

CRYOGENIC REBAR SPlicing SYSTEMS



-165°C / -265°F

Cryogenic Rebar Splicing Systems



Cryogenic Rebar Splicing systems are an extension to the LENTON line of concrete reinforcement products available from Pentair. Our products provide the ideal splicing solution for joining rebar in cryogenic applications. By combining the LENTON taper-threaded couplers with state-of-the-art materials we have been able to develop one of the slimmest couplers on the market, while still maintaining top performance. LENTON brand of Cryogenic Rebar Splicing systems should be specified whenever cryogenic-grade rebar is used or when during normal operating or emergency conditions the temperature falls below -20°C (-4°F). Typical construction projects include LNG and LPG storage tanks.

Benefits

- Improved performance and reliability at cryogenic temperatures (-165°C / -265°F)
- Available for a wide range of applications
- Small coupler diameter helps minimize cover and helps eliminate congestion
- Unique taper thread requires no lock nuts and provides a positive locking, no-slip connection
- Requires no special skill and reduces labor costs

Performance

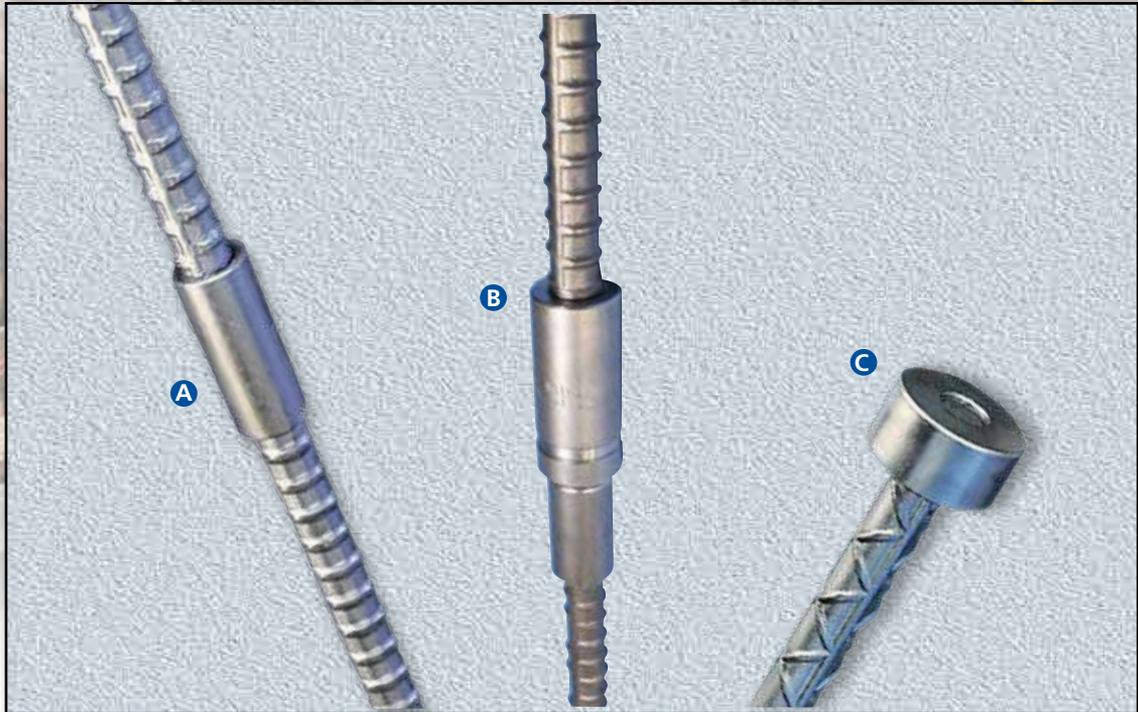
At ambient temperatures, the cryogenic couplers are intended for use in reinforced concrete structures designed and built in accordance with major international building codes such as ACI[®] 318 Types 1 & 2, DIN1045 and BS8110. At cryogenic temperatures the tensile strength of the splice meets or exceeds the yield strength of an unnotched bar. This is known as the Notch Sensitivity Ratio (NSR).*

$$\text{NSR} = \frac{\text{Tensile strength for LENTON brand of Cryogenic Splice}}{\text{Lower yield strength of unnotched bar}} \geq 1$$

Uniform elongation at maximum load on Cryogenic spliced bars is a minimum of 1%.

*Note: In the absence of any current codes governing the use of splicing systems for cryogenic applications we have applied the reinforcing bar test criteria utilized in BS 7777 part 3 and EN 14620-3. Construction codes BS 7777 part 3 and EN 14620-3 are the most often applied standards for the design and construction of flat-bottomed, vertical, cylindrical storage tanks for low temperature service.

Cryogenic Rebar Splicing Systems



The LENTON taper threaded range consists of standard and transition couplers as well as positional couplers and headed bars. Designed to withstand man-made blasts and other seismic events, spliced bars develop higher tensile strength than lap splicing and provide full load transfer with the slimmest and shortest coupler possible. Spliced bars also behave as a continuous length of reinforcing steel and provide full strength in tension, compression and stress reversal applications.

A LENTON Taper Threaded Splices

LENTON brand of standard couplers are some of the slimmest couplers available and their tapered thread makes them the most reliable, easy to install and cost effective system.

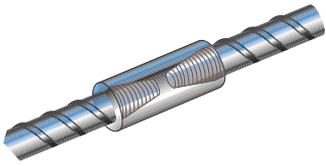
B LENTON Position Couplers

LENTON brand of position couplers are designed to splice two curved, bent or straight bars when neither bar can be rotated. The couplers are quick and easy to install and feature our unique, self-aligning taper-threaded design for continuity and structural integrity.

C LENTON TERMINATOR (Headed Bar)

LENTON TERMINATOR is a taper-threaded anchorage, which is secured to the end of a length of reinforcing steel bar and is capable of creating a more effective anchorage than the traditional hooked rebar. This approach greatly simplifies rebar placement, reduces congestion and improves structural integrity.

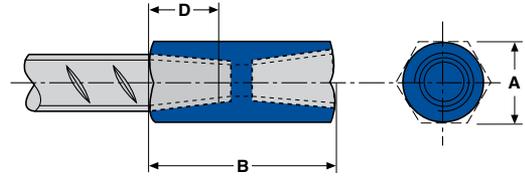
Standard Couplers



LENTON standard couplers are designed to splice the same diameter bars where one bar can be rotated and the bar is not restricted in its axial direction. Reducers / Transitions available upon request.

- A = diameter
- B = length of coupler bar
- D = bar engagement

Meets international standards, including BS8110, DIN1045, ACI®318 type 1 & 2



A12

Rebar Size Designations				Part No.	"A" (Diameter)		"B" (Length)		"D"		Weight	
ASTM	Metric	Canadian	Soft Metric		In.	mm	In.	mm	In.	mm	lb	kg
#4	12	10 M	13	EL12A12CRN	0.75	20	1.96	50	0.75	19	0.2	0.09
	14		14	EL14A12CRN	0.75	20	2.19	56	0.83	21	0.2	0.09
#5	16	15 M	16	EL16A12CRN	1.00	25	2.41	61	0.94	24	0.4	0.16
#6	20	20 M	19	EL20A12CRN	1.25	30	3.41	87	1.38	35	0.8	0.32
#8	25	25 M	25	EL25A12CRN	1.38	35	3.80	97	1.57	40	1.0	0.44
#9	28	30 M	29	EL28A12CRN	1.50	40	3.97	101	1.65	42	1.1	0.61
#10	32		32	EL32A12CRN	1.75	45	4.23	108	1.77	45	1.7	0.79

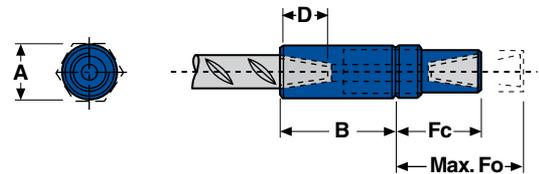
Position Couplers



The P14 style couplers are designed to splice two curved, bent or straight bars, when neither bar can be rotated and where the on-going bar is free to move in its axial direction. Typical applications for these couplers are for the splicing of pile cages. The P14 position coupler can be separated in two pieces for application against form work. Reducers / Transitions available upon request.

- A = diameter
- B = length of coupler body
- D = bar engagement
- Fc = connector and jam nut (closed position) length
- Max. Fo = connector and jam nut (fully open position) length

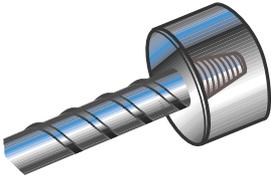
Meets international standards, including BS8110, DIN1045, ACI®318 type 1 & 2



P14

Rebar Size Designations				Part No.	"A" (Diameter Female)		"B" (Length Female)		"Fc"		"Fo" (Max)		"D"		Weight	
ASTM	Metric	Canadian	Soft Metric		In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	lb	kg
#4	12	10 M	13	EL12P14LCRN	1.00	25	1.82	46	2.03	51	2.29	58	0.75	19	0.6	0.27
	14		14	EL14P14LCRN	1.00	25	2.01	51	2.11	54	2.37	60	0.83	21	0.6	0.27
#5	16	15 M	16	EL16P14LCRN	1.25	30	2.13	54	2.26	58	2.53	65	0.94	24	1.1	0.45
#6	20	20 M	19	EL20P14LCRN	1.38	35	2.98	76	3.00	76	3.45	88	1.38	35	1.8	0.78
#8	25	25 M	25	EL25P14LCRN	1.75	45	3.37	86	3.27	83	3.71	95	1.57	40	2.9	1.36
#9	28	30 M	29	EL28P14LCRN	2.00	50	3.36	90	3.81	85	3.81	97	1.65	42	3.9	1.77
#10	32		32	EL32P14LCRN	2.25	60	3.76	96	4.22	96	4.22	107	1.77	45	5.6	2.36

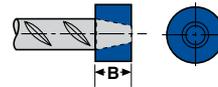
LENTON TERMINATOR



The LENTON TERMINATOR provides an alternative to hooked rebar, or an anchor or stop nut for rebar passing through a pile plank or structural steel element. The front face of the coupler is generously designed to carry the full tension load of the rebar when the anchor is bearing against concrete or structural steel.

A = large diameter
 B = length of coupler body/ bar engagement
 E = length of small step
 F = small diameter

Meets international standards, including BS8110, DIN1045, ACI®318 type 1 & 2 and ASTM® A970.



D16*

Rebar Size Designations				Part No.	"A" (Diameter)		"B" (Length)		Weight	
ASTM	Metric	Canadian	Soft Metric		In.	mm	In.	mm	lb	kg
#4	12	10 M	13	EL12D16CRN	1.38	35	0.73	19	0.3	0.13
	14		14	EL14D16CRN	1.38	35	0.85	22	0.3	0.14
#5	16	15 M	16	EL16D16CRN	1.50	36	0.94	24	0.4	0.16
#6	20	20 M	19	EL20D16CRN	1.88	45	1.38	35	0.8	0.37
#8	25	25 M	25	EL25D16CRN	2.25	60	1.57	40	1.7	0.77
#9	28	30 M	29	EL28D16CRN	2.75	65	1.65	42	2.1	0.94
#10	32		32	EL32D16CRN	3.00	75	1.79	46	3.0	1.35

* Net head bearing area is 4 times the bar area.

Meets international standards, including BS8110, DIN1045, ACI®318 type 1 & 2 and ASTM A970.



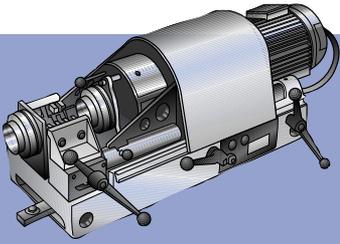
D14**

Rebar Size Designations				Part No.	"A" (Diameter)		"B" (Length)		"E"		"F" Diameter		Weight	
ASTM	Metric	Canadian	Soft Metric		In.	mm	In.	mm	In.	mm			lb	kg
#4	12	10 M	13	EL12D14CRN	1.75	45	0.73	19					0.5	0.22
	14		14	EL14D14CRN	1.75	45	0.85	22					0.6	0.25
#5	16	15 M	16	EL16D14CRN	2.25	55	0.94	24					0.9	0.42
#6	20	20 M	19	EL20D14CRN	2.50	65	1.38	35					1.9	0.85
#8	25	25 M	25	EL25D14CRN	3.25	80	1.57	40					3.2	1.46
#9	28	30 M	29	EL28D14CRN	3.75	95	1.65	42	0.79	20	3.15	80	4.6	2.07
#10	32		32	EL32D14CRN	4.00	105	1.79	46	0.98	25	3.15	80	5.3	2.42

** Net head bearing area is 9 times the bar area.

Standard Bar Threader

LENTON brand of bar threaders can be conveniently set up in a fabricator's shop or on site, allowing greater production control. Machines are available from Pentair worldwide. Training is provided by Pentair instructors.

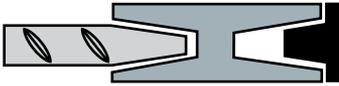


Bar threading machine EL-BT-101 / ELHT100 Net weight 178 kg (392 lbs). Cutting oil capacity 14 liters (3.7 gal).

Bar size Ø	(in-lb) mm	(#3-#5) 10-18	(#6-#9) 20-28	(#10-#14) 30-43
Bar threads per set of chasers (normal average)		600	400	300
Bar threads per liter cutting oil		400	200	100
Guide for threads per hour		70/80	40/50	20/30

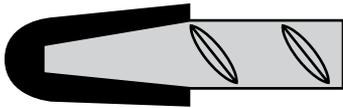
Contact Pentair for further information on our different bar threaders.

LENTON bar threaders are rugged and have performed well under varied conditions in many parts of the world. Truly a "take anywhere" machine for all bar sizes and profiles.



Internal Coupler Protectors*

- Helps protect threads from contamination, such as in future extension applications
- Can be easily removed in seconds
- Enables continuous connections with existing reinforcing bar already placed in concrete
- Convenient and cost effective



Bar End Protectors*

- Helps protect bar end from contamination and damage
- Placed over bar end immediately after threading
- Inhibits the formation of rust when the bar is exposed to the elements

A Look At Concrete Reinforcement Products From Pentair

LENTON has been a pioneer in the concrete construction industry for more than 40 years. We changed rebar splicing, first with CADWELD mechanical connections, then with the LENTON mechanical splicing system – the #1 mechanical connector in the world. Pentair now offers a wide range of mechanical splices for almost any construction need:



- **CADWELD** – Premiere mechanical splicing system
- **LENTON FORM SAVER** – Ideal for segmental pour
- **LENTON INTERLOK** – Ideal for precast structures
- **LENTON QUICK WEDGE** – Ideal for quick retrofit
- **LENTON SPEED SLEEVE** – Ideal for compression situations
- **LENTON TERMINATOR** – Ideal alternative to hooked rebar anchorage
- **LENTON LOCK** – Ideal for in-situ splices

The entire LENTON line of mechanical rebar splices has replaced many conventional splicing systems, such as welding and lap splicing. Unlike butt welding, LENTON products require no special training or external power source, are quicker to install and inspect, reduce crane time, improve the tensile strength of the splice and can be installed in any weather.

As your rebar splicing specialist, LENTON offers you the expertise you need for all your rebar splicing projects.

Pentair Engineered Electrical & Fastening Solutions is a leading global manufacturer and marketer of superior engineered products for niche electrical, mechanical and concrete applications. These Pentair products are sold globally under a variety of market-leading brands: ERICO welded electrical connections, facility electrical protection, and rail and industrial products; CADDY fixing, fastening and support products; ERIFLEX low voltage power and grounding connections; and LENTON engineered systems for concrete reinforcement.

For more information on ERICO, CADDY, ERIFLEX and LENTON, please visit erico.pentair.com.

LENTON Taper Threaded Mechanical Splices:

How to Order

To order the correct LENTON mechanical splices for your construction applications, please call your local Pentair office. Locations are listed on back cover.

How to Specify

Specific: Mechanical connections shall be LENTON taper threaded couplers as manufactured by Pentair.

Generic: The mechanical connection shall meet building code requirements of developing in tension or compression, as required, by*. 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. Bars shall be installed to the manufacturer's requirements. The couplers shall be manufactured using registered quality systems around the world.

*as required by local norms/codes.

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WARNING

Pentair products shall be installed and used only as indicated in Pentair's product instruction sheets and training materials. Instruction sheets are available at www.erico.pentair.com and from your Pentair customer service representative. Improper installation, misuse, misapplication or other failure to completely follow Pentair's instructions and warnings may cause product malfunction, property damage, serious bodily injury and/or death, and void your warranty.



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