

**Example:**  
200, D-106-S US/MC-SAE  
Welding Stud, #8 rebar.

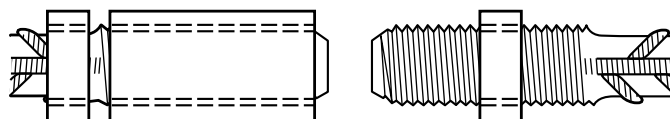
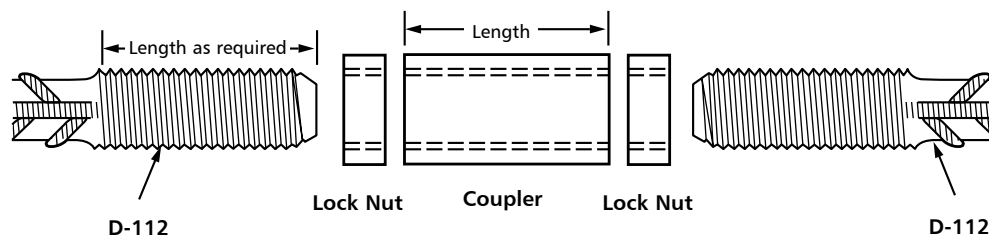
## D-107 US/MC-SAE Position Coupler

The Dayton Superior D-107 US/MC-SAE Position Coupler provides a means to splice reinforcing steel without having to turn the rebar. In places with little working space or heavy rebar congestion, the D-107 coupler offers an efficient splicing alternative. D-107 couplers are available for standard splices (bars of equal size) and transition splices (bars of unequal sizes).

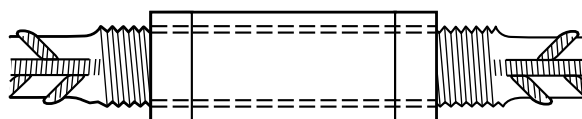
To ensure adequate thread length, the D-107 Position Coupler requires the D-112 Extended Thread Splice Bar on page 20.



**D-107 US/MC-SAE Position Coupler**



Lock nut and coupler are threaded completely onto one bar.  
Thread lock nut onto second bar.



Butt the bars together and reverse thread coupler onto second bar.  
Thread lock nuts to coupler and tighten nuts.

### To Order:

Specify (1) quantity, (2) name, (3) bar size(s).

### Example:

500, D-107 US/MC-SAE Position Couplers for #6 rebar.

### D-107 US/MC-SAE Position Coupler Dimensions

Bar Size Designation			Thread Size	Coupler O.D.	Coupler Length	Locknut Length	Coupler Ultimate Strength**
US	Metric (mm)	CN (M)					
#4	[13]	[10]	5/8"-11 UNC	1"	2-1/4"	13/32"	19,200 lbs.
#5	[16]	[15]	3/4"-10 UNC	1-1/8"	2-1/2"	1/2"	27,960 lbs.
#6	[19]	[20]	7/8"-9 UNC	1-1/4"	2-3/4"	19/32"	42,240 lbs.
#7	[22]	—	1"-8 UNC	1-1/2"	3"	11/16"	57,600 lbs.
#8	[25]	[25]	1-1/8"-8 UN	1-5/8"	3-1/4"	3/4"	75,840 lbs.
#9	[29]	[30]	1-1/4"-8 UN	1-7/8"	3-1/2"	27/32"	96,000 lbs.
#10	[32]	—	1-7/16"-8 UN	2-1/4"	3-7/8"	31/32"	121,920 lbs.
#11	[36]	[35]	1-9/16"-8 UN	2-3/8"	4-1/8"	1-1/16"	149,760 lbs.
#14	[43]	[45]	1-7/8"-8 UN	2-3/4"	5-1/4"	1-1/4"	216,000 lbs.
#18	[57]	[55]	2 1/2"-8 UN	3-5/8"	6-1/2"	1-11/16"	384,000 lbs.

\*Ultimate Strength based on 160%  $f_y$  specified.



## ICC ES Cyclic Test Averages on Dayton Superior US/MC Splices

ICC Evaluation Report No. 5216

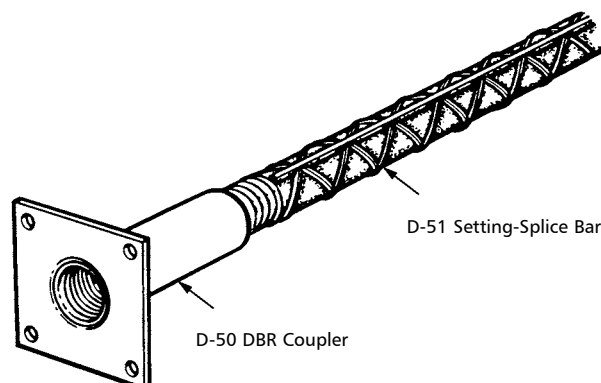
Bar Size Designation			Bar Area (sq. in.)	Cyclic Load Levels (Stages 1,2,3)				Tensile Strength (Stage 4)		
US	Metric (mm)	CN (M)		P <sub>min</sub> (kips)	P <sub>max1</sub> (kips)	P <sub>max2</sub> (kips)	P <sub>max3</sub> (kips)	(kips)	(ksi)	%f <sub>y</sub>
#4	[13]	[10]	0.20	-6.0	11.4	12.14	12.92	19.79	99.00	164.8%
#5	[16]	[15]	0.31	-9.3	17.7	21.68	21.62	30.17	97.32	162.2%
#6	[19]	[20]	0.44	-13.2	25.1	26.20	27.28	42.83	97.34	162.8%
#7	[22]	—	0.60	-18.0	34.2	42.08	43.88	60.64	100.94	168.2%
#8	[25]	[25]	0.79	-23.7	45.0	48.58	53.12	79.42	100.54	167.4%
#9	[29]	[30]	1.00	-30.0	57.0	65.54	69.84	95.20	95.54	159.2%
#10	[32]	—	1.27	-38.1	72.4	80.00	83.64	124.54	98.06	163.4%
#11	[36]	[35]	1.56	-46.8	88.9	102.96	103.00	149.02	95.52	159.2%
#14	[43]	[45]	2.25	-67.5	128.3	143.42	158.78	220.24	97.88	163.2%
#18	[57]	[55]	4.00	-120.0	228.0	259.3	287.2	395.3	98.7	165%

The above are average values derived from tests performed by Wiss, Janney, Elstner Associates, Inc. in accordance with ICC's acceptance criteria AC-133. All bars met ICC's Type 2 Splice Requirements.

**Note:** One kip = 1,000 pounds.

## D-50 DBR Coupler System

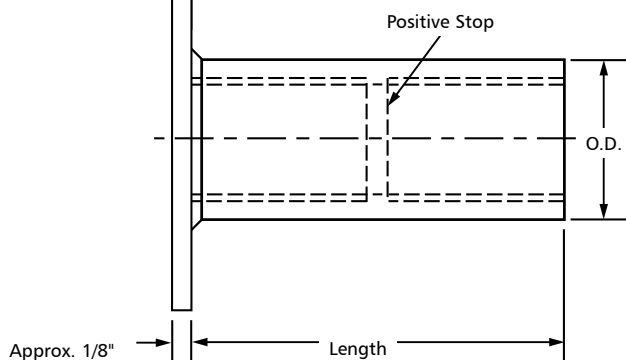
The DBR Couplers and DBR Setting/Splice Bars are simple, easy to use and familiar to all construction workers. The coupler is fastened to the formwork by nails, screws or a NC threaded bolt of proper diameter and length. The D-50 DBR Coupler splice meets or exceeds codes requiring 125%  $f_y$ .



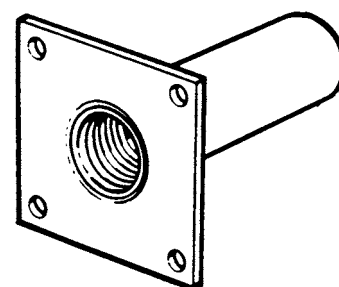
## D-50 DBR Coupler and DBR Setting/Splice Bars

The Dayton Superior D-50 DBR Coupler is fabricated from high quality steel satisfying ASTM A-108 and is tested in accordance with ACI, AASHTO and ASTM standards. DBR Couplers accommodate rebar sizes #4 through #11 and have an internal positive stop to ensure proper thread engagement. Refer to tables for additional specifications.

2" x 2" washer for  
DBR Bar Size #4  
through #9, 3"  
x 3" washer for  
DBR Bar Size #10  
and 11.



**D-50 DBR  
Coupler**



### To Order:

Specify: (1) quantity, (2) name, (3) rebar size

### Example:

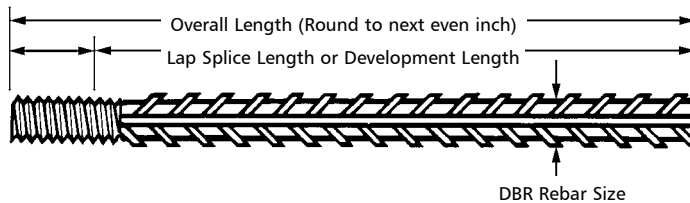
500 pcs., D-50 DBR Couplers, #8 rebar.

**D-50 DBR Coupler Selection Chart**

Product Code	Bar Size Designation			Thread Data	O.D. x Length
	US	Metric (mm)	CN (M)		
77098	#4	[13]	[10]	1/2" -13 UNC	3/4" x 1- 7/8"
77100	#5	[16]	[15]	5/8" - 11 UNC	7/8" x 2"
77110	#6	[19]	[20]	3/4" -10 UNC	1- 1/16" x 2- 3/8"
77120	#7	[22]	—	7/8" - 9 UNC	1- 1/4" x 2- 3/4"
77130	#8	[25]	[25]	1" - 8 UNC	1- 3/8" x 3- 1/8"
77140	#9	[29]	[30]	1 1/8" - 8 UN	1- 5/8" x 3- 5/8"
77142	#10	[32]	—	1 1/4" - 8 UN	1- 3/4" x 4- 1/8"
77144	#11	[36]	[35]	1 3/8" - 8 UN	1-15/16" x 4- 3/8"

**Note:** Threads on #9, #10 and #11 couplers are UN not NC.

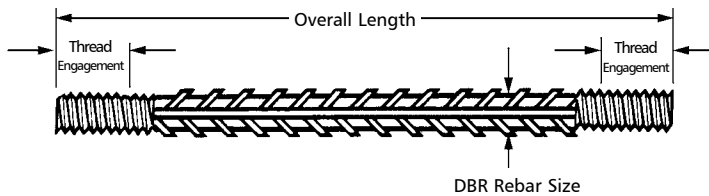
## D-51 DBR Straight Bar Threaded One End



D-51 Straight Bar Selection Chart

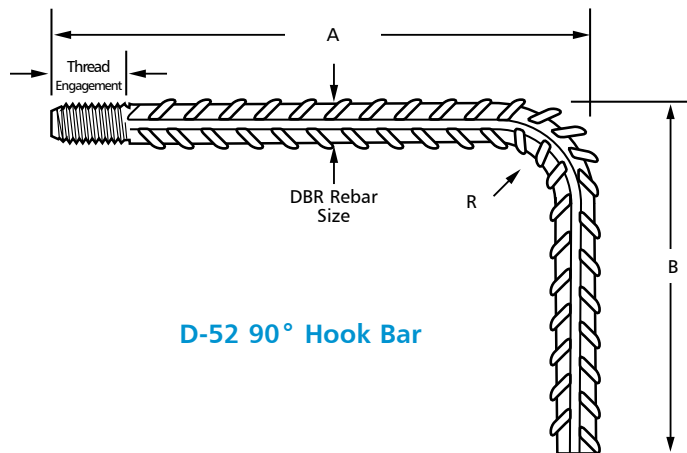
Bar Size Designation			Thread Data	A Thread Engagement
US	Metric (mm)	CN (M)		
#4	[13]	[10]	1/2"-13 UNC	3/4"
#5	[16]	[15]	5/8"-11 UNC	7/8"
#6	[19]	[20]	3/4"-10 UNC	1-1/16"
#7	[22]	—	7/8"- 9 UNC	1-1/4"
#8	[25]	[25]	1"- 8 UNC	1-7/16"
#9	[29]	[30]	1-1/8"- 8 UN	1-11/16"
#10	[32]	—	1-1/4"- 8 UN	1-15/16"
#11	[36]	[35]	1-3/8"- 8 UN	2-1/16"

## D-54 DBR Straight Bar Threaded Both Ends

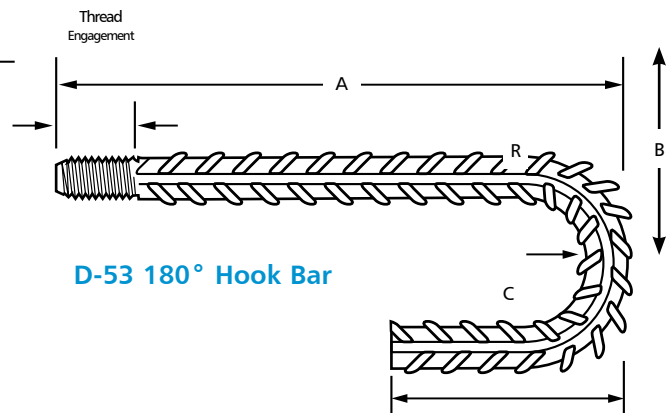


**Note:** Color coded removable plastic caps available on request.  
D-51 overall length is required length less one half of coupler length.  
D-54 overall length is required length less coupler length minus 5/16".

## D-52 DBR 90° Hook Bar and D-53 180° Hook Bar Threaded One End



D-52 90° Hook Bar



D-53 180° Hook Bar

D-52 and D-53 Hook Bar Selection Chart

Bar Size Designation			Thread Data	Thread Engagement	B* Standard For D-52	B Standard For D-53	D Standard For D-53	R Standard
US	Metric (mm)	CN (M)						
#4	[13]	[10]	1/2"-13 UNC	3/4"	4-1/2"	9-3/4"	4-1/2"	1-1/2"
#5	[16]	[15]	5/8"-11 UNC	7/8"	5-1/2"	12"	5"	1-7/8"
#6	[19]	[20]	3/4"-10 UNC	1-1/16"	7"	23"	6"	2-1/4"
#7	[22]	—	7/8"- 9 UNC	1-1/4"	8"	24"	7"	2-5/8"
#8	[25]	[25]	1"- 8 UNC	1-7/16"	9"	25"	8"	3"
#9	[29]	[30]	1-1/8"- 8 UN	1-11/16"	11"	31"	10-3/8"	4-3/4"
#10	[32]	—	1-1/4"- 8 UN	1-15/16"	12"	32"	11-5/8"	5-3/8"
#11	[36]	[35]	1-3/8"- 8 UN	2-1/16"	14"	33"	12-7/8"	6"

**Notes:** Color coded removable plastic caps available on request.

\*Based on "R" minimum as shown. Standard dimensions are to CRSI standard by pin size.

### To Order:

Specify: (1) quantity, (2) name, (3) bar size (4) dimension "B" (as specified on plans) (5) dimension "C" or "D" and (6) dimension "R"

### Example:

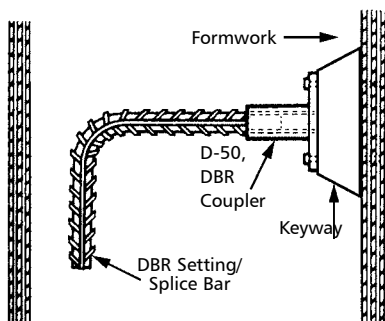
500 pcs., D-52 90° Hook Bar, #6, B=7", C=20", R=2"

D-52 and D-53 Hook Bar Selection Chart

Bar Size Designation			Reinforcing Bar Area (in <sup>2</sup> )	Minimum Yield (lbs.)	Minimum Ultimate (lbs.)	Thread Data	Thread Data		
US	Metric (mm)	CN (M)					Thread Tensile Stress Area (in <sup>2</sup> )	125% f <sub>y</sub> Minimum Requirement (lbs.)	Minimum Ultimate Tensile Stress (psi)
#4	[13]	[10]	0.20	12,000	18,000	1/2"-13 NC	0.1419	15,000	105,708
#5	[16]	[15]	0.31	18,600	27,900	5/8"-11 NC	0.226	23,250	102,876
#6	[19]	[20]	0.44	26,400	39,600	3/4"-10 NC	0.334	33,000	98,802
#7	[22]	—	0.60	36,000	54,000	7/8"-9 NC	0.462	45,000	97,403
#8	[25]	[25]	0.79	47,400	71,100	1"-8 UNC	0.606	59,250	97,772
#9	[29]	[30]	1.00	60,000	90,000	1-1/8"-8 UN	0.790	75,000	94,937
#10	[32]	—	1.27	76,200	114,300	1-1/4"-8 UN	1.000	95,250	95,250
#11	[36]	[35]	1.56	93,600	140,400	1-3/8"-8 UN	1.233	117,000	94,891
#14	[43]	[45]	2.25	135,000	202,500	1-5/8"-8 UN	1.780	168,750	94,803

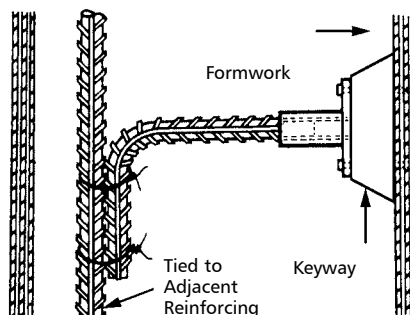
## How to Install the DBR Coupler System

### Step 1



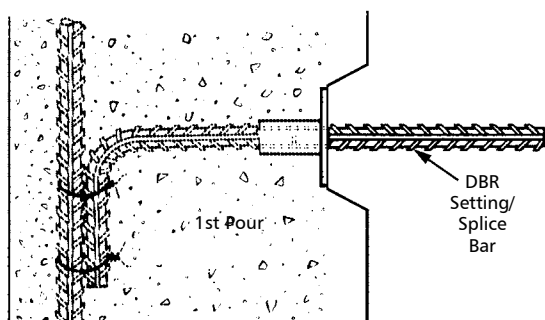
A DBR Setting/Splice Bar is threaded into the D-50 coupler until the positive thread stop is reached. The D-50 DBR coupler is then fastened to the formwork with nails, screws or bolts.

### Step 2



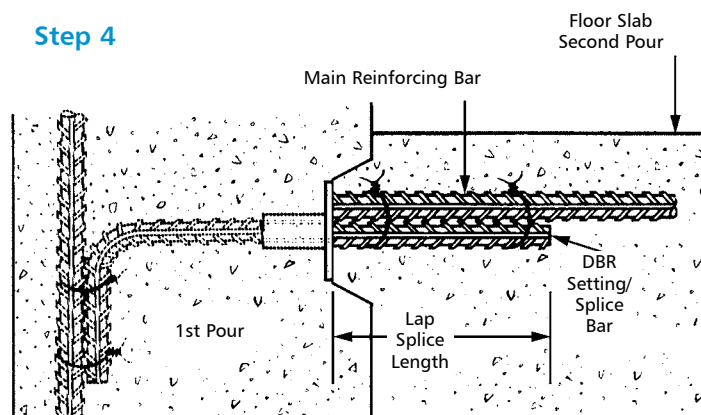
The DBR Setting/Splice Bar is tied off to adjacent reinforcing steel, for proper support during concrete placement as well as to maintain the required lap splice length.

### Step 3



After the formwork is stripped, a second DBR Setting/Splice Bar is threaded into the exposed end of the D-50 coupler until the stop is reached.

### Step 4



The DBR Setting/Splice bar is tied to the adjacent reinforcing steel maintaining the proper lap splice length. The dowel bar replacement is now complete, ready for final concrete placement.

## Why Taper-Lock is Better

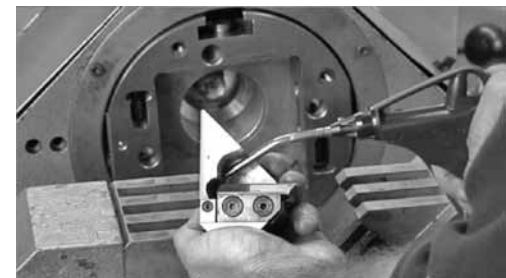
- ◆ ICC Evaluation Report ESR-2481
- ◆ Portable design allows you to take the system wherever you need it.
- ◆ Sharpen cutters up to three times for previously unheard of efficiency! Spend less money on new blades, and save your crew from unnecessary downtime.
- ◆ Revolutionary high-speed taper cut more than doubles the production of conventional cutters, allowing you to beat deadlines and reduce costs.
- ◆ No need to purchase any costly additional cutting fluids — simply use a conventional water-soluble cutting fluid.
- ◆ Strong unit withstands tough projects. Straightforward process makes operation and repair easy.

## Splice Rebar On-site, in a Fraction of the Time

You already rely on Bar-Lock® couplers from Dayton Superior — the company you trust is proud to offer the portable, high-speed taper cut solution! Turn the system that's already been proven on sites throughout Europe into your on-site advantage. Dayton Superior is the only company able to bring the reliable Taper-Lock design to North American fabricators and contractors.

## Use the Dayton Taper-Lock on Your Next Job Site

The compact design saves room in your fabrication shop or on the job with all the advantages and one-quarter the size of similar machines, it's time to re-think rebar splicing! Strength certification and test results are available upon request through the qualified Dayton Superior Dealer network throughout North America.



### TYPICAL SPECIFICATIONS:

#### Specific:

Mechanical connections shall be Taper-Lock® taper threaded couplers as manufactured by Dayton Superior Corp.

#### Generic:

The mechanical connection shall meet building code requirements of developing in tension and compression as required by \_\_\_\_\_ (insert name here). The mechanical connection shall be the positive locking, taper threaded type coupler manufactured from high quality steel. The bar ends must be taper threaded using the manufacturer's bar threading equipment to ensure proper taper and thread engagement. All couplers shall be installed per the manufacturer's approved procedures.

## D-310 TAPER-LOCK STANDARD COUPLER

### PRODUCT DESCRIPTION:

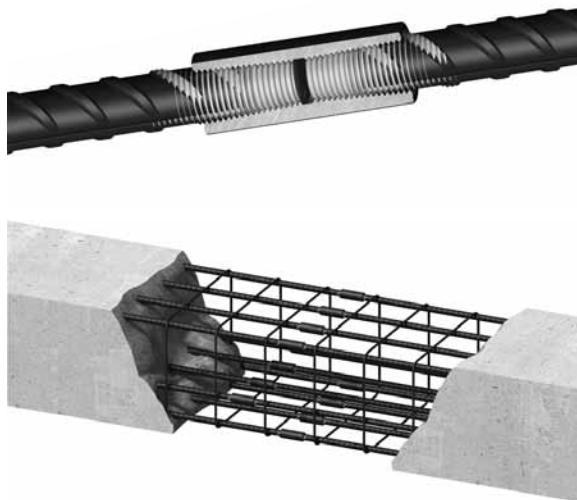
The D-310 Taper-Lock is used to join any bar-to-bar connection of the same size, where one bar can be rotated. This simplifies rebar splicing in areas where rebar congestion prevents the use of long lap splices. Engagement of the bar within the coupler is simplified by the taper thread which aids in alignment.

### PRODUCT FEATURES AND BENEFITS:

- Used in 80% of all connections
- The compact design of the coupler ensures suitability for use in confined situations where space is restricted or where the loss of cover must be minimized
- Reduces engineering design time
- Eliminates rebar congestion
- Provides Type 2 splicing capacities (160%  $F_y$ ) and simplifies load paths
- Meets approval from ICC (ESR 2481), ACI, CalTrans, IBC2006, and Ministries of Transportation for Ontario and Quebec
- Approved for use in fatigue applications

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Black, Epoxy or Hot-Dipped Galvanized
- Type 2 Splice (160% of  $F_y$ )
- Connect bars of the same size using an internal sleeve with two right hand tapered threads
- Each end must be tightened with calibrated torque wrench



### HOW TO ORDER:

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish
5. Made in USA requirement

#### EXAMPLE:

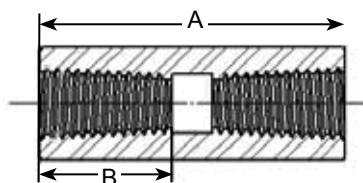
1. 500 pieces
2. D-310 Taper-Lock® Standard Coupler
3. #6
4. Black
5. Made in the USA not required

### PRODUCT CODES

Bar Size			Made in the USA (Black) ASTM A311 Grade 1144	Made in the USA (Epoxy) ASTM A311 Grade 1144	Made in the USA (Hot dipped Galvanized) ASTM A311 Grade 1144	(Black) ASTM A576 Grade 1045	(Epoxy) ASTM A576 Grade 1045
US	Metric (mm)	CN (m)					
#4	[13]	[10]	127020	127258	128037	126389	128322
#5	[16]	[15]	127021	127259	128038	126390	128323
#6	[19]	[20]	127022	127260	128039	126391	128324
#7	[22]	-	127023	127261	128040	126392	128325
#8	[25]	[25]	127024	127262	128041	126393	128326
#9	[29]	[30]	127025	127263	128042	126394	128327
#10	[32]	-	127026	127264	128043	126395	128328
#11	[36]	[35]	127027	127265	128044	126396	128329
#14	[43]	[45]	127028	127266	128045	126397	128330
#18	[57]	[55]	127019	127267	128046	126398	128331

### NOMINAL ENGAGEMENT

Bar Size			"A"		"B" (Nominal)	
US	Metric (MM)	CN (M)	US	(mm)	US	(mm)
#4	[13]	[10]	2.362	[60]	1.024	[26]
#5	[16]	[15]	2.756	[70]	1.221	[31]
#6	[19]	[20]	2.874	[73]	1.281	[32.5]
#7	[22]	-	3.189	[81]	1.399	[35.5]
#8	[25]	[25]	3.622	[92]	1.615	[41]
#9	[29]	[30]	4.016	[102]	1.812	[46]
#10	[32]	-	4.488	[114]	2.049	[52]
#11	[36]	[35]	4.921	[125]	2.246	[57.5]
#14	[43]	[45]	5.827	[148]	2.719	[69]
#18	[57]	[55]	7.638	[194]	3.625	[92]





## INSTALLATION: D-310 TAPER-LOCK STANDARD COUPLER

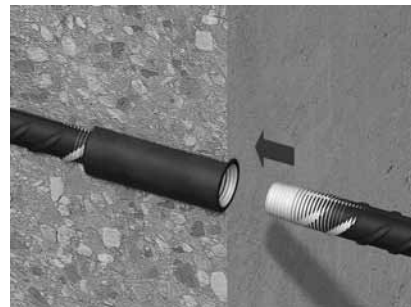
### STEP 1

The coupler is normally supplied fixed to the reinforcing bar, ready to be installed and cast in concrete.



### STEP 2

After casting the concrete and when ready to extend, remove the thread protector from the coupler. Position the continuation bar in the sleeve and rotate the bar into the coupler.



### STEP 3

Continue to screw the bar into the coupler until tight.



### STEP 4

To ensure correct installation, tighten the joint to the specified torque using the calibrated torque wrench on the continuation bar.



## TORQUE SETTINGS: D-310 TAPER-LOCK STANDARD COUPLER

Taper-Lock Coupler Torque Chart

Rebar Size			Applied Torque		Wrench Setting			
Imperial	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	—	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	—	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-

## D-320 TAPER-LOCK TRANSITIONAL COUPLER

### PRODUCT DESCRIPTION:

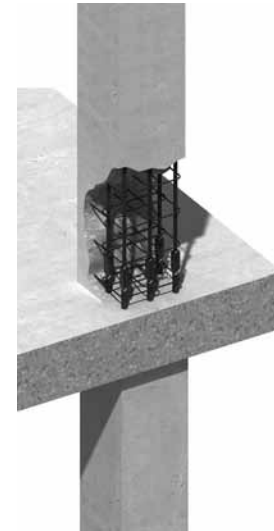
The D-320 Taper-Lock is used to join two reinforcing bars of different sizes. It is commonly used for economic designs and columns where the diameter of the rebar reduces as the columns extend up the structure.

### PRODUCT FEATURES AND BENEFITS:

- Eliminates rebar congestion
- Reduces engineering design time
- Allows for the connection of two different size bars
- Provides Type 2 splicing capacities ( $160\% F_y$ ) and simplifies load paths
- Meets approval from ICC (ESR 2481), ACI, CalTrans, IBC 2006 and Ministries of Transportation for Ontario and Quebec
- Approved for use in fatigue applications

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates all rebar configurations
- Available in Black or Epoxy
- Type 2 Splice ( $160\%$  of  $F_y$ )
- Threads in internal sleeve correspond to the appropriate bar size
- Each end must be tightened and calibrated with a torque wrench



### PRODUCT CODES

Bar Size			Made in the USA (Epoxy)	Made in the USA (Black)
US	Metric (mm)	CN (m)	ASTM A311 Grade 1144	ASTM A311 Grade 1144
#4-#5	[13-16]	[10-15]	127249	127218
#5-#6	[16-19]	[15-20]	127250	127219
#6-#7	[19-22]	-	127251	127220
#7-#8	[22-25]	-	127252	127221
#8-#9	[25-29]	[25-30]	127253	127222
#9-#10	[29-32]	-	127254	127223
#10-#11	[32-36]	-	127255	127224
#11-#14	[36-43]	[35-45]	127256	127225
#14-#18	[43-57]	[45-55]	127257	127226

Other sizes available upon request

### HOW TO ORDER :

#### SPECIFY:

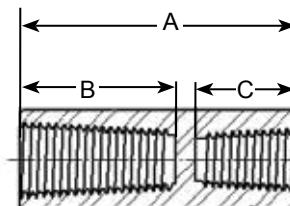
1. Quantity
2. Name
3. Rebar size
4. Finish

#### EXAMPLE:

1. 500 pieces
2. D-320 Taper-Lock® Transitional Coupler
3. #6 - #7
4. Black

### NOMINAL ENGAGEMENT

Bar Size			"A"		"B" (Nominal)		"C" (Nominal)	
US	Metric [mm]	CN [M]	US	[mm]	US	[mm]	US	[mm]
#4-#5	[13-16]	[10-15]	2.7953	[71]	1.5748	[40]	1.0236	[26]
#5-#6	[16-19]	[15-20]	3.0315	[77]	1.6535	[42]	1.378	[35]
#6-#7	[19-22]	—	3.2283	[82]	1.7931	[45.5]	1.437	[36.5]
#7-#8	[22-25]	—	3.6024	[91.5]	2.0079	[51]	1.5945	[40.5]
#8-#9	[25-29]	[25-30]	4.0157	[102]	2.2047	[56]	1.811	[46]
#9-#10	[29-32]	—	4.4488	[113]	2.4409	[62]	2.0079	[51]
#10-#11	[32-36]	—	4.9213	[125]	2.6772	[68]	2.2441	[57]
#11-#14	[36-43]	[35-45]	5.5906	[142]	3.1102	[79]	2.4803	[63]
#14-#18	[43-57]	[45-55]	6.9291	[176]	4.0157	[102]	2.9134	[74]





## INSTALLATION:

### D-320 TAPER-LOCK TRANSITIONAL COUPLER

When installing the D-320 Transitional coupler, the larger of the two bars must be connected first the smaller bar is to be connected after the coupler is tightened to the appropriate torque on the larger rebar. This process ensures that the smaller bar does not receive the higher torque used to connect the larger bar. As an alternative, it is permitted to connect the smaller bar to the coupler first. If the smaller bar is connected first, a second wrench can be used to keep the coupler from rotating while the second connection to the larger bar is made.

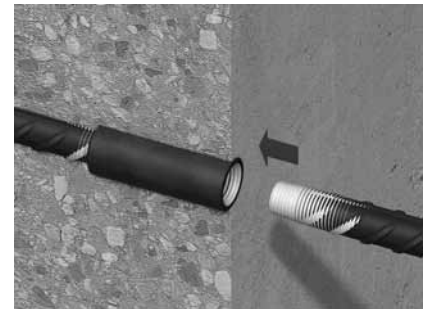
#### STEP 1

The coupler is normally supplied fixed to the reinforcing bar, ready to be installed and cast in concrete.



#### STEP 2

After casting the concrete and when ready to extend, remove the thread protector from the coupler. Position the continuation bar in the sleeve and rotate the bar into the coupler.



#### STEP 3

Continue to screw the bar into the coupler until tight.



#### STEP 4

To ensure correct installation, tighten the joint to the specified torque using the calibrated torque wrench on the continuation bar.



#### TORQUE SETTINGS:

### D-320 TAPER-LOCK® TRANSITIONAL COUPLER

Taper-Lock Coupler Torque Chart

Rebar Size			Applied Torque		Wrench Setting			
Imperial	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	—	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	—	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-

## D-330 TAPER-LOCK POSITIONAL COUPLER

### PRODUCT DESCRIPTION:

The D-330 Taper-Lock is used to join two bars of the same size where neither bar can be rotated. Typical applications are hook bar connections and column to slab connections.

### PRODUCT FEATURES AND BENEFITS:

- Eliminates rebar congestion
- Reduces engineering design time
- Rebar never has to be rotated
- Provides Type 2 splicing capacities (160%  $F_y$ ) and simplifies load paths
- Meets approval from ICC (ESR 2481), ACI, CalTrans, IBC 2006 and Ministries of Transportation for Ontario and Quebec
- Approved for use in fatigue applications
- Adjustability of coupler allows it to be a closer between two fixed bars

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Black or Epoxy
- Type 2 Splice (160% of  $F_y$ )
- Uses a three part system for connecting rebar
- Each end must be tightened and calibrated with a torque wrench

### PRODUCT CODES

Bar Size			Made in USA (Black)	Made in the USA (Epoxy)	(Black)
US	Metric (mm)	CN (m)	ASTM A311 Grade 1144	ASTM A311 Grade 1144	ASTM A576 Grade 1045
#4	[13]	[10]	127065	127239	128268
#5	[16]	[15]	127066	127240	128269
#6	[19]	[20]	127067	127241	128270
#7	[22]	-	127068	127242	128271
#8	[25]	[25]	127069	127243	128272
#9	[29]	[30]	127070	127244	128273
#10	[32]	-	127071	127245	128274
#11	[36]	[35]	127072	127246	128275
#14	[43]	[45]	127073	127247	128276
#18	[57]	[55]	127074	127248	128277

### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish
5. Made in USA requirement

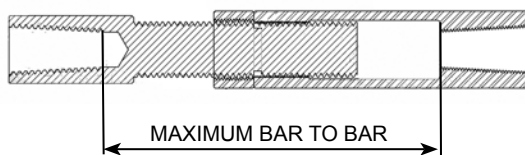
#### EXAMPLE:

1. 500 pieces
2. D-330 Taper-Lock® Positional Coupler
3. #6
4. Black
5. Made in USA not required

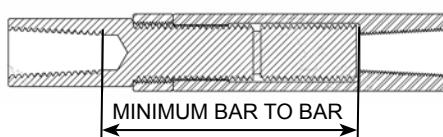
### NOMINAL ENGAGEMENT

Bar Size			MAXIMUM BAR TO BAR DISTANCE		MINIMUM BAR TO BAR DISTANCE	
US	Metric [MM]	CN [M]	US	[mm]	US	[mm]
#4	[13]	[10]	4.4	[111.8]	4	[101.5]
#5	[16]	[15]	4.8	[121.0]	4.3	[109.2]
#6	[19]	[20]	4.7	[119.5]	4.4	[111.8]
#7	[22]	-	6.5	[166.2]	5.8	[147.3]
#8	[25]	[25]	6.7	[170.5]	5.8	[147.3]
#9	[29]	[30]	6.8	[172.5]	5.9	[149.9]
#10	[32]	-	7.3	[186.5]	6.3	[158.9]
#11	[36]	[35]	8.3	[210.0]	6.8	[172.6]
#14	[43]	[45]	9.6	[244.0]	7.7	[195.6]
#18	[57]	[55]	12.3	[312.1]	9.5	[241.2]

#### MAXIMUM EXTENDED POSITION



#### MINIMAL COLLAPSED POSITION



## INSTALLATION: D-330 TAPER-LOCK POSITIONAL COUPLER

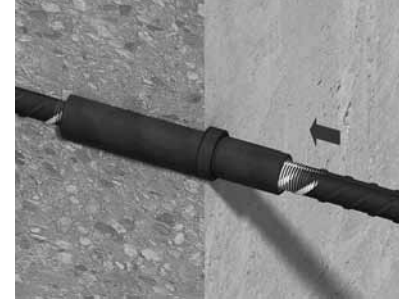
### STEP 1

The female section of the positional coupler is normally cast flush in concrete. The installer must take care to protect the internal threads and prevent the ingress of concrete. Once cast and ready to extend, the male end complete with locknut can be screwed into place.



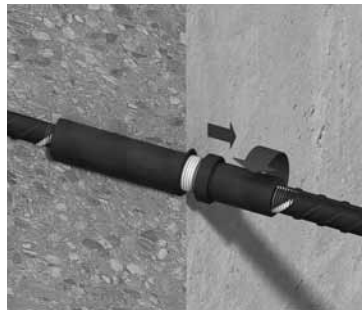
### STEP 2

Position the continuation bar as near as possible to the coupler fitted to the cast-in-bar.



### STEP 3

Run the male component and locknut onto the continuation bar until fully engaged.



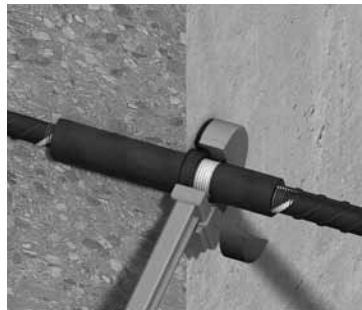
### STEP 4

Using the torque wrench, tighten the male component on the continuation bar to the specified torque while holding the continuation bar with a second wrench.



### STEP 5

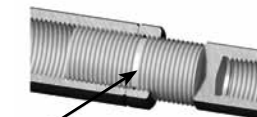
Run the locknut along the threaded barrel of the male component to adjoin the female section. Using the torque wrench, tighten the locknut to the specified torque.



### CORRECT INSTALLATION

The groove in the parallel threaded section of the male component must be completely covered by the locknut. If any part of the groove is visible beyond the locknut, the degree of adjustability has been exceeded and the installation is incorrect.

### CORRECT INSTALLATION



Groove is completely hidden within locknut

### INCORRECT INSTALLATION



Groove is protruding from locknut

### TORQUE SETTINGS:

#### DA-330 TAPER-LOCK POSITIONAL COUPLER

Taper-Lock Coupler Torque Chart

Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	—	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	—	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-

Taper-Lock Locking Nut Torque Chart

Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	17 lb-ft	23 Nm	-	-	9 lb-ft	12 Nm
#5	16mm	[15]	24 lb-ft	33 Nm	-	-	13 lb-ft	18 Nm
#6	19mm	[20]	33 lb-ft	45 Nm	-	-	18 lb-ft	24 Nm
#7	22mm	—	45 lb-ft	61 Nm	-	-	24 lb-ft	33 Nm
#8	25mm	[25]	60 lb-ft	81 Nm	-	-	32 lb-ft	43 Nm
#9	29mm	[30]	62 lb-ft	84 Nm	-	-	33 lb-ft	45 Nm
#10	32mm	—	69 lb-ft	94 Nm	-	-	37 lb-ft	50 Nm
#11	36mm	[35]	75 lb-ft	102 Nm	-	-	40 lb-ft	54 Nm
#14	43mm	[45]	91 lb-ft	124 Nm	57 lb-ft	77 Nm	-	-
#18	57mm	[55]	99 lb-ft	135 Nm	70 lb-ft	95 Nm	-	-

## D-340 TAPER-LOCK FLANGE COUPLER

### PRODUCT DESCRIPTION:

The D-340 Taper-Lock simplifies the forming process by eliminating the need to cut or drill the formwork. It is used for segmental pours, precast applications, formed applications, and future work applications.

### PRODUCT FEATURES AND BENEFITS:

- Reduces engineering design time
- Provides a safer working environment by eliminating protruding rebar ends through the formwork
- Eliminates the need to cut or drill formwork
- Eliminates rebar congestion
- Provides Type 2 splicing capacities (160%  $F_y$ ) and simplifies load paths
- Meets approval from ICC (ESR 2481), ACI, CalTrans, IBC 2006, and Ministries of Transportation for Ontario and Quebec, Canada
- Approved for use in fatigue applications

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Black or Epoxy
- Type 2 Splice (160% of  $F_y$ )
- Fastened to formwork by nails
- Each end must be tightened with calibrated torque wrench



### PRODUCT CODES

US	Bar Size		Made in USA (Black) ASTM A311 Grade 1144	Made in the USA (Epoxy) ASTM A311 Grade 1144	Made in the USA (Hot dipped Galva- nized) ASTM A311 Grade 1144	(Black) ASTM A576 Grade 1045	(Epoxy) ASTM A576 Grade 1045
	Metric (mm)	CN (m)					
#4	[13]	[10]	127790	127847	128078	127881	128342
#5	[16]	[15]	127791	127848	128079	127882	128343
#6	[19]	[20]	127792	127849	128080	127885	128344
#7	[22]	-	127793	127850	128081	127888	128345
#8	[25]	[25]	127794	127851	128082	127890	128346
#9	[29]	[30]	127795	127852	128083	127892	128347
#10	[32]	-	127796	127853	128084	127894	128348
#11	[36]	[35]	127797	127854	182085	127896	128349
#14	[43]	[45]	127798	127855	128313	128373	128350
#18	[57]	[55]	127799	127856	128314	128374	128351

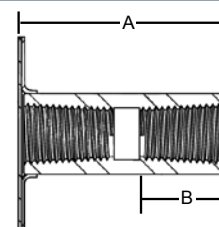
### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish
5. Made in USA requirement

#### EXAMPLE:

1. 500 pieces
2. D-340 Taper-Lock® Flange Coupler
3. #6
4. Black
5. Made in USA not required



### NOMINAL ENGAGEMENT

US	Bar Size		"A"		"B"	
	Metric [MM]	CN [M]	US	[mm]	US	[mm]
#4	[13]	[10]	2.362	[60]	1.024	[26]
#5	[16]	[15]	2.756	[70]	1.221	[31]
#6	[19]	[20]	2.874	[73]	1.281	[32.5]
#7	[22]	-	3.189	[81]	1.399	[35.5]
#8	[25]	[25]	3.622	[92]	1.615	[41]
#9	[29]	[30]	4.016	[102]	1.812	[46]
#10	[32]	-	4.488	[114]	2.049	[52]
#11	[36]	[35]	4.921	[125]	2.246	[57.5]
#14	[43]	[45]	5.827	[148]	2.719	[69]
#18	[57]	[55]	7.638	[194]	3.625	[92]

### TORQUE SETTINGS

Taper-Lock Coupler Torque Chart								
Rebar Size			Applied Torque		Wrench Setting			
US	Metric [MM]	CN [M]	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	-	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	-	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-



## D-350 TAPER-LOCK END ANCHOR DISC

### PRODUCT DESCRIPTION:

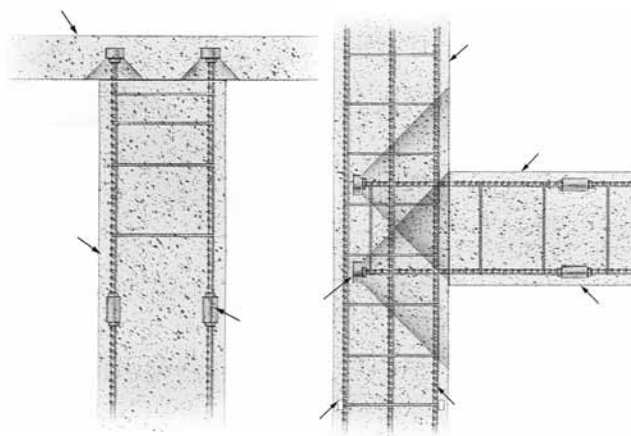
The D-350 Taper-Lock End Anchor Discs simplify rebar splicing in areas where rebar congestion prevents the use of long lap splices or large diameter hooked rebar. The D-350 Taper-Lock End Anchor Discs can be used for end anchoring, stirrup replacements, continuous splicing, and heavy anchorage of light standards and other signage.

### PRODUCT FEATURES AND BENEFITS:

- Eliminates rebar congestion and aids in concrete placement
- Eliminates the need for hooked rebar
- Reduces engineering design time
- Provides Type 2 splicing capacities ( $160\% F_y$ ) and simplifies load paths
- Improves safety related issues on the job site by reducing protruding dowels
- Conforms to ASTM A-970, ACI, Cal Trans, IBC 2006 and Ministries of Transportation for Ontario and Quebec
- Develops full strength with hand-tighten installation

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Plain or Epoxy
- Type 2 Splice ( $160\% F_y$ )
- Minimum Net Headed Bearing Area of 9Ab
- ICC Approval - pending



### PRODUCT CODES - D-350 TAPER-LOCK END ANCHOR

Bar Size			Made in the USA (Black) ASTM A311 Grade 1144	Made in the USA (Epoxy) ASTM A311 Grade 1144	(Black) ASTM A576 Grade 1045	(Epoxy) ASTM A576 Grade 1045
US	Metric (mm)	CN (m)				
#4	[13]	[10]	127940	128017	128221	128332
#5	[16]	[15]	127941	128018	128222	128333
#6	[19]	[20]	127942	128019	128223	128334
#7	[22]	-	127943	128020	128224	128335
#8	[25]	[25]	127944	128021	128225	128336
#9	[29]	[30]	127945	128022	128226	128337
#10	[32]	-	127946	128023	128227	128338
#11	[36]	[35]	127947	128024	128228	128339
#14	[43]	[45]	127948	128025	128229	128340
#18	[57]	[55]	127949	128026	128230	128341

### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish
5. Made in USA requirement

#### EXAMPLE:

1. 500 pieces
2. D-350 Taper-Lock® End Anchor Disc
3. #6
4. Black
5. Made in USA not required

## D-351 TAPER-LOCK END ANCHOR DISC

### PRODUCT DESCRIPTION:

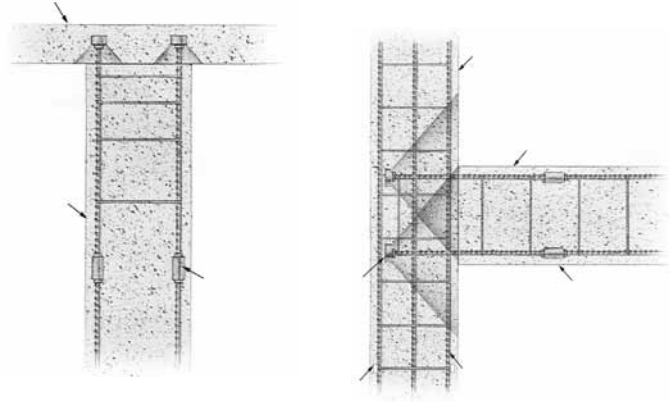
The D-351 Taper-Lock End Anchor Discs simplify rebar splicing in areas where rebar congestion prevents the use of long lap splices or large diameter hooked rebar. The D-351 Taper-Lock End Anchor Discs can be used for end anchoring, stirrup replacements, continuous splicing, and heavy anchorage of light standards and other signage.

### PRODUCT FEATURES AND BENEFITS:

- Eliminates rebar congestion and aids in concrete placement
- Eliminates the need for hooked rebar
- Reduces engineering design time
- Provides Type 2 splicing capacities ( $160\% F_y$ ) and simplifies load paths
- Improves safety related issues on the job site by reducing protruding dowels
- Conforms to ASTM A-970, ACI, Cal Trans, IBC 2006 and Ministries of Transportation for Ontario and Quebec
- Develops full strength with hand-tighten installation

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Plain or Epoxy
- Type 2 Splice ( $160\% F_y$ )
- Minimum Net Headed Bearing Area of 4Ab
- ICC Approval - pending



### PRODUCT CODES - D-351 TAPER-LOCK END ANCHOR

Bar Size			Made in USA (Black) ASTM A311 Grade 1144	Made in the USA (Epoxy) ASTM A311 Grade 1144	(Black) ASTM A576 Grade 1045	(Epoxy) ASTM A576 Grade 1045
US	Metric (mm)	CN (m)				
#4	[13]	[10]	128430	128420	128375	128440
#5	[16]	[15]	128431	128421	128376	128441
#6	[19]	[20]	128432	128422	128377	128442
#7	[22]	-	128433	128423	128378	128443
#8	[25]	[25]	128434	128424	128379	128444
#9	[29]	[30]	128435	128425	128380	128445
#10	[32]	-	128436	128426	128381	128446
#11	[36]	[35]	128437	128427	128382	128447
#14	[43]	[45]	128438	128428	128383	128448
#18	[57]	[55]	128439	128429	128384	128449

### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish
5. Made in USA requirement

#### EXAMPLE:

1. 500 pieces
2. D-350 Taper-Lock® End Anchor Disc
3. #6
4. Black
5. Made in USA not required

## D-352 TAPER-LOCK COLUMN CONNECTOR

### PRODUCT DESCRIPTION:

The D-352 Taper-Lock Column Connector combines the features of the D-340 Flange Coupler and the D-350 End Anchor Disc. This unique product simplifies the forming process by eliminating the need to cut or drill formwork. Additionally, rebar splicing is simplified in areas where rebar congestion prevents the use of long lap splices or large diameter hooked rebar. This product can be used for segmental pours, precast applications, and future work applications that require end anchorage.

### PRODUCT FEATURES AND BENEFITS:

- Eliminates rebar congestion and aids in concrete placement
- Eliminates the need for hooked rebar
- Reduces engineering design time
- Provides Type 2 splicing capacities ( $160\% F_y$ ) and simplifies load paths
- Improves safety related issues on the job site by reducing protruding dowels
- Conforms to ASTM A-970, ACI, Cal Trans, IBC 2006 and Ministries of Transportation for Ontario and Quebec
- Eliminates the need to cut or drill formwork

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Available in Plain or Epoxy
- Type 2 Splice ( $160\% F_y$ )
- Minimum Net Headed Bearing Area of  $9A_b$
- Fastened to formwork by nails

### PRODUCT CODES

US	Bar Size		Made in the USA (Black) ASTM A311 Grade 1144	Made in the USA (Epoxy) ASTM A311 Grade 1144
	Metric (mm)	CN (m)		
#4	[13]	[10]	128395	128410
#5	[16]	[15]	128396	128411
#6	[19]	[20]	128397	128412
#7	[22]	-	128398	128413
#8	[25]	[25]	128399	128414
#9	[29]	[30]	128400	128415
#10	[32]	-	128401	128416
#11	[36]	[35]	128402	128417
#14	[43]	[45]	128403	128418
#18	[57]	[55]	128404	128419

### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size
4. Finish

#### EXAMPLE:

1. 500 pieces
2. D-352 Taper-Lock® Column Connector
3. #6
4. Black

### TAPER-LOCK TORQUE SETTING

Taper-Lock Coupler Torque Chart								
Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	-	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	-	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-

## D-360 TAPER-LOCK WELDABLE COUPLER

### PRODUCT DESCRIPTION:

The Taper-Lock D-360 weldable couplers provide a convenient means of connecting reinforcing bars to structural steel plates or sections. Shorter than the standard coupler, it has a tapered thread at one end. The other end is welded directly to the steel.

The couplers are produced in either ASTM A576 grade 1045 or ASTM A108 grade C1018.

The Taper-Lock weldable coupler is suitable for welding to structural steels. The load conditions at the connection must be determined by the engineer along with the type and size of weld required. Another important consideration is the type of electrode to be used, which must be matched to the properties of the plate and tube, and to the site conditions under which the welding will be undertaken. Welders should be qualified for the type of weld required.



### PRODUCT FEATURES AND BENEFITS:

- The compact design of the coupler ensures suitability for use in confined situations where space is restricted or where the loss of cover must be minimized
- Reduces engineering design time
- Eliminates rebar congestion
- Provides Type 2 splicing capacities (160%  $F_y$ ) and simplifies load paths
- Meets approval from ICC (ESR 2481), ACI, CalTrans, IBC 2006, and Ministries of Transportation for Ontario and Quebec
- Approved for use in fatigue applications

### PRODUCT SPECIFICATIONS:

- Extension of Taper-Lock product line
- Accommodates rebar sizes #4 through #18
- Type 2 Splice (160% of  $F_y$ )
- Must be tightened with calibrated torque wrench

### HOW TO ORDER :

#### SPECIFY:

1. Quantity
2. Name
3. Rebar size

#### EXAMPLE:

1. 500 pieces
2. D-360 Taper-Lock® Weldable Coupler
3. #6

### PRODUCT CODES

Bar Size			Made in USA ASTM A576, Grade 1045 or ASTM A108, Grade C1018
US	Metric (mm)	CN (m)	
#4	[13]	[10]	128385
#5	[16]	[15]	128386
#6	[19]	[20]	128387
#7	[22]	-	128388
#8	[25]	[25]	128389
#9	[29]	[30]	128390
#10	[32]	-	128391
#11	[36]	[35]	128392
#14	[43]	[45]	128393
#18	[57]	[55]	128394

### TORQUE SETTINGS

Taper-Lock Coupler Torque Chart								
Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	—	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	—	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-



### Cyclic Test Results - Compression

Bar Size	Bar Area (in <sup>2</sup> )	Compressive Strength		
		(kips)	(ksi)	(%fy=60)
4	0.20	18	90	150%
5	0.31	27.9	90	150%
6	0.44	39.6	90	150%
7	0.60	54	90	150%
8	0.79	71.1	90	150%
9	1.00	90	90	150%
10	1.27	106.7	84	140%
11	1.56	140.4	90	150%
14	2.25	175	77.8	130%
18	4.00	333.6	83.4	139%

### Cyclic Test Results - Standard Specimens

Bar Size	Bar Area (in <sup>2</sup> )	Cyclic Load Levels (Stages 1, 2, 3)				Tensile Strength (Stage 4)			
		Pmin (kips)	Pmax1 (kips)	Pmax2 (kips)	Pmax3 (kips)	(kips)	(ksi)	(%fy=60)	(%fua)
4	0.20	-6	11.4	12.0	13.1	19.7	98.3	163.6	99.2
5	0.31	-9.3	17.7	18.3	20.66	31.1	100.32	167.2	97.6
6	0.44	-13.2	25.1	27.22	29.24	42.44	96.44	160.8	97.6
7	0.60	-18	34.2	37.64	39.38	58.56	97.6	162.8	77.996
8	0.79	-23.7	45	52.76	54.56	78.58	99.46	165.6	96.6
9	1.00	-30	57	65.72	71.62	97.96	97.96	163.4	96
10	1.27	-38.1	72.4	95.66	98.98	122.26	96.26	160.6	98.2
11	1.56	-46.8	88.9	97.46	111.18	153.1	98.16	163.8	96.4
14	2.25	-67.5	128.3	156.86	173.9	226.56	100.68	167.8	97
18	4.00	-120	228	339.6	375.2	421.14	105.3	175.6	88.8

### Cyclic Test Results - Position/Transition Specimens

Bar Size	Coupler Type	Bar Area (in <sup>2</sup> )	Cyclic Load Levels (Stages 1, 2, 3)				Tensile Strength (Stage 4)			
			Pmin (kips)	Pmax1 (kips)	Pmax2 (kips)	Pmax3 (kips)	(kips)	(ksi)	(%fy=60)	(%fua)
4	4/5 Transition	0.20	-6	11.4	12.2	12.9	19.5	97.3	162.2	98.0
5	5/6 Transition	0.31	-9.3	17.7	18.4	20.5	30.8	99.2	165.6	96.8
6	6 Position	0.44	-13.2	25.1	27.2	28.0	42.7	97.1	162.0	98.4
7	7/8 Transition	0.60	-18	34.2	37.4	39.5	58.8	98.0	163.2	98.0
8	8 Position	0.79	-23.7	45.0	53.1	55.1	78.5	99.4	165.4	96.6
9	9/10 Transition	1.00	-30	57.0	66.4	72.6	98.0	98.0	163.2	96.0
10	10 Position	1.27	-38.1	72.4	95.3	98.1	121.3	95.5	159.2	97.2
11	11/14 Transition	1.56	-46.8	88.9	97.9	111.9	156.1	100.0	167.0	98.6
14	14 Position	2.25	-67.5	128.3	150.4	181.7	223.5	99.3	165.6	87.4

## TORQUE WRENCHES

It is important that the taper thread couplers fitted to a threaded rebar are applied with a known torque. This ensures that the finished coupling will perform properly and conform to the published specifications. Obviously, as with any threaded joint, any variation in the applied torque will affect the joint performance. By gauging the thread on the rebar the User can be certain that the thread diameters, thread length and thread pitch will be correct and can be used successfully with a Taper-Lock Coupler.



In order to ensure that the correct torque is applied to the coupling DSC recommends the use of the Torque wrenches, which are especially produced to suit the specific requirements of the coupler range.

It is important for the User to understand the correct method of using a torque wrench and how to apply the torque using the wrench.

### GENERAL INSTRUCTIONS:

- The wrench is a precision instrument that has been produced to suit the rugged industrial conditions it is likely to be used in. However, it is essential that the User treats the wrench with care, uses it properly and stores it correctly when it is not in use.
- The torque wrench is to be used solely for the purpose of applying known torque's to the rebar/coupler joints.
- It is not to be used for any other makes of couplers.
- Do not use the torque wrench for any purpose other than that for which it is supplied.
- When using this wrench torque must be applied in a smooth and continuous fashion until the correct set torque is reached. Do not snatch or jerk the wrench as this will result in false readings.
- Do not use the wrench as a general pipe wrench, it is to be used for the application of specific torques only.
- Do not try and exceed its minimum or maximum values. Always stay within the specific range of the wrench.
- Do not the wrench as a hammer or a lever. It is a precision instrument.
- When not being used the wrench should be laid safely to one side and protected from dirt, dust and rain.
- The torque wrench assembly cannot be cleaned with a gasoline or kerosene.
- If there is any doubt regarding the performance of the torque wrench it must be replaced. Do not use a wrench known to be faulty.
- Use the correct size torque wrench for the appropriate diameter, component and torque setting.

### CALIBRATION OF THE TORQUE WRENCH:

Each torque wrench is supplied with a calibration certificate. This certificate must be kept in a safe place allowing it to be referred to when required. This certificate shows the serial number of the wrench, the date it was calibrated and the values that the wrench should be set to for a specific requirement. This is detailed in the following part of this section.

An example certificate is as attached. The certificate shows the details of the wrench and the serial number of the wrench assembly. The bottom part of the certificate is a table, which shows the Required Torque, the Set Torque and the Calibration Diameter.

It is important to understand the way in which this table is generated and used. This is dealt with in the next part of this section of the manual.

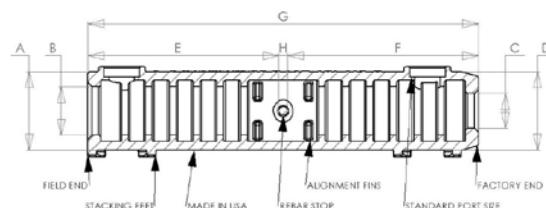
Taper-Lock Locking Nut Torque Chart								
Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	17 lb-ft	23 Nm	-	-	9 lb-ft	12 Nm
#5	16mm	[15]	24 lb-ft	33 Nm	-	-	13 lb-ft	18 Nm
#6	19mm	[20]	33 lb-ft	45 Nm	-	-	18 lb-ft	24 Nm
#7	22mm	—	45 lb-ft	61 Nm	-	-	24 lb-ft	33 Nm
#8	25mm	[25]	60 lb-ft	81 Nm	-	-	32 lb-ft	43 Nm
#9	29mm	[30]	62 lb-ft	84 Nm	-	-	33 lb-ft	45 Nm
#10	32mm	—	69 lb-ft	94 Nm	-	-	37 lb-ft	50 Nm
#11	36mm	[35]	75 lb-ft	102 Nm	-	-	40 lb-ft	54 Nm
#14	43mm	[45]	91 lb-ft	124 Nm	57 lb-ft	77 Nm	-	-
#18	57mm	[55]	99 lb-ft	135 Nm	70 lb-ft	95 Nm	-	-

Taper-Lock Coupler Torque Chart								
Rebar Size			Applied Torque		Wrench Setting			
US	Metric (mm)	CN (M)	Imperial	Metric	Large		Small	
					Imperial	Metric	Imperial	Metric
#4	13mm	[10]	55 lb-ft	75 Nm	-	-	39 lb-ft	53 Nm
#5	16mm	[15]	81 lb-ft	110 Nm	62 lb-ft	84 Nm	57 lb-ft	77 Nm
#6	19mm	[20]	111 lb-ft	150 Nm	85 lb-ft	115 Nm	78 lb-ft	106 Nm
#7	22mm	—	151 lb-ft	205 Nm	116 lb-ft	157 Nm	105 lb-ft	143 Nm
#8	25mm	[25]	199 lb-ft	270 Nm	153 lb-ft	207 Nm	139 lb-ft	188 Nm
#9	29mm	[30]	207 lb-ft	280 Nm	159 lb-ft	215 Nm	146 lb-ft	198 Nm
#10	32mm	—	210 lb-ft	285 Nm	162 lb-ft	219 Nm	147 lb-ft	199 Nm
#11	36mm	[35]	225 lb-ft	305 Nm	173 lb-ft	234 Nm	-	-
#14	43mm	[45]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-
#18	57mm	[55]	247 lb-ft	335 Nm	190 lb-ft	257 Nm	-	-

## D-410 Sleeve-Lock™ Grout Sleeve

The Dayton Superior Sleeve-Lock Grout Sleeve is a one-piece mechanical coupler designed to butt-splice reinforcing steel in concrete structures. The Sleeve-Lock is available in seven (7) sizes to accommodate deformed bar sizes #4 through #18. Bars of like size or of different sizes can be effectively spliced by the System. Typical Sleeve-Lock applications include precast and cast-in-place concrete structures.

The Sleeve-Lock is a ductile casting with a minimum yield strength of 55,000 psi and a minimum tensile strength of 80,000 psi. It exceeds all known building codes and agency standards. The System achieves 160% fy strength criteria with the Dayton Superior S-L Grout™ high strength, non-shrink grout.



The Sleeve has several unique features :

- Rebar Stop – An integrated post that acts as a precise stop when inserting rebar
- Alignment Fins – Positioning fins that keep inserted rebar centered
- Standard Port Sizes – Ports designed to accept standard 0.75" SCH40 PVC; ports use the same size PVC
- Stacking Feet – Feet used to stabilize the product during shipping and on the shelf while assisting in wire-tying and acting as a platform for a rebar chair.
- Made In USA – The sleeve is 100% made in the USA.

SIZE		SLEEVE-LOCK™ DIMENSIONS						REBAR EMBEDMENT LENGTH			
		A	B	C	D	G	H	E, MAX	E, MIN	F, MAX	F, MIN
#4	13MM	2.14	1.26	0.87	2.14	9.50	0.25	4.63	3.30	4.63	3.30
#5	16MM	2.14	1.26	0.87	2.14	9.50	0.25	4.63	4.13	4.63	4.13
#6	19MM	2.61	1.73	1.14	2.61	13.00	0.25	6.38	4.92	6.38	4.92
#7	22MM	2.61	1.73	1.14	2.61	13.00	0.25	6.38	5.71	6.38	5.71
#8	25MM	2.89	2.89	1.42	2.89	16.52	0.38	8.07	6.50	8.07	6.50
#9	29MM	2.89	2.89	1.42	2.89	16.52	0.38	8.07	7.40	8.07	7.40
#10	32MM	3.04	2.16	1.57	3.04	17.99	0.50	8.75	8.19	8.75	8.19
#11	36MM	3.32	2.32	1.73	3.32	19.54	0.50	9.52	8.98	9.52	8.98
#14	43MM	3.73	2.60	2.01	3.73	24.50	0.50	12.00	11.42	12.00	11.42
#18	57MM	4.77	3.27	2.68	4.77	36.00	0.50	17.75	17.00	17.75	17.00

All dimensions are in inches

## D-490 S-L Grout™

S-L Grout™ is specifically designed and manufactured by DSC for the Sleeve-Lock™ System. It is a flow-able grout capable of achieving 11,000ksi when mixed following the recommended mixing instructions of DSC. Available in 50lb bags, yield per bag, noting that grout used in PVC tubing is not accounted for, is as shown in Table 2:

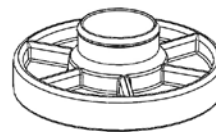
SIZE		SLEEVES PER BAG OF GROUT
#4	13MM	37
#5	16MM	40
#6	19MM	16
#7	22MM	30
#8	25MM	11
#9	29MM	11
#10	32MM	9
#11	36MM	8
#14	43MM	5
#18	57MM	3

Amounts are approximate.

Use only potable water for mixing. A 50 pound (22.7 kg) of grout will require approximately 6.5 pints (3.07 liters) of water to achieve a flowable consistency. The water amount can be adjusted +/- 0.5 pints (0.23 liters) to achieve desired consistency. Determine correct water amount by mixing of a test batch prior to commencing grouting operation.

## D-487 Sleeve-Lock™ Seal Plug

The Sleeve-Lock™ Seal Plug is a rubberized plug used to seal the connection between the Sleeve-Lock™ Grout Sleeve and the reinforcing bar. It is designed to keep concrete from entering the inner cavity of the Sleeve-Lock™ Grout Sleeve on the Factory End and to contain the pumped in grout on the Field End. Per size, the Sleeve-Lock™ Seal Plug can be used on either end meaning that only 1 size Sleeve-Lock™ Seal Plug (QTY 2) per sleeve need be stocked.



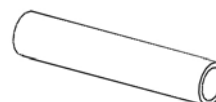
## D-491 Sleeve-Lock™ Form Plug

The Sleeve-Lock™ Form Plug is a device using a rubberized grommet and a clamping device and used to attach the Sleeve-Lock™ Grout Sleeve to a piece of formwork i.e. steel, lumber, composite. It is designed to fasten the sleeve to the formwork while keeping concrete out of the sleeve's inner chamber. It is to be used on the Field End only and is not designed to be used as a structural connection.



## D-492 Sleeve-Lock™ 3/4" SCH40 PVC

The Sleeve-Lock™ 3/4" SCH40 PVC is standard, off the shelf, PVC, used to fill the inner chamber of the Sleeve-Lock™ Grout Sleeve. Either port of the sleeve uses the same size PVC. It is available locally or through DSC.



## D-493 Sleeve-Lock™ Port Plug

The Sleeve-Lock™ Port Plug is a plastic plug used during jobsite shipping to plug the ports in order to keep debris from entering the inner chamber of the sleeve. They can also be used to plug the PVC before or after grouting. One size will fit either end port or PVC.



### How to Specify:

Specific: Mechanical splices shall be the Sleeve-Lock™ Grout Sleeve System manufactured by Dayton Superior Corporation.

Generic: The mechanical connection shall meet building code requirements of developing in tension and compression, as required, by local standards and codes. Grouting must be performed in accordance with the manufacturer's recommended grouting procedures.

## ICC Evaluation Report ESR-2696

Dayton Shear Resistance DSR Products are a cost effective solution to punching shear at column/slab connections. DSR System rails reduce congestion around the column connections, while at the same time dramatically reducing labor costs.

DSR System rails are typically used in post tension and reinforced concrete slabs with direct loading on the columns. Drop panels, beams and column capitals may be eliminated to allow efficient use of flying forms.

Installation of DSR System rails in foundations will increase the punching shear capacity at the base of the columns and in the pile caps. This can provide significant reduction in slab thickness and substantial savings in material, excavation and concrete pumping costs.

DSR System rails can also be used in place of hairpins to eliminate congestion in post-tensioned tendon anchorage zones. One DSR System rail replaces a series of hairpins to provide time, labor and material savings.

## Specifications

Dayton Shear Resistance DSR Products are fabricated with special studs, either studwelded or mechanically crimped to a steel rail.

Material Specifications:

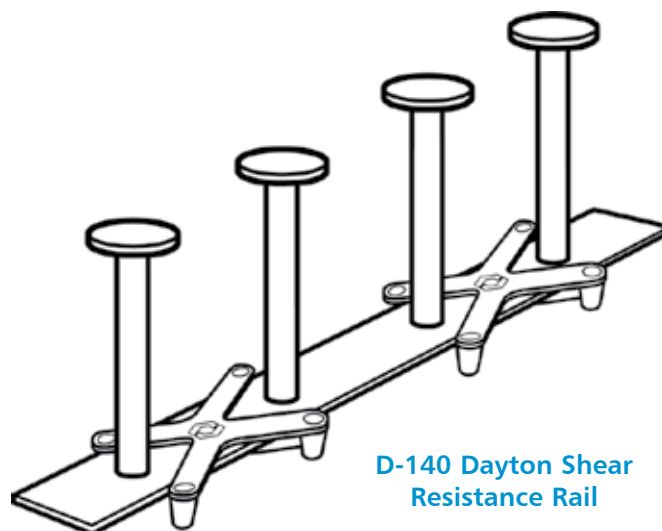
- ◆ Shear studs – Low carbon steel, C1015 in accordance with ASTM A108.
- ◆ Yield Strength – 51,000 psi minimum.
- ◆ Tensile Strength – 65,000 psi minimum.
- ◆ Elongation in 2" – 20%

To develop the full yield strength of the studs in tension, the chart below shows standard dimensions that are applicable.

D in. (mm)	x-sect. area in <sup>2</sup> (mm <sup>2</sup> )	D <sub>h</sub> in. (mm)	t <sub>h</sub> in. (mm)	b <sub>r</sub> in. (mm)	t <sub>r</sub> in. (mm)	min. OAH in. (mm)
3/8 (9.5)	0.110 (71)	1.19 (30.1)	0.21 (5.3)	1 (25.4)	3/16 (4.8)	4 (100)
1/2 (12.7)	0.196 (127)	1.58 (40.2)	0.28 (7.1)	1-1/4 (31.8)	1/4 (6.5)	4 (100)
5/8 (15.9)	0.307 (199)	1.98 (50.2)	0.35 (8.9)	1-3/4 (44.5)	5/16 (7.9)	5 (125)
3/4 (19.1)	0.442 (287)	2.37 (60.2)	0.42 (10.7)	2 (50.8)	3/8 (9.5)	5 (125)

**Note:** Overall height (OAH) of the stud is determined by the slab thickness and required concrete cover.

**Note:** Stud welding is in accordance with American Welding Society (AWS) D1.1 and CSA Standard W59 as certified by the Canadian Welding Bureau.



**D-140 Dayton Shear  
Resistance Rail**

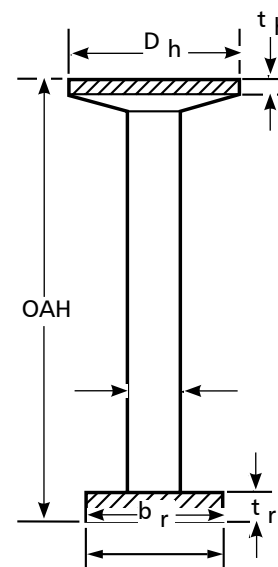
## Typical Specifications

### Specific:

Punching shear reinforcement shall be Dayton Shear Resistance (DSR) as manufactured by Dayton Superior Corporation.

### Generic:

The punching shear reinforcement at the slab-to-column connection as depicted on the drawings shall meet building codes as required by \_\_\_\_\_ (insert name here). The product shall be punching shear reinforcement studs welded to high quality flat steel. The product shall be ICC ES recognized and welding of the product will have occurred in an ICC ES approved and audited facility. The product shall be installed per the manufacturer's approved procedures.

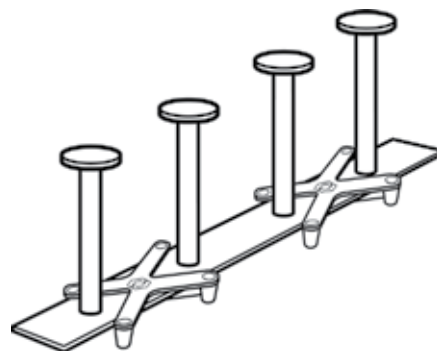


## D-140 Dayton Shear Resistance DSR Products

Dayton Shear Resistance DSR Products feature a large, specially designed headed studs studwelded to a steel base rail. The heads are ten times the cross-sectional area of the stud's stem to provide superior anchorage and prevent slippage. The base plate ensures proper spacing and provides bottom anchorage.

### Seismic Performance

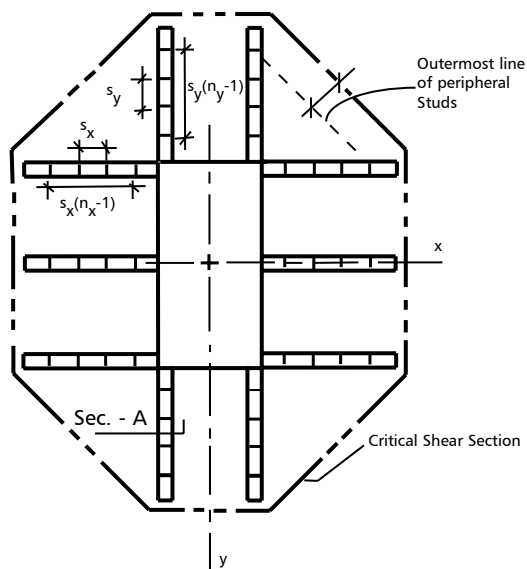
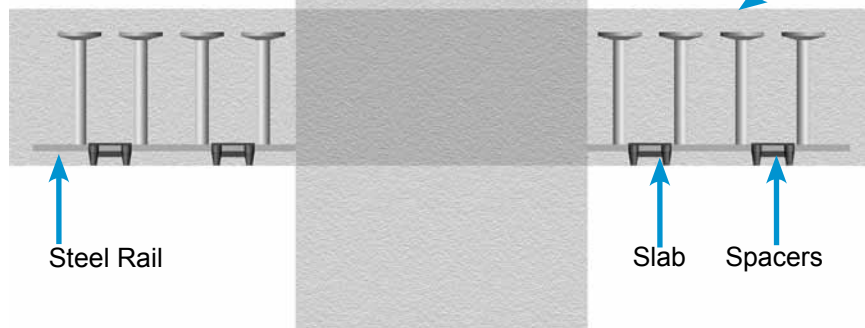
The DSR System has been extensively tested and proven to withstand seismic movement and maintain connection stability long after other connection systems have failed. Lab test results show that DSR System rails provide superior ductility and lateral drift capacity compared to other systems.



**D-140 DSR System  
Rail**

### Typical Detail

Minimum 3/4" Clear Cover





## Installation

Installation of Dayton Shear Resistance DSR System is quick and easy. DSR System rails can normally be installed around a column/slab connection in less than five minutes.

Typical Installation Sequence:

1. Attach the furnished chairs to the base plate of each DSR System rail and place a chair top over the chairs at each end of the DSR System rail.
2. Properly position the DSR System rails on the formwork as per placement drawings.
3. Nail the chairs to the formwork using the blind holes in each chair leg. Repeat Steps 1, 2 and 3 for each DSR System rail.
4. After the DSR System rails are in place, the rebar, post-tensioning tendons, conduit and other embedded items may be set in the form. Since the tops of the DSR System rails are open, it is easy to place rebar or tendons between the studs.

### Notes:

1. Dayton Shear Resistance DSR System must be placed and remain vertical in the slab.
2. Equally space DSR System rails when two or more are required on a single column face.

## Information required for ordering:

- Project name
- Number of complete rails
- Stud diameter
- Number of studs per rails
- Rail OVERALL height
- Distance to the first stud
- Distance between studs
- Slab thickness
- Bottom cover depth

Example:

Project name	4th street parking garage
Number of complete rails	500
Stud diameter	1/2"
Number of studs per rails	8
Rail OVERALL height	6-1/2"
Distance to the first stud	3-0"
Distance between studs	3-1/2"
Slab thickness	8
Bottom cover depth	3/4"

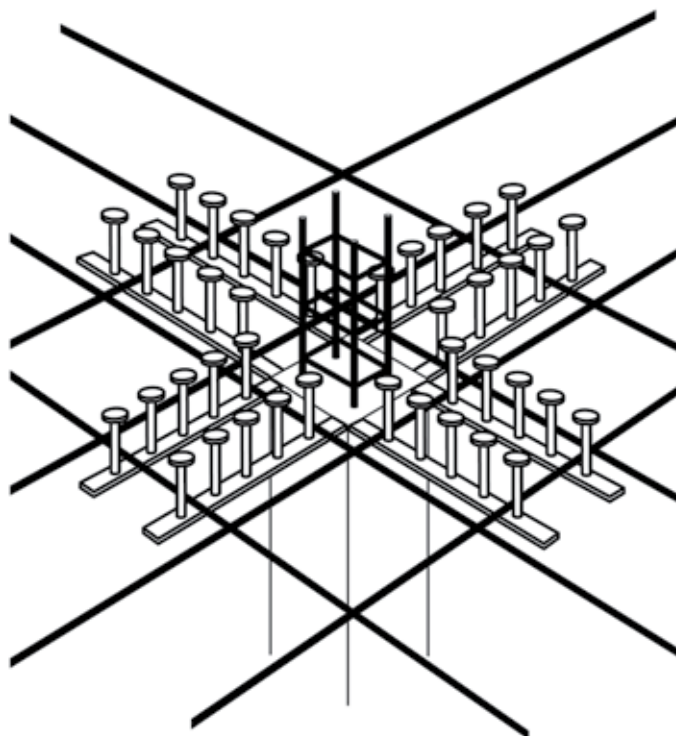
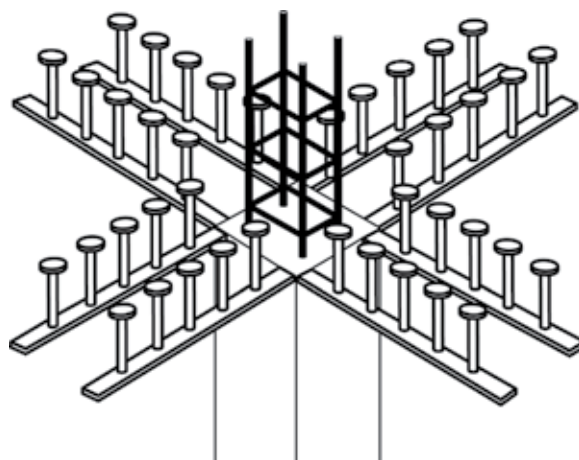
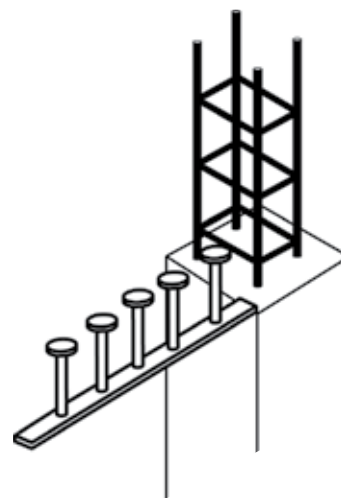
### REQUIRED FOR CONFIRMING PLACING DRAWINGS

Structural Engineer of Record

Name:

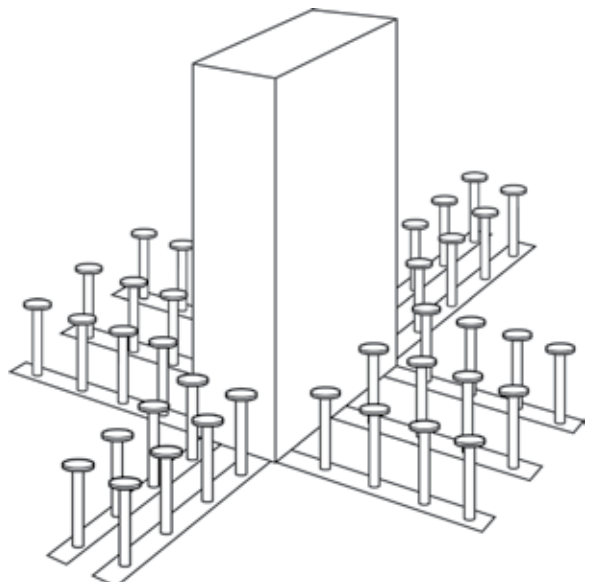
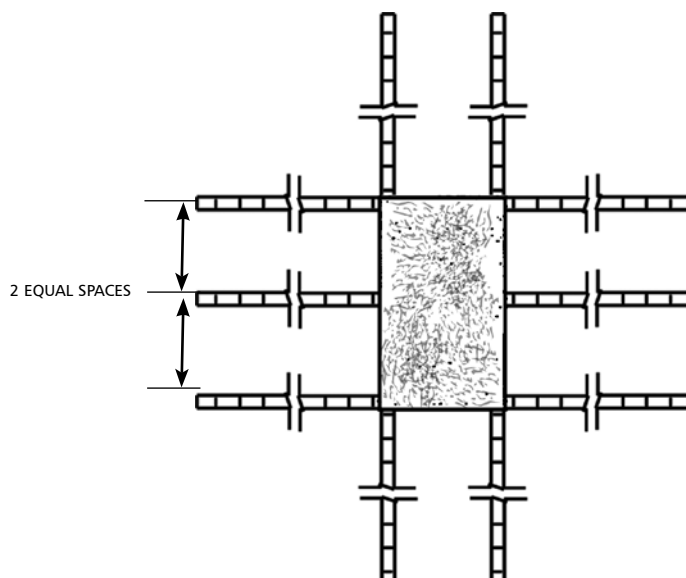
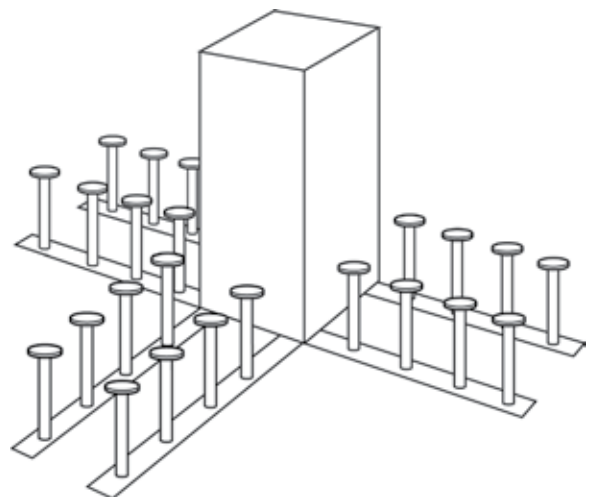
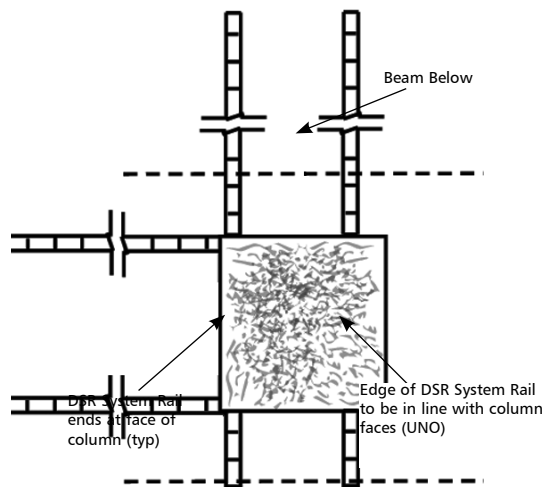
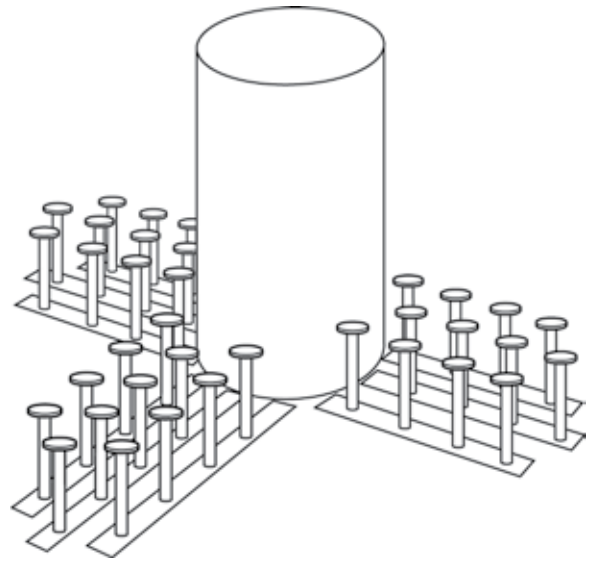
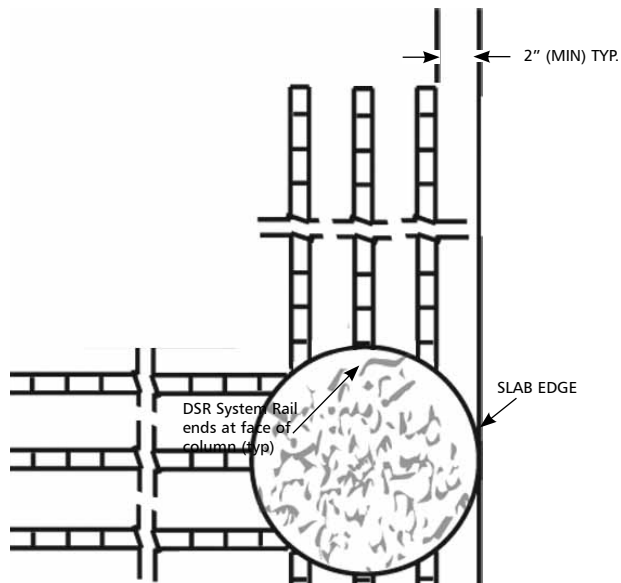
Address:

Phone:





# Dayton Shear Resistance "DSR" Products



## End Anchorage System

The Dayton Superior End Anchorage System is designed to simplify rebar splicing in areas where rebar congestion prevents use of long lap splices or large diameter hooked rebar. The system is designed around a single forge-headed unit in rebar sizes #4 through #11 and is available in various configurations to satisfy numerous applications. For sizes #14 and #18, the system utilizes Dayton Superior's inertia welding capabilities to provide for the heavier applications.

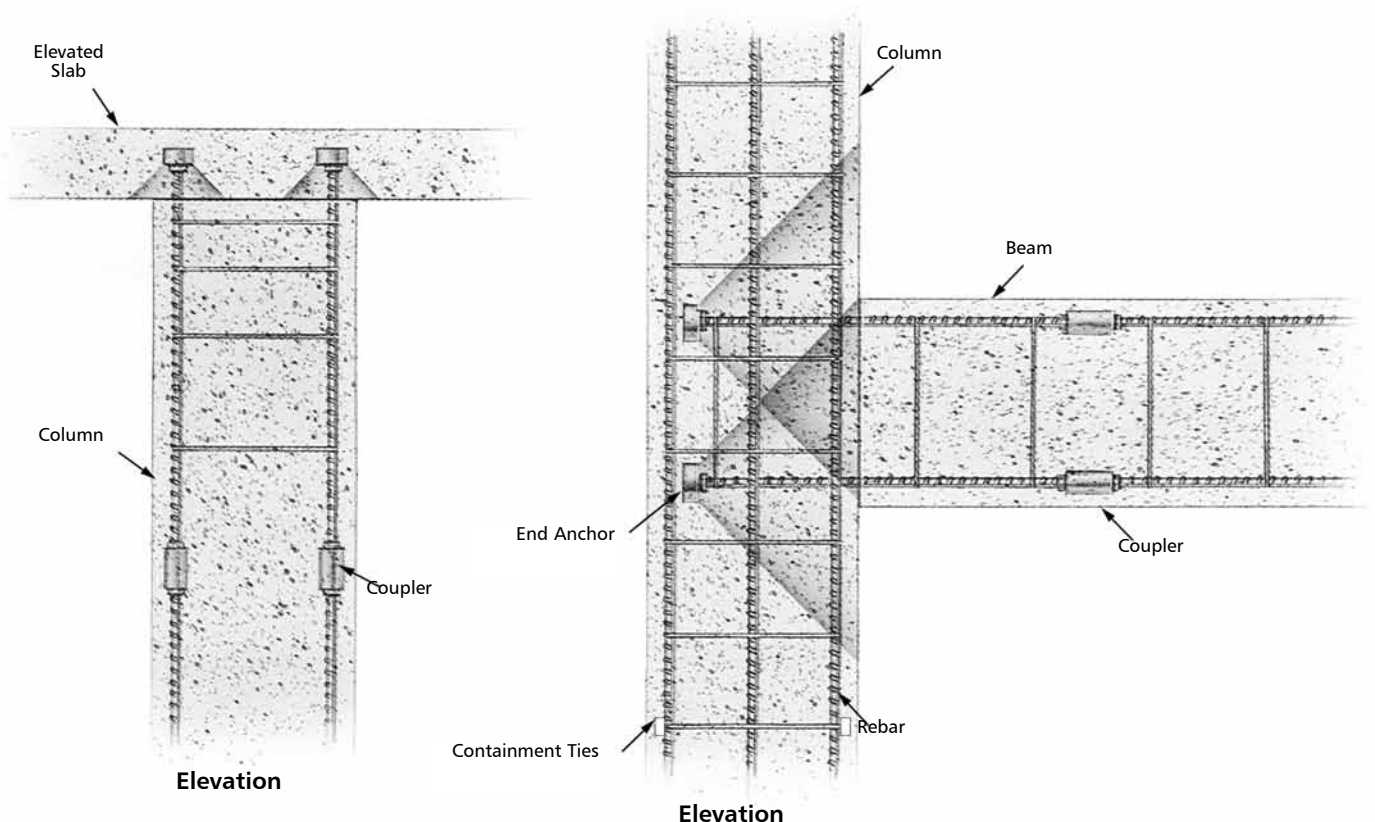
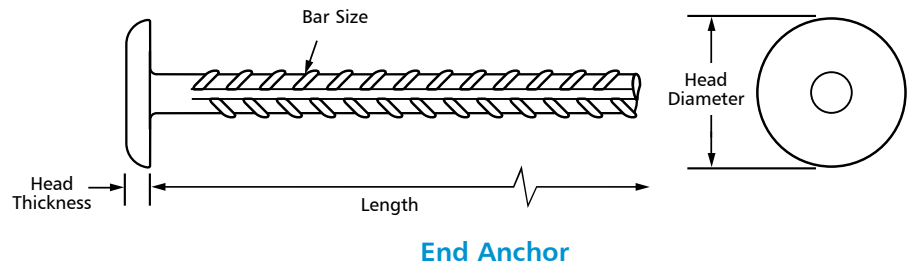
The system also has a two-piece threaded version of the end anchor, available in bar sizes #4 through #18. The two-piece version can be used effectively in situations where installation restrictions require a two-piece unit.

The Dayton Superior End Anchorage System provides a full ductile behavior mode developing ultimate strength capacity of the bars and can be effectively used for end anchoring, stirrup replacements, continuous splicing and heavy anchorage of light standards and other signage.

### End Anchorage

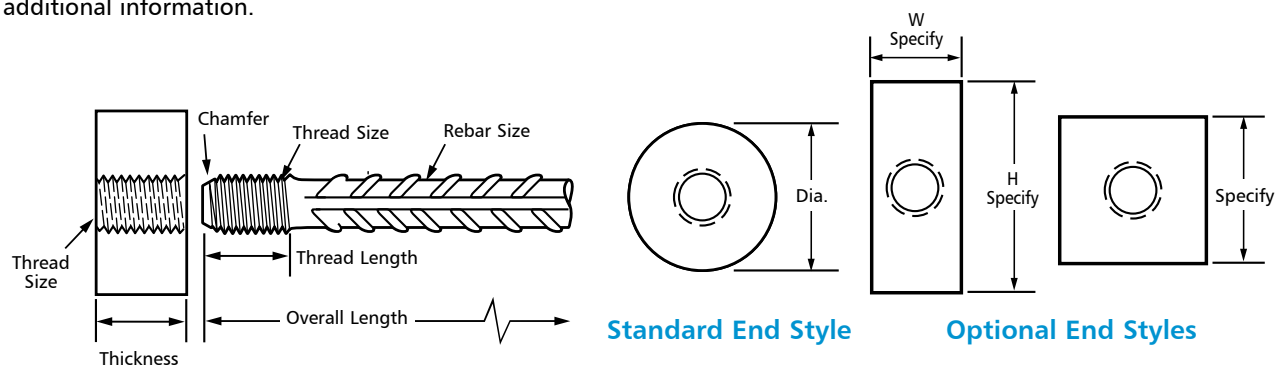
#### Advantages:

- Eliminates rebar congestion and aids in concrete placement.
- Eliminates the need for hooked rebar.
- Reduces engineering design time.
- Provides ultimate capacities and simplifies load paths.
- Improves safety related issues on the job site by reducing protruding dowels.
- Conforms to ASTM A-970.



## D-158 Two-Piece End Anchor

The Dayton Superior D-158 Two-Piece End Anchor consists of a Dowel-In, or splice bar, and a round, square or rectangular anchor plate. The two-piece unit is available in bar sizes #4 through #18 and in various configurations, such as plain, female end, male end and double-ended. The two-piece unit is used effectively for many end anchorage applications where installation restrictions or congestion require the two piece version. The D-158 anchor is available in plain or epoxy coated finish. Alternate anchor plate diameters are available. Contact Dayton Superior Technical Service Department for additional information.



**D-158 Two-Piece End Anchor**

Bar Size Designation			Thread Size	Thread Length	Bar Area (sq. in.)	Minimum Plate Area (sq. in.)	Minimum Plate Thickness	Available End Sizes (Dia.)	Ultimate Strength*
US	Metric (mm)	CN (M)							
#4	[13]	[10]	5/8"-11 UNC	.875"	.200	2.000	.438"	1.6"	19,200 lbs.
#5	[16]	[15]	3/4"-10 UNC	1.000"	.310	3.100	.500"	2.0"	29,760 lbs.
#6	[19]	[20]	7/8"-9 UNC	1.125"	.440	4.440	.563"	2.4"	42,400 lbs.
#7	[22]	—	1"-8 UNC	1.250"	.600	6.000	.625"	2.8"	57,600 lbs.
#8	[25]	[25]	1-1/8"-8 UN	1.375"	.790	7.900	.625"	3.2"	75,840 lbs.
#9	[29]	[30]	1-1/4"-8 UN	1.500"	1.000	10.000	.688"	3.6"	96,000 lbs.
#10	[32]	—	1-7/16"-8 UN	1.688"	1.270	12.700	.750"	4.0"	121,920 lbs.
#11	[36]	[35]	1-9/16"-8 UN	1.813"	1.560	15.600	.813"	4.5"	149,760 lbs.
#14	[43]	[45]	1-7/8"-8 UN	2.125"	2.250	22.500	1.250"	5.4"	216,000 lbs.
#18	[57]	[55]	2-1/2"-8 UN	2.750"	4.000	40.000	1.625"	7.1"	384,000 lbs.

\*Ultimate Strength based on 160%  $f_y$  specified.

**Compatible With All  
Dayton Superior Splicing Systems**

### To Order:

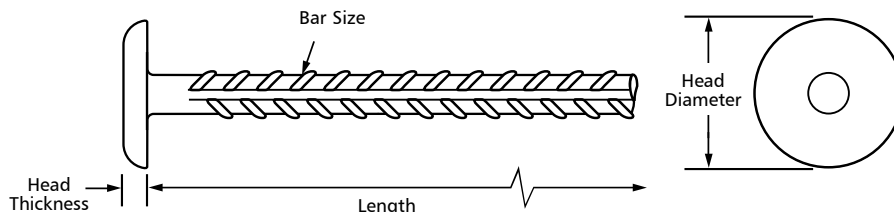
Specify: (1) quantity, (2) name, (3) end style, (4) bar size, (5) overall length.

### Example:

500, D-158 Two-Piece End Anchors, female end, #8 bar x 24" overall length.

## D-158-B Plain End Anchor

The Dayton Superior D-158-B Plain End Anchor is a one-piece, forged-head anchor available in bar sizes #4 through #11. The D-158-B anchor has a plain end and can be furnished in lengths up to 60 feet in plain or epoxy-coated finish.



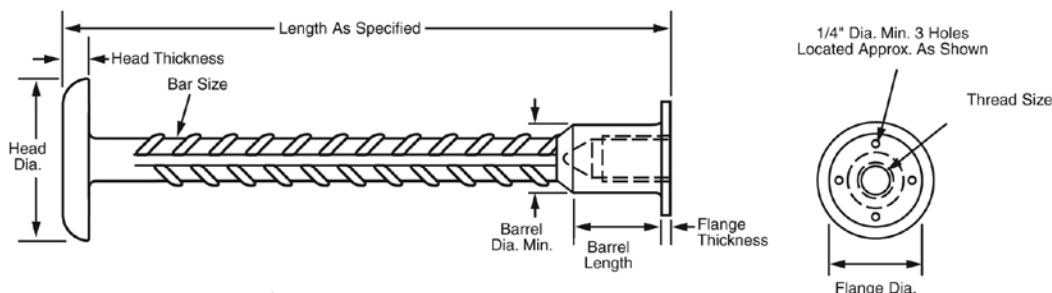
**D-158-B Plain End Anchor (Forged Head)**

Bar Size Designation			Bar Diameter	Head Diameter	Head Thickness	Ultimate Strength*
US	Metric (mm)	CN (M)				
#4	[13]	[10]	.56"	1.596"	.438"	19,200 lbs..
#5	[16]	[15]	.688"	1.987"	.500"	29,760 lbs..
#6	[19]	[20]	.875"	2.367"	.563"	42,400 lbs..
#7	[22]	—	1.000"	2.764"	.625"	57,600 lbs..
#8	[25]	[25]	1.125"	3.172"	.625"	75,840 lbs..
#9	[29]	[30]	1.250"	3.569"	.688"	96,000 lbs..
#10	[32]	—	1.375"	4.022"	.750"	121,920 lbs..
#11	[36]	[35]	1.500"	4.457"	.813"	149,760 lbs..

\*Ultimate Strength based on 160%  $f_y$  specified.  
Minimum Mfg. Length - 10" overall.

## D-158-C Female End Anchor

The Dayton Superior D-158-C Female End Anchor is similar to the plain anchor except that the end is forged into a female end complete with UNC or UN threads and washer face. This version of the end anchor system is used effectively for continuous splicing, heavy anchorage for signs/light standards, etc. The D-158-C anchor is available in bar sizes #4 through #11 in plain or epoxy-coated finish.



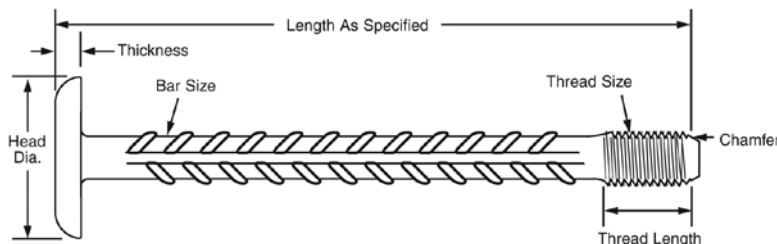
**D-158-C Female End Anchor (Forged Head)**

Bar Size Designation			Head Diameter	Bar Diameter	Thickness	Thread Size	Thread Length	Ultimate Strength*
US	Metric (mm)	CN (M)						
#4	[13]	[10]	1.596"	.500"	.438"	5/8"-11 UNC	.875"	19,200 lbs..
#5	[16]	[15]	1.987"	.625"	.500"	3/4"-10 UNC	1.000"	29,760 lbs..
#6	[19]	[20]	2.367"	.750"	.563"	7/8"-9 UNC	1.125"	42,400 lbs..
#7	[22]	—	2.764"	.875"	.625"	1"-8 UNC	1.250"	57,600 lbs..
#8	[25]	[25]	3.172"	1.000"	.625"	1-1/8"-8 UNC	1.375"	75,840 lbs..
#9	[29]	[30]	3.569"	1.128"	.688"	1-1/4"-8 UNC	1.500"	96,000 lbs..
#10	[32]	—	4.022"	1.270"	.750"	1-7/16"-8 UNC	1.688"	121,920 lbs..
#11	[36]	[35]	4.457"	1.410"	.813"	1-9/16"-8 UNC	1.813"	149,760 lbs..

\*Ultimate Strength based on 160%  $f_y$  specified.  
Minimum Mfg. Length - 10" overall.

## D-158-D Male End Anchor

The Dayton Superior D-158-D Male End Anchor is similar to the D-158-C anchor except that the end is furnished with upsized UNC or UN male threads. The D-158-D anchor is available in bar sizes #4 through #11 in plain or epoxy-coated finish.



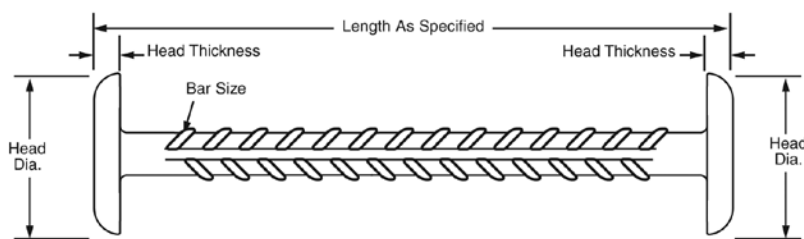
**D-158-D Male End Anchor (Forged Head)**

Bar Size Designation			Head Diameter	Bar Diameter	Thickness	Thread Size	Thread Length	Ultimate Strength*
US	Metric (mm)	CN (M)						
#4	[13]	[10]	1.596"	.500"	.438"	5/8"-11 UNC	.875"	19,200 lbs..
#5	[16]	[15]	1.987"	.625"	.500"	3/4"-10 UNC	1.000"	29,760 lbs..
#6	[19]	[20]	2.367"	.750"	.563"	7/8"-9 UNC	1.125"	42,400 lbs..
#7	[22]	—	2.764"	.875"	.625"	1"-8 UNC	1.250"	57,600 lbs..
#8	[25]	[25]	3.172"	1.000"	.625"	1-1/8"-8 UNC	1.375"	75,840 lbs..
#9	[29]	[30]	3.569"	1.128"	.688"	1-1/4"-8 UNC	1.500"	96,000 lbs..
#10	[32]	—	4.022"	1.270"	.750"	1-7/16"-8 UNC	1.688"	121,920 lbs..
#11	[36]	[35]	4.457"	1.410"	.813"	1-9/16"-8 UNC	1.813"	149,760 lbs..

\*Ultimate Strength based on 160%  $f_y$  specified.  
Minimum Mfg. Length - 10" overall.

## D-158-E Double End Anchor

The Dayton Superior D-158-E Double End Anchor is fabricated with forged heads on both ends of the anchor. The D-158-E anchor can be used effectively in bulkhead areas of heavy rebar congestion. The D-158-E anchor is available in bar sizes #4 through #11 in plain or epoxy-coated finish.



**D-158-E Double End Anchor (Forged Head)**

Bar Size Designation			Head Diameter	Bar Diameter	Thickness	Ultimate Strength*
US	Metric (mm)	CN (M)				
#4	[13]	[10]	1.596"	.500"	.438"	19,200 lbs..
#5	[16]	[15]	1.987"	.625"	.500"	29,760 lbs..
#6	[19]	[20]	2.367"	.750"	.563"	42,400 lbs..
#7	[22]	—	2.764"	.875"	.625"	57,600 lbs..
#8	[25]	[25]	3.172"	1.000"	.625"	75,840 lbs..
#9	[29]	[30]	3.569"	1.128"	.688"	96,000 lbs..
#10	[32]	—	4.022"	1.270"	.750"	121,920 lbs..
#11	[36]	[35]	4.457"	1.410"	.813"	149,760 lbs..

\*Ultimate Strength based on 160%  $f_y$  specified.  
Minimum Mfg. Length - 10" overall.

## Dayton Superior Bar-Lock<sup>®</sup> Coupler System\*

### ICC Evaluation Report No. 2495

The Dayton Superior Bar-Lock Coupler System provides a simple, quick, cost effective method for splicing rebar in tension and/or compression applications. Bar-Lock couplers may be used with plain or deformed bars in sizes #4 through #18.

Bar-Lock couplers utilize lock-shear bolts and special grip rails to mechanically splice with the rebar. The serrated grip rails cradle the rebar and are embedded in the rebar as the lock-shear bolts are tightened. The heads of the lock-shear bolts are designed to shear off at a prescribed torque in order to accomplish proper installation.

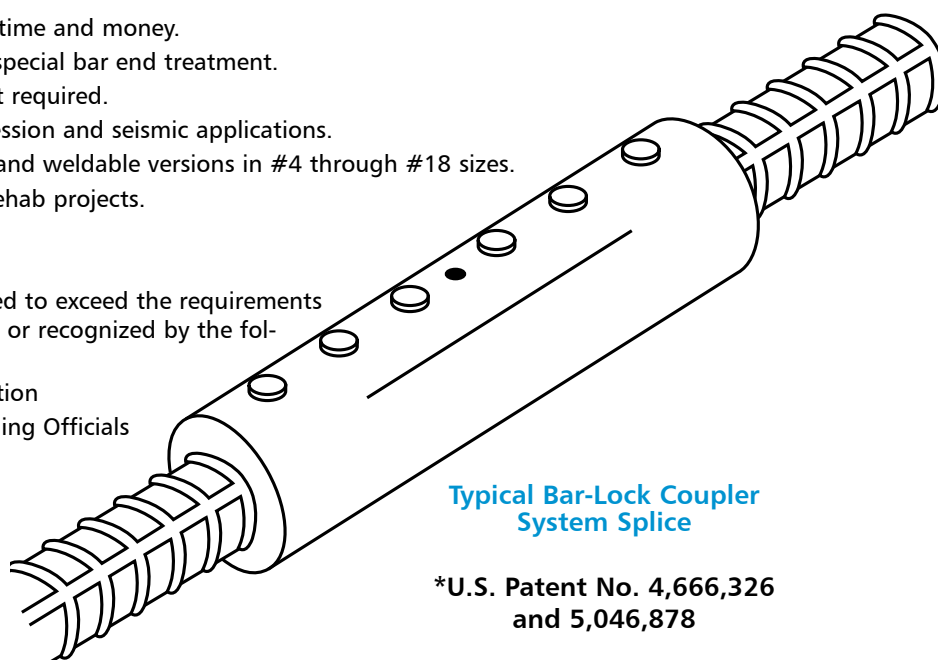
### System Advantages:

- Quick and easy to install – saves time and money.
- Eliminates bar threading and/or special bar end treatment.
- No special installation equipment required.
- High strength in tension, compression and seismic applications.
- Available in standard, transition and weldable versions in #4 through #18 sizes.
- Ideal for new construction and rehab projects.

### System Compliance

Bar-Lock couplers are test-certified to exceed the requirements of, are pre-qualified and approved, or recognized by the following building approval agencies:

- State Departments of Transportation
- International Conference of Building Officials (ICC)
- Building Officials and Code Administrators (BOCA)
- Southern Building Code Congress International (SBCCI)
- American Concrete Institute (ACI)
- Concrete Reinforcing Steel Institute (CRSI)
- City of Los Angeles Department of Building and Safety



Typical Bar-Lock Coupler  
System Splice

\*U.S. Patent No. 4,666,326  
and 5,046,878

Bar-Lock coupler source material is fabricated under ISO9000 quality standards. Bar-Lock couplers are tested by independent, certified testing laboratories in four modes of testing: tension, compression, fatigue and cyclic. All tests are done to the requirements of ICC and/or Caltrans requirements utilizing ASTM A615 grade 60 rebar material. Copies of test reports are available on request.

### Typical Specification

#### Specific:

- Mechanical connections shall be Bar-Lock<sup>®</sup> lockshear bolt couplers as manufactured by Dayton Superior Corporation.

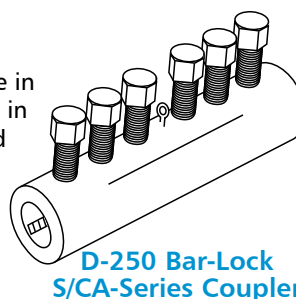
#### Generic:

- The mechanical connection shall meet building code requirements of developing in tension and compression as required by \_\_\_\_\_ (insert name here). The mechanical connection shall be the positive butt splices utilizing lock shear bolts and internal serrated grip rails within the coupling sleeve manufactured from high quality steel. All couplers shall be installed per the manufacturer's approved procedures.



## D-250 Bar-Lock® S/CA-Series Couplers

The D-250 Bar-Lock S/CA-Series Couplers are designed for use in most tension and compression applications. They are available in rebar sizes #4 through #18 and exceed 135% of specified yield of Grade 60 rebar. S/CA couplers are an approved Caltrans "Service" splice and are recognized by ICC, ACI and most State departments of Transportation. S/CA couplers are available in transition sizes, weldable half couplers.



**To Order:**  
Specify: (1) quantity,  
(2) name, (3) coupler  
designation.

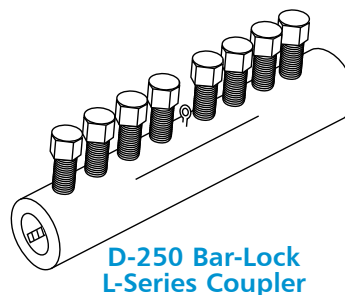
**Example:**  
300, D-250 Bar Lock®  
S/CA-Series Couplers, 8S/CA.

Product Code	Coupler Designation	Bar Size Designation			Barrel Stamp Identification	Tube Specifications			Bolt Specifications			Meets or Exceeds			
		US	Metric (mm)	CN (M)		Outside Diameter (in.)	Length (in.)	Weight (lbs.)	Bolt Qty.	Head Size (in.)	Nominal Shear Torque*	Min % Fy	CAL TRANS Service	ICC Type 1	ICC Type 2
400200	4 S/CA	#4	[13]	[10]	4S...CA	1.3	3.9	1.0	2	0.5	40	135	YES	YES	
400201	5 S/CA	#5	[16]	[15]	5S...CA	1.7	4.5	1.8	2	0.5	80	135	YES	YES	
400202	6 S/CA	#6	[19]	[20]	6S...CA	1.9	6.3	3.5	3	0.5	80	135	YES	YES	
400203	7 S/CA	#7	[22]	—	7S...CA	1.9	8.0	4.1	4	0.5	80	135	YES	YES	
400204	8 S/CA	#8	[25]	[25]	8S...CA	2.2	10.2	7.6	4	0.625	180	135	YES	YES	
400205	9 S/CA	#9	[29]	[30]	9S...CA	2.9	9.0	11.4	3	0.75	280	135	YES	YES	
400206	10 S/CA	#10	[32]	—	10S...CA	2.9	11.5	15.5	4	0.75	350	135	YES	YES	
400207	11 S/CA	#11	[36]	[35]	11S...CA	3.1	14.0	20.5	5	0.75	350	135	YES	YES	
400208	14 S/CA	#14	[43]	[45]	14S...CA	3.5	16.5	26.0	6	0.75	350	135	YES	YES	
400209	18 S/CA	#18	[57]	[55]	18S...CA	4.3	27.1	60.0	10	.75	475	135	YES	YES	

\*Foot pounds. \*S/CA Couplers should not be used in conjunction with epoxy-coated rebar. The L-series should be used for epoxy-coated rebar applications.

## D-250 Bar Lock L-Series Couplers

The D-250 Bar-Lock L-Series Coupler is similar to the Standard Coupler but is designed for use when higher loads are required, such as extreme tension/compression application and/or seismic loading conditions. L-Series couplers are available in rebar sizes #4 through #14 and exceed 160% of specified yield of Grade 60 rebar. L-Series couplers are approved for use by most state DOTs, are recognized as an ICC Type 2 seismic splice, and meet ACI specifications. L-Series couplers are also available in transition sizes, weldable half couplers and epoxy coated.



**To Order:**  
Specify: (1) quantity, (2)  
name, (3) coupler designa-  
tion, (4) if epoxy coating is  
required.

**Example:**  
100, D-250 Bar Lock®  
L-Series Couplers, 8L, epoxy  
coated.

Product Code		Coupler Designation	Bar Size Designation			Barrel Stamp Identification	Tube Specifications			Bolt Specifications			Meets or Exceeds			
			US	Metric (mm)	CN (M)		Outside Diameter (in.)	Length (in.)	Weight (lbs.)	Bolt Qty.	Head Size (in.)	Nominal Shear Torque*	Min % Fy*	CAL TRANS Service	ICC Type 1	ICC Type 2
400226	400235	4 L	#4	[13]	[10]	4L....	1.3	5.5	1.6	3	0.5	40	160	YES	YES	YES
400227	400236	5 L	#5	[16]	[15]	5L....	1.7	6.3	2.8	3	0.5	80	160	YES	YES	YES
400228	400237	6 L	#6	[19]	[20]	6L....	1.9	8.0	4.5	4	0.5	80	160	YES	YES	YES
400229	400238	7 L	#7	[22]	—	7L....	1.9	9.8	5.5	5	0.5	80	160	YES	YES	YES
400230	400239	8 L	#8	[25]	[25]	8L....	2.2	12.3	9.5	5	0.625	180	160	YES	YES	YES
400231	400240	9 L	#9	[29]	[30]	9L....	2.9	11.5	15.5	4	0.75	280	160	YES	YES	YES
400232	400241	10 L	#10	[32]	—	10L....	2.9	14.0	19.5	5	0.75	410	160	YES	YES	YES
400233	400242	11 L	#11	[36]	[35]	11L....	3.1	16.5	24.0	6	0.75	410	160	YES	YES	YES
400234	400243	14 L	#14	[43]	[45]	14L....	3.5	19.1	32.0	7	0.75	410	160	YES	YES	YES

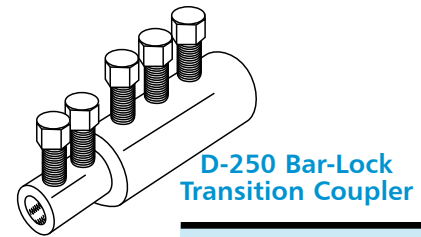
\*Foot pounds.

\*\* When used in conjunction with epoxy-coated Grade 60 rebar, 135% F<sub>y</sub> strength is developed.



## Bar-Lock® Transition Couplers

Bar-Lock Transition Couplers are used to splice two rebar of different diameters. Transition couplers are available in S/CA Series, L-Series and epoxy coated. Note sizes and other information about the respective coupler versions above.



**D-250 Bar-Lock Transition Coupler**

Bar Size Designation			Side A (small side)				Side B (large side)				Total Length
US	Metric (mm)	CN (M)	Barrel Size	Length (in.)	Bolt Qty.	Head Size (in.)	Barrel Size	Length (in.)	Bolt Qty.	Head Size (in.)	
#4	[13]	[10]	#4	2.22	2	0.5	5	2.53	8	0.5	4.75
#5	[16]	[15]	#6	3.15	3	0.5	6	3.15	3	0.5	6.30
#6	[19]	[20]	#7	5.08	3	0.5	8	5.08	4	0.625	10.16
#7	[22]	—	#8	5.33	3	0.625	10	6.00	4	0.75	11.33
#8	[25]	[25]	#9	5.75	4	0.75	10	5.75	4	0.75	11.50
#9	[29]	[30]	#11	7.01	5	0.75	11	7.01	5	0.75	14.02
#10	[32]	—	#10	6.00	4	0.75	14	8.52	6	0.75	14.52
#11	[36]	[35]	#11	7.26	5	0.75	14	8.52	6	0.75	15.75
#14	[43]	[45]	#14	8.52	6	0.75	18	13.83	10	0.75	22.35

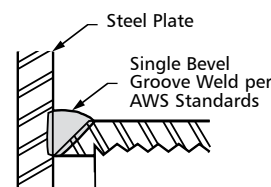
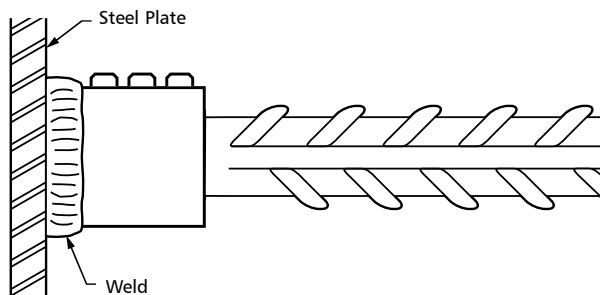
This table lists commonly ordered transition sizes. Other sizes available. Transition Couplers are available in S/CA-Series (shown above) sizes #4-#18 and in L-Series in sizes #4-#14.

**To Order:**  
Specify: (1) quantity, (2) name, (3) transition size, (4) if epoxy coating is required.

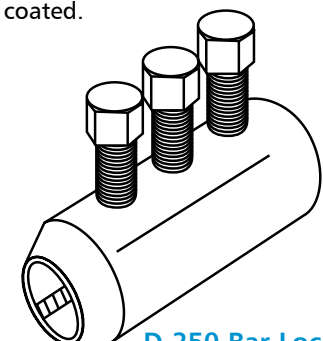
**Example:**  
100, D-250 Bar-Lock® L-Series Transition Couplers, #7-#8, epoxy coated.

## D-250 Bar-Lock Structural Steel Connectors

Bar-Lock Structural Steel Connectors (weldable half couplers) are designed to provide welded connections to structural steel members such as piles, weld plates, beams, columns, etc. Structural Steel Connectors are fabricated with a 45° chamfer to facilitate the welding operation. They are available in rebar sizes #4 through #18 in the S/CA-Series and #4 through #14 in the L-Series. Structural Steel Connectors are available in black and epoxy coated.



**Weld Detail**



**D-250 Bar-Lock Structural Steel Connector**

Bar Size Designation			S/CA-Series			L-Series		
US	Metric (mm)	CN (M)	Structural Steel Connector Designation	Finished Length with Chamfer (in.)	Coupler Outside Diameter (in.)	Structural Steel Connector Designation	Finished Length with Chamfer (in.)	Coupler Outside Diameter (in.)
#4	[13]	[10]	#4-SCA	2.7	1.3	#4-L	3.5	1.3
#5	[16]	[15]	#5-SCA	3.0	1.4	#5-L	3.9	1.4
#6	[19]	[20]	#6-SCA	3.9	1.6	#6-L	4.75	1.6
#7	[22]	—	#7-SCA	4.75	1.6	#7-L	5.65	1.6
#8	[25]	[25]	#8-SCA	5.85	2.2	#8-L	6.85	2.2
#9	[29]	[30]	#9-SCA	5.25	2.6	#9-L	6.5	2.6
#10	[32]	—	#10-SCA	6.5	2.6	#10-L	7.75	2.6
#11	[36]	[35]	#11-SCA	7.75	3.1	#11-L	9.0	3.1
#14	[43]	[45]	#14-SCA	9.0	3.5	#14-L	10.3	3.5
#18	[57]	[55]	#18-SCA	14.3	4.3	—	—	—

Ultimate strength depends on the strength of the field weld and the material to which the coupler is welded.

**To Order:**  
Specify: (1) quantity, (2) name, (3) size.

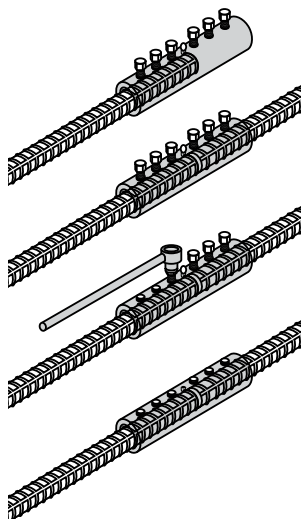
**Example:**  
300, D-250 Bar-Lock® Structural Steel Connectors, #7-SCA.

## Typical Bar-Lock® Coupler Installation

Bar-Lock couplers are easy to install and normally do not require any special training or rebar preparation. A typical installation procedure is as follows:

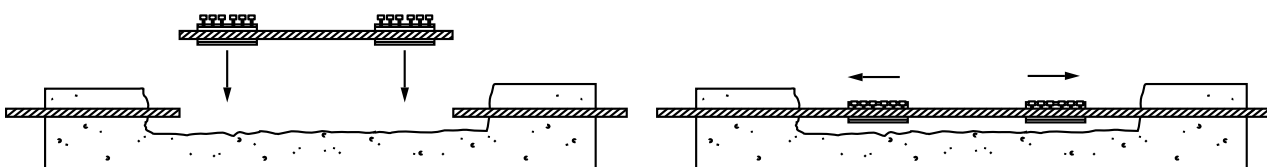
### A. Procedure:

1. Insert end of the first bar halfway into the coupler to the center pin. Hold bar in place and hand-tighten all bolts.
2. Insert end of the second bar halfway into the coupler to the center pin. Hold bar in place and hand-tighten all bolts.
3. In a random alternating pattern, tighten all bolts to approximately 50% of the specified bolt torque value.
4. In a random alternating pattern, tighten all bolts to approximately 75% of the specified bolt torque value.
5. Tighten all bolts in a random alternating pattern until all bolt heads shear off.



### IMPORTANT NOTES:

- a. Prior to bolt tightening the serrated rails **MUST** remain aligned in the same position as they were manufactured. If damaged or knocked out of alignment while positioning, installation **MUST** cease and a new coupler used to replace damaged coupler.
- b. Bolt tightening **MUST** be done in a random alternating pattern similar to tightening the lug nuts on an automobile wheel (i.e., 2-4 - 1-3).



Typical replacement of corroded or damaged rebar in existing concrete.

### Testing

Bar-Lock source materials are fabricated under ISO9001 quality standards. Bar-Lock couplers are tested by independent, certified testing laboratories in four modes of testing: tension, compression, fatigue and cyclic. All tests are done to the requirements of ICC and/or Caltrans utilizing ASTM A615 grade 60 and A706 grade 60 rebar material. Copies of test reports are available on request.

### Epoxy-Coated Rebar Applications

Bar-Lock L-Series couplers should be used in conjunction with epoxy-coated rebar. When used with epoxy-coated Grade 60 rebar 135%  $F_y$  strength is developed. To achieve 160%  $F_y$  strength when using an L-Series coupler with epoxy-coated rebar, the epoxy must be completely removed from the rebar in the region where the coupler engages the rebar.

### B. Installation Tools:

A high-quality 1" - drive pneumatic impact wrench is required for sizes #8 thru #18. The requirements for air flow is 100 psig of operating pressure and 185 cfm of delivered air to the impact wrench through a 3/4" - 1" air hose. Sizes #4 thru #7 may be installed with smaller impact wrenches.

### C. Answers to frequently asked questions:

**1. Approvals:** Bar-Lock couplers exceed the requirements of the Uniform Building Code and state DOT's and are recognized by ICC report #ESR-2495.

**2. Center-pin:** Bar-Lock couplers are manufactured with a removable center-pin for easy reference to the center of the coupler. As each bar is inserted into the coupler it will butt against the center pin providing the confirmation the rebar is inserted the proper distance within the coupler. The bar ends might not actually butt against one another.

**3. Serrated rails:** The internal grip rails are held into place by a simple "positional weld" only. During bolt tightening it is common this positional weld may break loose, but this will not affect performance.

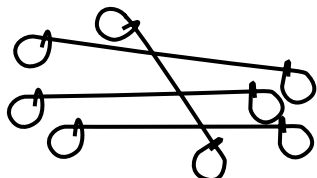
**4. Shear bolts:** The shearing of the bolt-heads simply confirms adequate torque has been achieved.

**5. Bar-ends:** The rebar may be shear cut, flame cut or sawn and generally require no special bar-end preparation for use with Bar-Lock couplers.

## D-42 Bag Ties

The Dayton Superior D-42 Bag Ties are 16 gauge annealed loop-ended wire ties used for tying rebar and many other non-construction items such as bags and carpet rolls. Bag ties are stocked in 4", 5", 6", 7", 8", 10" and 12" lengths. Other lengths and gauges are available on special order. 4" through 8" bag ties are packaged in coils of 1,000 pieces, five coils per bag. 10" and 12" bag ties are packaged 2,500 pieces per bag.

D-42 Bag Ties



### To Order:

Specify: (1) quantity (sold by bag and/or skid only), (2) name, (3) length.

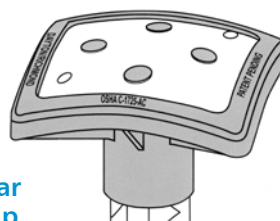
### Example:

5 bags, D-42 Bag Ties, 6" long.

## D-45 Rebar Safety Cap

- Protects workers from protruding rebar
- Impalement protection
- One size fits #4 through #9 rebar
- Safety orange color
- Fully tested and approved (OSHA #C-1725-AC)
- Meets Cal OSHA max. drop test requirements
- Complies with Cal OSHA, Section 1712

D-45 Rebar Safety Cap



## D-46 Tie Wire

The Dayton Superior D-46 Tie Wire is 16 gauge, black annealed wire used to tie reinforcing steel. This soft, pliable wire is available in 3.5 pound coils with 385 feet of wire in each coil. Packaged twenty coils per carton and 48 cartons per skid.

D-46 Tie Wire



### To Order:

Specify: (1) quantity (sold by carton and/or skid only), (2) name.

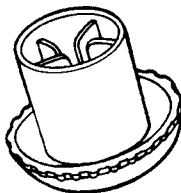
### Example:

5 cartons, D-46 Tie Wire.

## D-48 Sure-Guard Rebar Protective Cap

The Dayton Superior D-48 Sure-Guard Rebar Protective Caps have been developed to protect workmen from the hazards of protruding rebar. The D-48 cap is available in all rebar sizes, and packaged in bags of 50.

D-48 Sure-Guard Rebar Protector



### To Order:

Specify: (1) quantity, (2) name, (3) bar size.

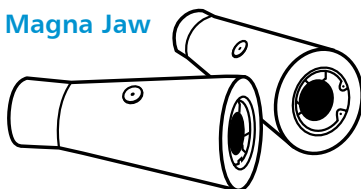
### Example:

600, D-48 Sure-Guard Rebar Protective Caps for #6 rebar.

## D-49 Magna Jaw

The Dayton Superior D-49 Magna Jaw is designed to speed Dowel-In or splice bar installation time. The D-49 Magna Jaw fits a 3/4" drive impact wrench and accommodates #4 through #8 rebar and 1/2" through 1" threaded bars. The tool automatically grips the bar and spins it into place, eliminating hand or wrench turning and greatly reducing installation time.

D-49 Magna Jaw



### To Order:

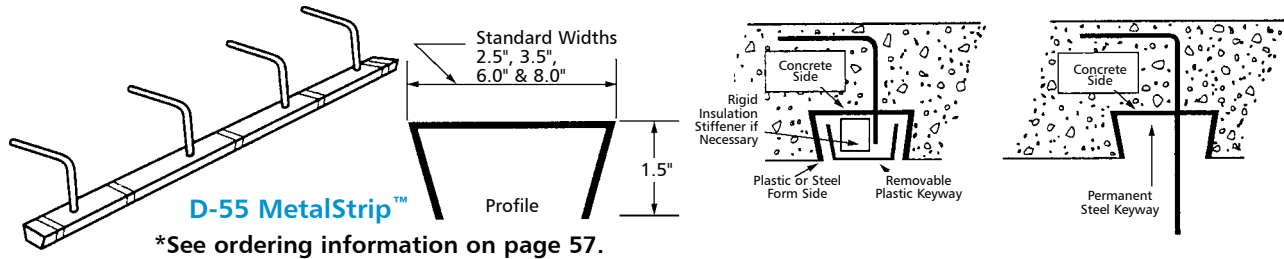
Specify: (1) quantity, (2) name.

### Example:

6, D-49 Magna Jaws.

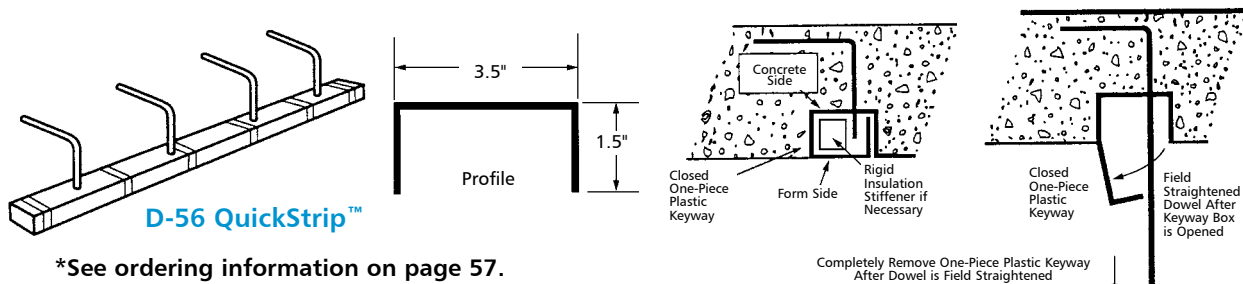
## D-55 MetalStrip™

The Dayton Superior D-55 MetalStrip™ is a two-piece, prepackaged dowel bar keyway strip available in standard 48" lengths and 2-1/2", 3-1/2", 6" and 8" standard widths. The D-55 keyway is designed to stay in place. The ends are typically enclosed with duct tape or rigid insulation plugs. The D-55 keyway comes prepackaged with #4 or #5 ASTM A706 grade 60 bendable rebar shaped to job specifications.



## D-56 QuickStrip™

The Dayton Superior D-56 QuickStrip™ is a one-piece plastic box, prepackaged dowel bar keyway strip. The D-56 keyway standard size is 1-1/2" deep, 3-1/2" wide and 48" long; other thicknesses and widths may be special ordered. The one-piece body is designed to be completely removed from the concrete to leave a clean keyway. The ends are usually closed with duct tape or rigid insulation plugs. The D-56 keyway is available with #4 or #5 ASTM A706 grade 60 bendable rebar configured to job specifications.



## Proper Straightening Procedures

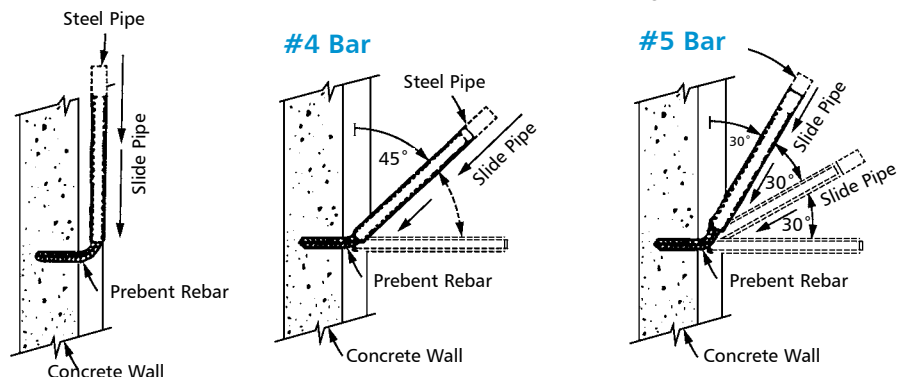
**IMPORTANT:** The probability of rebar breaks and cracks during straightening increases with cold bar temperatures and impact. User can significantly decrease the potential incidence of bar breaks or cracks when straightening if:

- The bar is free of frost and its temperature is above freezing.
- The bars are straightened with a proper inside diameter pipe in a 2 step process as described below.

**STEP 1.** Pry out 90° prebent rebar enough to allow steel pipe to slide over it. In some cases a crowbar may be necessary. Push pipe as tight as possible against factory bend. **DO NOT ATTEMPT TO RE-STRAIGHTEN REBAR WITHOUT PIPE!**

**STEP 2.** Once the pipe is as tight as possible against the factory bend, the rebar can be straightened using the pipe. Continue straightening until the position of #4 bars reach approximately 45° and the position of #5 bars reach approximately 30°. Then slide the pipe tight against the factory bend again and continue to bend #4 bars through another 45° and #5 bars through another 30°. The #4 bars will then be straightened, while the process described above needs to be repeated through another 30° for #5 bars. If properly executed, these procedures should result in offsets or kinks in the bend region between one-half and three-quarters of a bar diameter.

**IMPORTANT:** Proper field-restraightening procedures require that workmen have a firm footing from which to apply straightening pressure. A firm base is, of course, also important to reduce risk of injury if the bar would suddenly break during straightening.



## How to Order D-55 MetalStrip™ and D-56 QuickStrip™

Legend	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Example	48	D-55	2	#4	8"	1.5"	2	L	G	6.6"	1.5"	48"	10"	16"	8"	—
Example	65	D-56	1	#5	12"	1"	—	L	C	3.5"	1.5"	48"	9"	20"	10"	—

**A) Quantity** Number of Pieces

**B) Product Name** D-55 MetalStrip™ D-56 QuickStrip™. All metal strips can be provided. Please note under Special Features.

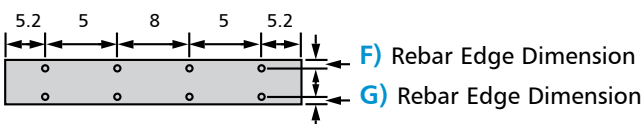
**C) Number of Rebar Lines** Positioned as follows, unless noted as a Special Feature (SF)

**D) Rebar Size** Available in #4 and #5 U.S.A. Made Grade 60 rebar with enhanced field rebendability

**E) Rebar Spacing (inches)** No limitations on rebar spacing.

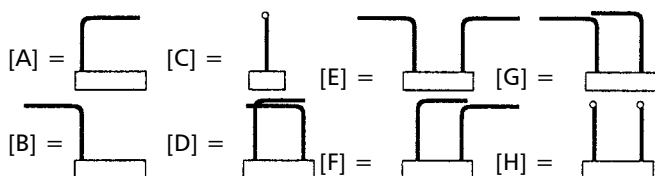
**F) and G) Rebar Edge Dimension(s)** Each dimension is between the bar hole centerline and keyway edge. (The standard dimension is 1".) Use letter "C" to indicate hole should be centered in keyway width.

**E) Rebar Spacing**



**H) Anchor Shape** **Anchor Shape Legend**  
 "J" = AC1 180° STD Hook Geometry  
 "L" = AC1 90° STD Hook Geometry  
 "I" = Straight Bar  
 "S" = Special Anchor Configuration  
 [As specified by engineer and noted as Special Feature(SF)]

**I) Anchor Direction** **Anchor Direction Legend**



**J) Keyway Strip** D-55 MetalStrip™ available in standard widths of 2.5", 3.5", 6.0" and 8.0"

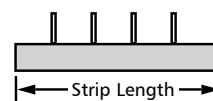
**Width (inches)** D-56 QuickStrip™ available in 3.5" standard width.

**K) Keyway Strip** Typically 1.5".

**Depth (inches)**

**L) Keyway Strip** Standard length 48".

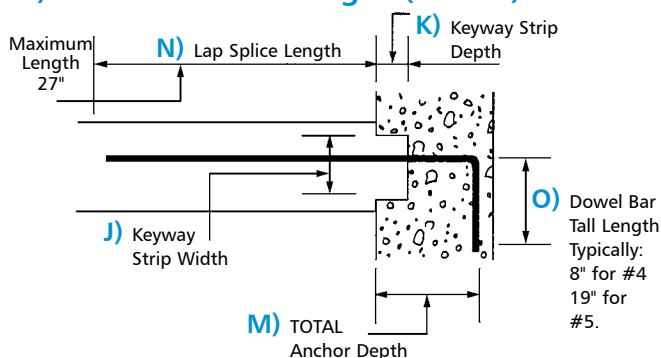
**Length (inches)**



**M) Total Anchor Depth (inches)** Includes keyway depth

**N) Lap Splice Length (inches)**

**O) Dowel Bar Tall Length (inches)**



**P) Special Features** SF (Limited availability)

## P-154 DB Attachment Magnet

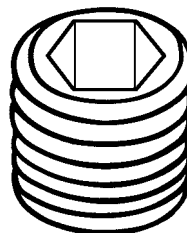
The P-154 Attachment Magnet can be used to attach a DB, D-50, or D-110 coupler to a metal form. Simply thread the attachment into the coupler, and the magnet will attach to the metal form. Once the concrete has cured, pull the form work from the magnets. The re-usable Attachment Magnets can be removed from the threaded couplers.

Product Code	Coupler Size	Face Diameter	Magnet Thickness	Thread Length	Thread Size
126857	#4	2-1/4"	1"	3/4"	5/8"-11 UNC
128161	#5	2-1/2"	1"	7/8"	3/4"-10 UNC
128162	#6	2-3/4"	1"	1"	7/8"-9 UNC
127769	#7	3"	1"	1-1/8"	1"-8 UNC
128163	#8	3"	1"	1-1/4"	1-1/8"-8 UN
128164	#9	3-1/4"	1"	1-3/8"	1-1/4"-8 UN
128165	#10	3-1/2"	1"	1-1/2"	1-7/16"-8 UN
128166	#11	3-3/4"	1"	1-5/8"	1-9/16"-8 UN



## F-72 Threaded Steel Setting Plug

The Dayton Superior F-72 Threaded Steel Setting Plug eliminates the need for large holes in the form to secure splicing products. The F-72 plug is basically a socket set screw that has been drilled through and tapped with a #8-32 thread. This enables the plug to be nailed to a wood form or bolted to a metal form. The plugs can be easily removed from the splicer with a standard hex wrench and reused as needed. F-72 plugs are available in 3/8", 1/2", 5/8", 7/8" and 1" diameters.



**F-72 Threaded Steel Setting Plug**

### To Order:

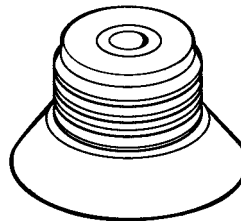
Specify: (1) quantity, (2) name, (3) diameter.

### Example:

100, F-72 Threaded Steel Setting Plugs, 1/2" diameter.

## F-74 Threaded Plastic Setting Plug

The Dayton Superior F-74 Threaded Plastic Setting Plug is similar to the F-72 plug with the exception of its plastic construction. The plug can be used to seal female splicing threads and to set the splicer in the form. F-74 plugs are available in 3/8" through 1" diameters.



**F-74 Threaded Plastic Setting Plug**

### To Order:

Specify: (1) quantity, (2) name, (3) diameter.

### Example:

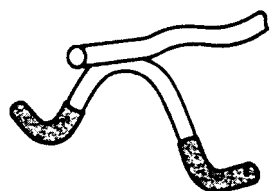
400, F-74 Threaded Plastic Setting Plugs, 5/8" diameter.



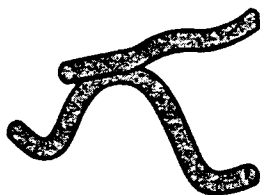
## Supports for Rebar and Wire Mesh

Dayton Superior manufactures a complete line of rebar and/or mesh supports. All Dayton Superior rebar supports are manufactured to the recommendations or specifications of the Concrete reinforcing Steel Institute (CRSI). Supports are available bright basic, plastic protected, epoxy coated and stainless steel for various corrosion resistance protection.

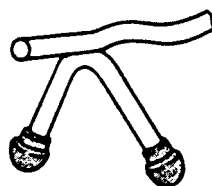
Dayton Superior rebar supports are shipped in convenient cartons, bundles or on skids and are clearly identified.



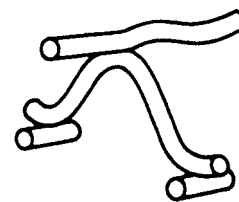
Baked on Plastic Feet



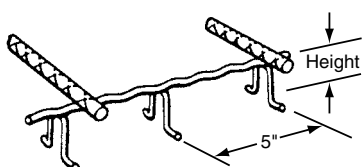
Epoxy-Coated



Plastic Tipped Feet

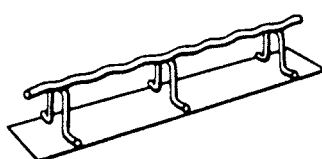


Stainless Steel Tips

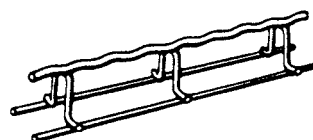


SB-Slab Bolster

Available in heights of 3/4" to 3" in increments of 1/4" in 5 ft. lengths



SBP-Slab Bolster with Plate

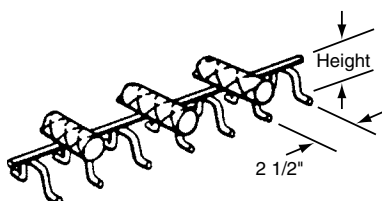


SBU-Slab Bolster Upper

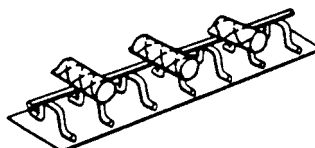


JC-Joist Chair

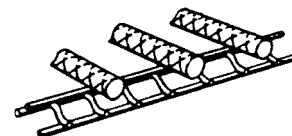
Available in heights of 3/4" 1" and 1-1/2"



BB-Beam Bolster

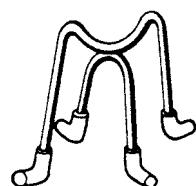


BBP-Beam Bolster with Plate



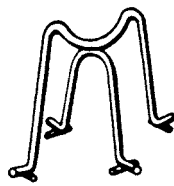
BBU-Beam Bolster Upper

Available up to 5" in height in 1/4" increments. Available in 5' lengths.

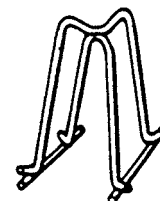


HC-Individual High Chair  
(Plastic Tipped Legs Available)

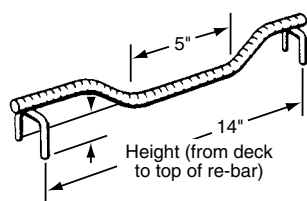
Available in heights of 2" to 40" in increments of 1/4"



HCP-Individual High Chair with Plates

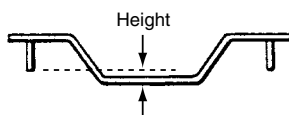


FHC-High Chair for Fill



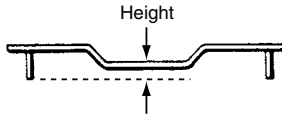
JCU-Joist Chair Upper

Available in heights of -1" to +3-1/2"



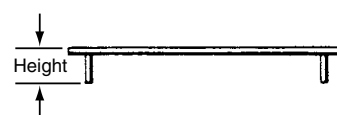
Style 1

From -1/4" to -1"



Style 2

From 0" to +1"



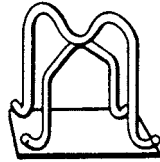
Style 3

From + 1-1/4" to + 3-1/2"





BC-Bar Chair



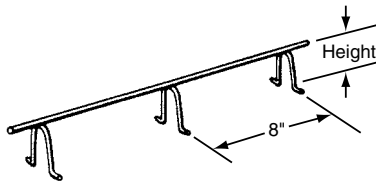
BCP-Bar Chair with Plate

Available in heights of 3/4" 1" and 1-1/2"



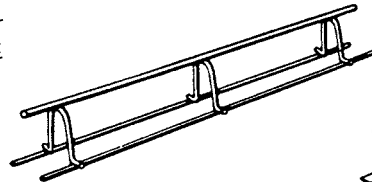
SHC-Special Laced High Chair

Horizontal lace on chair 12" and less. Diagonal cross laces standard on heights over 12"-

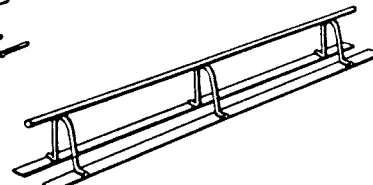


CHC-Continuous High Chair

Available in heights of 2" to 20" in increments of 1/4" in 5' lengths



CHCU-Cont. High Chair Upper

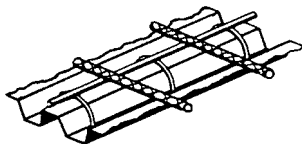


CHCP-Cont. High with Plate  
Manufactured to Order



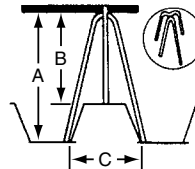
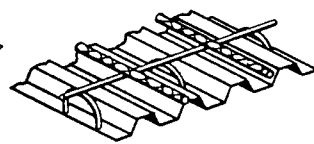
HBC-Heavy Bar Chair

Available in heights of 3/4" 1" and 1-1/2"



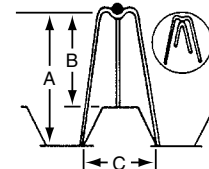
CHC-Continuous High Chairs for Metal Decking

Available in heights of 2" to 9" with leg spacing of 4-1/2" to 10"

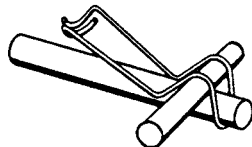


CHC-Continuous High Chairs for Metal Decking

Available in heights of 2" to 9" with leg spacing of 4-1/2" to 10"

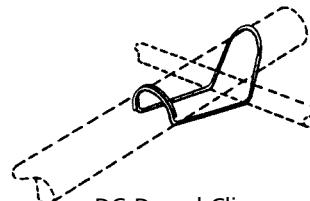


PC-Precast Chair.  
Made from type  
430 Stainless Steel.



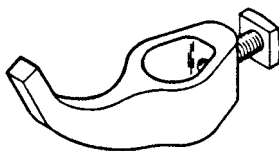
BC-Bar Clip

Available for 1/2" to 1-5/8" bars



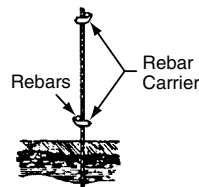
DC-Dowel Clip

Available for 1/2" to 1-5/8" bars

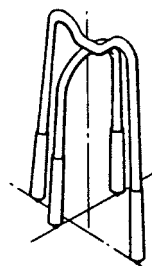


RC-Rebar Carrier

Available for No. 5 and 6 rebar

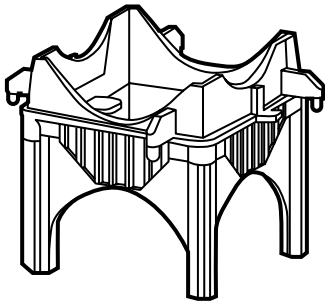


Drive Rebar Support in Ground  
and Attach Rebar Carrier

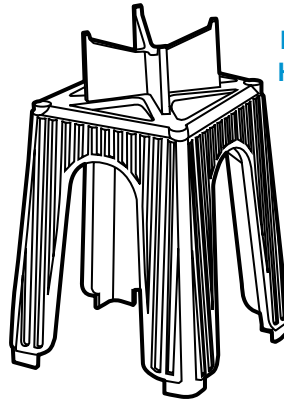


SLHC-Straight Leg  
High Chair

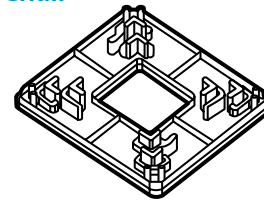
Available in heights of  
2-1/4", 2-1/2" and 2-3/4"



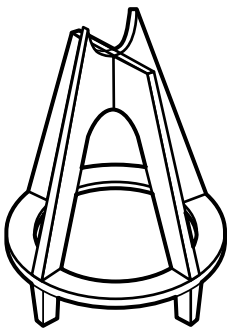
PBC Tower Bar Chair



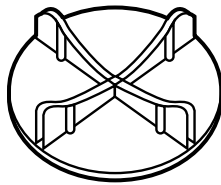
PTC Tower  
High Chair



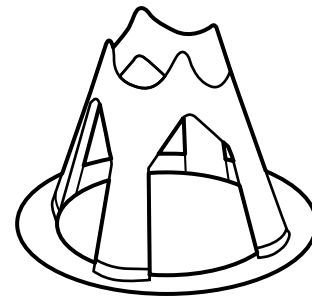
PTCSB Tower Chair  
Sand Plate



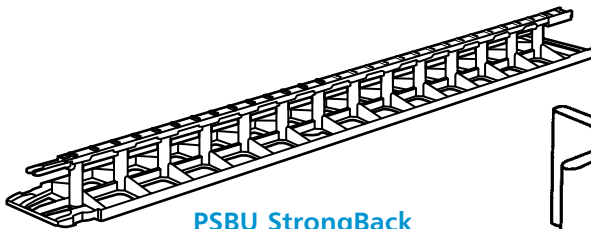
PEZ E-Z Chair



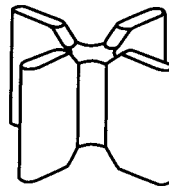
PSP Sand Plate



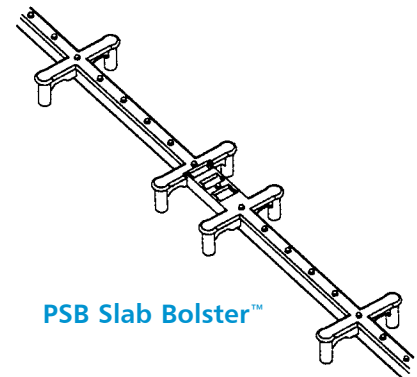
PCC Castle Chair



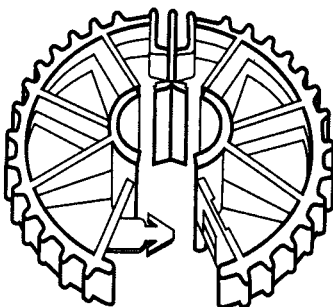
PSBU StrongBack  
SBU™



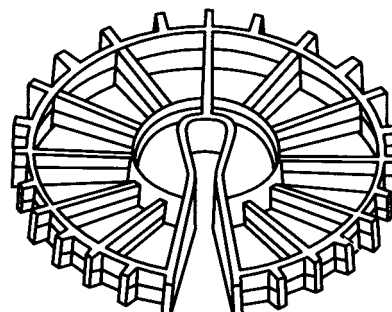
PXC X-Chair



PSB Slab Bolster™



PLW E-Z Lok Wheel



PSW Space Wheel

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## Formliners

Easy to install and easy to strip, Dayton Superior Formliners are available in Single Use, Medium Reuse and Heavy Reuse. Repeat patterns eliminate seam lines.

For complete details, request our full color handbook describing new Formliner products from Dayton Superior, with photos, drawings and architectural specifications. Dayton Superior's Formliners are offered in more than 500 contemporary designs and three weights.



