

Taper-Threaded Terminators and Mechanical Anchors

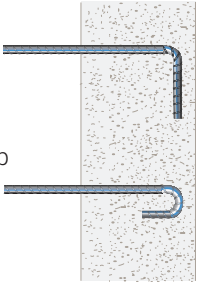
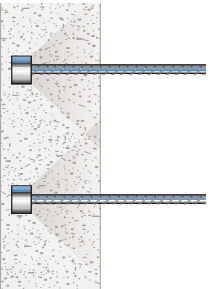




Gran Torre Santiago, Chile

Hooked Rebar Anchorage vs. nVent LENTON Taper-Threaded Terminator

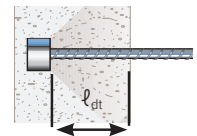
For many years, the traditional method of providing shear reinforcement and connecting roof/column and beam/column connections has been with hooked rebar anchorage. Many structural engineers, architects and specifiers have discovered this method of anchorage has very few advantages. Terminators, often called headed bars, create an anchorage within the concrete, simplifying placement and reducing congestion. Explore the reasons to consider the nVent LENTON Taper-Threaded Terminator—an efficient alternative for hooked rebar anchorage.

WHICH SYSTEM IS MORE RELIABLE AND ECONOMICAL?

Hooked Rebar Anchorage	nVent LENTON Taper-Threaded Terminator
<ul style="list-style-type: none"> Requires longer development lengths <ul style="list-style-type: none"> Increases rebar congestion Restricts flow of larger aggregates Hidden costs <ul style="list-style-type: none"> The larger the bar, the longer the lap Inhibits rebar placement <ul style="list-style-type: none"> Increases rebar placing costs Jeopardizes job site safety <ul style="list-style-type: none"> Increases safety hazards through exposed rebar Restricts removal of column forms and shaft casings <ul style="list-style-type: none"> Labor intensive 	<ul style="list-style-type: none"> Eliminates rebar hook <ul style="list-style-type: none"> Simplifies bar placement Minimizes development lengths <ul style="list-style-type: none"> Reduces congestion Simplifies concrete placement <ul style="list-style-type: none"> Better concrete consolidation More embedment options <ul style="list-style-type: none"> Greater design flexibility Faster installation <ul style="list-style-type: none"> Lowers in-place cost Standard product dimensions <ul style="list-style-type: none"> Minimal detailing required
	
<p>Vs.</p>	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Reliable</p> </div> <div style="text-align: center;">  <p>Economical</p> </div> </div>	

HOW TERMINATOR WORKS

The nVent LENTON Taper-Threaded Terminator design builds on the extensive testing conducted for headed anchors. Most recently, the American Concrete Institute (ACI®) published Building Code Requirements (318-19) defining the development of headed and mechanically anchored deformed bars in tension (Section 25.4.4). Additionally, the International Building Code (IBC®) references ACI 318.



ASTM A706 and A615 Grade 60 Uncoated Bar					
Development Lengths (l_{dt}) for Headed Rebar (ACI 318-19, 25.4.4), inch					
Bar Size		Concrete Compressive Strength, psi			
ASTM	mm	3,000	5,000	7,500	10,000
#4	12	6	6	6	6
#5	16	6	6	6	6
#6	20	8	7	6	6
#7	22	10	9	8	7
#8	25	12	11	10	8
#9	28	14	13	12	10
#10	32	17	16	14	12
#11	36	20	18	16	14

ASTM A706 and A615 Grade 80 Uncoated Bar					
Development Lengths (l_{dt}) for Headed Rebar (ACI 318-19, 25.4.4), inch					
Bar Size		Concrete Compressive Strength, psi			
ASTM	mm	3,000	5,000	7,500	10,000
#4	12	6	6	6	6
#5	16	8	7	7	6
#6	20	11	10	8	7
#7	22	13	12	11	9
#8	25	16	15	13	11
#9	28	19	17	15	13
#10	32	23	21	18	16
#11	36	27	24	21	18

*Modification factors ψ_e, ψ_p, ψ_o set to 1.0. ψ_c calculated per 25.4.4.3

**Embedment depths rounded up to nearest whole inch.

*Modification factors ψ_e, ψ_p, ψ_o set to 1.0. ψ_c calculated per 25.4.4.3

**Embedment depths rounded up to nearest whole inch.

Faster Rebar Placement & Reduced Rebar Congestion

WHY NVENT LENTON TAPER-THREADED TERMINATOR?

Code changes have significantly increased the amount of rebar required, while at the same time, designers are striving for more compact structural elements. This results in rebar congestion and placement problems. Time-tested and field-proven, the nVent LENTON Taper-Threaded Terminator answers these challenges by eliminating the majority of rebar embedment lengths required, while reducing job site related labor hours.

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

nVent LENTON Taper-Threaded Terminators are designed for use in concrete with ASTM A615/A706 grades 60, 80 and 100, ENV10080, BS4449, AS3102, and other international grades of rebar in sizes #4 (12 mm) through #18 (57 mm). The Terminator requires no special training, minimizes detailing and is ideal for all types of concrete construction projects. The system is supplied through a network of local rebar fabricators utilizing standard nVent LENTON equipment.

nVent LENTON Taper-Threaded Terminator is designed to meet the requirements of ACI® 318 as an alternate to hooked rebar anchorage. ACI 318 Section 25.4.5.1 states: "Any mechanical attachment or device capable of developing f_y of reinforcement is allowed, provided that test results showing the adequacy of such attachment or device are approved by the building official."

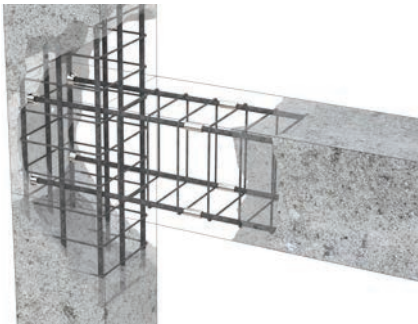


Applications

Terminators in Action



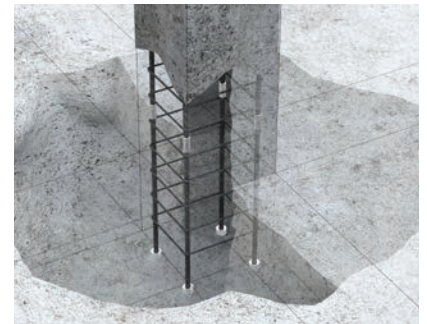
Beam/Column



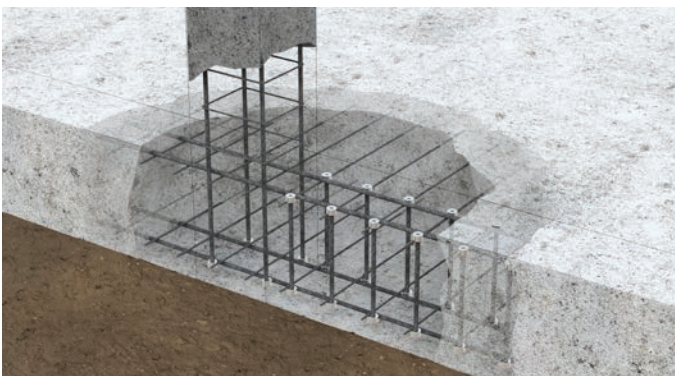
Roof/Column



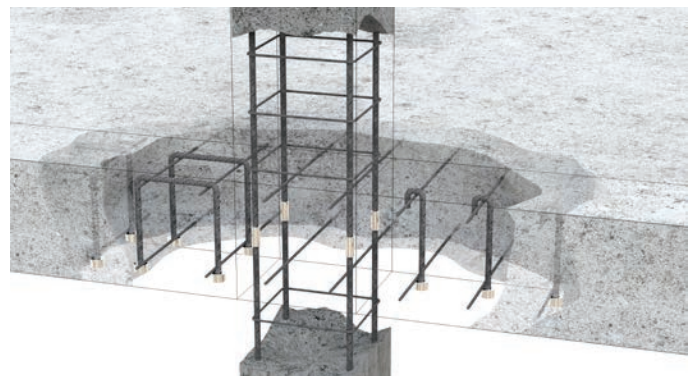
Piles/Caissons



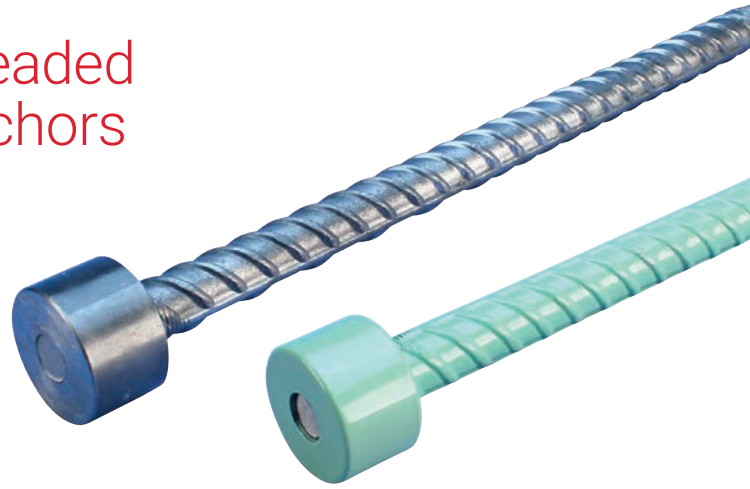
Base Slabs/Shear Reinforcement



Intermediate Floor Slabs



Why nVent LENTON Taper-Threaded Terminator and Mechanical Anchors



UNIQUE TAPER-THREADED DESIGN

The nVent LENTON Taper-Threaded Terminator system utilizes the time-tested and field-proven nVent LENTON Taper Thread. Developed in 1974, this system has been installed worldwide with global capacity to support any sized project. With no lock nuts required, Terminators provide positive locking with a no-slip connection and prevent cross-threading.

PRODUCT PERFORMANCE

- Available in two size ranges: The D14 head area exceeds 10x bar area (net 9x) and the D6/D16 head area exceeds 5x bar area (net 4x)
- Permanently secured, will not loosen or fall off during transportation or installation
- System is robust allowing for the inherent variability of rebar while maintaining the highest level of performance
- Terminators are designed to meet ASTM A970 Classes A and HA performance with A706 and A615 grade 60 and grade 80 rebar
- Caltrans Ultimate performance with A706 grade 60 rebar and ASTM A970 Class B performance with A706 and A615 grade 60 and grade 80 rebar can be achieved when combined with the addition of LENTON Plus bar preparation
- IAPMO UES Evaluation Report: IAPMO® -UES ER-0188

INSTALLATION AND DESIGN BENEFITS

- Fast to install and takes only 4.5 turns
- No special tools required
- Taper-Thread allows the maximum bar cross section to be used
- No power required for installation
- Connection inspection is quick and easy
- Durability coatings available to increase longevity

Note: nVent LENTON Snug-Tight Installation can be used with ASTM A615 or A706 Grade 60 and Grade 80 rebar for commercial projects when splice performance requirements are limited to only ACI 318 Type 1 (125% Specified Yield) or Type 2 (Specified Tensile), or when otherwise approved by the project. Additional steps may be necessary to secure product for transportation and handling. Designed for use in the North American region.

QUALITY AND STRENGTH

nVent LENTON Taper-Threaded Terminators are manufactured from high-strength, high-quality steel. All manufacturing facilities are ISO 9001-2015 registered.

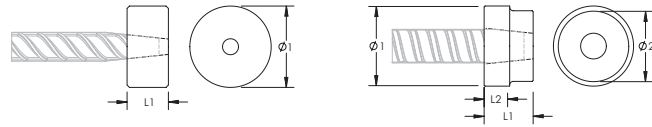
EQUIPMENT BENEFITS

- Bar threaders are easy-to-use and can be set up on-site or at the fabricator
- Allows for prefabrication, saving time on the job site
- Threaders are designed to maximize operator safety, product performance and shop efficiency
- Operator training can be conducted in-person or online; training videos are available upon request



Scan the QR code to see more information about the nVent LENTON Headed Bar and Mechanical Design Aid Brochure.

Terminator – D6 & D16

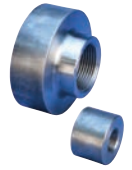
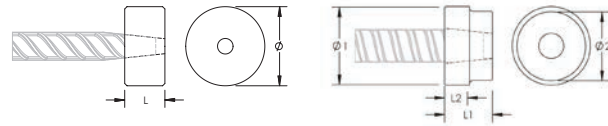


TERMINATOR – D6

Part No.	Rebar Size Designation			Diameter 1 (Ø1)		Diameter 2 (Ø2)		Length 1 (L1)		Length 2 (L2)		Weight	
	U.S.	Metric	Canadian	in	mm	in	mm	in	mm	in	mm	lb	kg
EL12D6	#4	12 mm	10M	1.38	35	–	–	0.56	14	–	–	0.2	0.1
EL16D6	#5	16 mm	15M	1.50	38	–	–	0.88	22	–	–	0.5	0.19
EL20D6	#6	20 mm	20M	1.88	48	–	–	1.13	29	–	–	0.9	0.31
EL22D6	#7	22 mm	–	2.00	51	–	–	1.25	32	–	–	0.9	0.42
EL25D6	#8	25 mm	25M	2.25	57	–	–	1.38	35	–	–	1.49	0.67
EL28D6	#9	28 mm	30M	2.75	70	–	–	1.50	38	–	–	1.87	0.85
EL32D6	#10	32 mm	–	3.00	76	–	–	1.56	40	–	–	2.6	1.18
EL36D6	#11	36 mm	35M	3.25	83	–	–	1.69	43	–	–	3.1	1.41
EL38D6	#12	38 mm	–	3.50	89	3.15	80	1.75	45	0.75	19	1.50	1.45
EL40D6	–	40 mm	–	3.75	95	3.15	80	2.17	55	1.17	30	3.99	1.81
EL43TD6	#14	43 mm	45M	4.00	102	3.15	80	2.13	54	1.13	29	5.1	2.31
EL57TD6	#18	57 mm	55M	5.13	130	3.15	80	2.75	70	1.75	44	10.1	4.59

NOTE: Thread does not need to be flush with end of Terminator. Thread may be +/-2 threads from backside of coupler. Diameter exceeds 5x bar area requirements of ICC®-ES AC 347 & ACI®.

Meets BS8110, UBC®, DIN1045, IBC, AS3600, ASTM® A970 and ACI318



TERMINATOR – D16

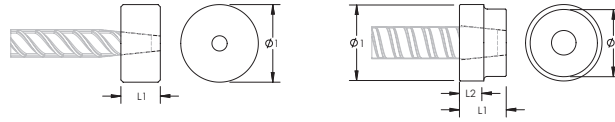
Part No.	Rebar Size Designation			Diameter 1 (Ø1)		Diameter 2 (Ø2)		Length 1 (L1)		Length 2 (L2)		Weight	
	U.S.	Metric	Canadian	in	mm	in	mm	in	mm	in	mm	lb	kg
EL12D16	#4	12 mm	10M	1.38	35	–	–	0.73	19	–	–	0.3	0.13
EL16D16	#5	16 mm	15M	1.50	38	–	–	0.94	24	–	–	0.4	0.19
EL20D16	#6	20 mm	20M	1.88	48	–	–	1.38	35	–	–	0.9	0.43
EL22D16	#7	22 mm	–	2.00	51	–	–	1.48	38	–	–	1.1	0.50
EL25D16	#8	25 mm	25M	2.25	57	–	–	1.57	40	–	–	1.5	0.69
EL28D16	#9	28 mm	30M	2.75	70	–	–	1.65	42	–	–	4.2	1.10
EL32D16	#10	32 mm	–	3.00	76	–	–	1.79	46	–	–	4.5	1.40
EL36D16	#11	36 mm	35M	3.25	83	–	–	2.05	52	–	–	4.1	1.85
EL43TD16	#14	43 mm	45M	4.00	102	3.15	80	2.64	67	1.64	42	6.73	3.05
EL57TD16	#18	57 mm	55M	5.13	130	3.15	80	3.31	84	2.31	59	12.74	5.78

NOTE: Thread does not need to be flush with end of Terminator. Thread may be +/-2 threads from backside of coupler. Diameter exceeds 5x bar area requirements of ICC-ES AC347 & ACI.

Terminator – D14 & A2D6



Meets international standards, including BS8110, DIN1045, NFA-35-020, ACI®318, and ASTM® A970.



TERMINATOR – D14

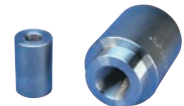
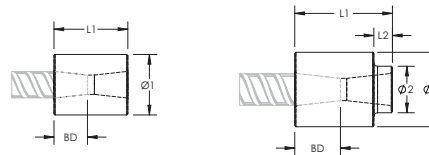
Part No.	Rebar Size Designation			Diameter 1 (Ø1)		Diameter 2 (Ø2)		Length 1 (L1)		Length 2 (L2)		Weight	
	U.S.	Metric	Canadian	in	mm	in	mm	in	mm	in	mm	lb	kg
EL12D14	#4	12 mm	10M	1.75	45	–	–	0.72	18	–	–	0.5	0.21
EL16D14	#5	16 mm	15M	2.00	51	–	–	0.94	24	–	–	0.8	0.35
EL20D14	#6	20 mm	20M	2.50	64	–	–	1.37	35	–	–	1.8	0.80
EL22D14	#7	22 mm	–	2.75	70	–	–	1.46	37	–	–	2.3	1.03
EL25D14	#8	25 mm	25M	3.25	83	–	–	1.57	40	–	–	3.4	1.56
EL28D14	#9	28 mm	30M	4.00	102	3.15	80	1.65	42	0.65	17	4.2	1.89
EL32D14	#10	32 mm	–	4.00	102	3.15	80	1.78	45	0.78	20	4.5	2.03
EL36D14	#11	36 mm	35M	5.13	130	3.15	80	2.04	52	1.04	25	7.58	3.44
EL43TD14	#14	43 mm	45M	5.50	140	3.15	61	2.64	67	1.64	34	12	5.42
EL57TD14	#18	57 mm	55M	7.25	184	3.15	80	3.31	84	2.31	41	26.3	11.93

*Available in select regions of U.S.



Meets BS8110, UBC®, IBC®, AS3600 and ACI318

- Provides both development and mechanical splice capabilities



TERMINATOR FOR FUTURE EXTENSION – A2D6

Part No.	Rebar Size Designation			Diameter 1 (Ø1)		Diameter 2 (Ø2)		Length 1 (L1)		Length 2 (L2)		Bar Depth (BD)		Weight	
	U.S.	Metric	Canadian	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
EL12A2D6	#4	12 mm	10M	1.38	35	–	–	1.63	41	–	–	0.58	15	0.60	0.28
EL16A2D6	#5	16 mm	15M	1.50	38	–	–	2.19	56	–	–	0.86	22	0.90	0.43
EL20A2D6	#6	20 mm	20M	1.88	48	–	–	2.81	71	–	–	1.09	28	1.90	0.87
EL22A2D6	#7	22 mm	–	2.00	51	–	–	3.16	80	–	–	1.26	32	2.40	1.10
EL25A2D6	#8	25 mm	25M	2.25	57	–	–	3.34	85	–	–	1.36	35	3.20	1.46
EL28A2D6	#9	28 mm	30M	2.75	70	–	–	3.59	91	–	–	1.49	38	5.30	2.39
EL32A2D6	#10	32 mm	–	3.00	76	–	–	3.78	96	–	–	1.58	40	6.50	2.94
EL36A2D6	#11	36 mm	35M	3.25	83	–	–	3.97	101	–	–	1.68	43	7.90	3.60
EL43TA2D6	#14	43 mm	45M	4.00	102	2.5	64	5.25	133	1	25	2.20	56	13.93	6.32
EL57TA2D6	#18	57 mm	55M	5.13	130	3	76	6.47	164	1	25	2.78	72	28.44	12.93

For availability: Contact your local nVent representative.

*Bar dimensions and weights listed may vary by region. Coupler sizes not shown on these pages are available by special order. Contact your nVent representative for more information on special sizes. Article numbers used in Europe, Middle East, Africa and Asia exclusively.

A Look at nVent LENTON Concrete Reinforcement Products



nVent LENTON is a world leader in advanced mechanical rebar splicing systems. Our Rebar Splicing Specialists understand the reinforced concrete business and inherent rebar splicing challenges on today's job sites. nVent LENTON offers a wide range of Mechanical Splices for a wide variety of construction needs:

- nVent LENTON Taper-Threaded Splicing Systems – Ideal alternative to conventional lap splices
- Mechanical Anchors including nVent LENTON Terminator – Ideal alternative to hooked rebar anchorage and shear reinforcement
- nVent LENTON Ultimate Splicing Systems and Terminators – Ideal for high-strain, fatigue, seismic and nuclear performance requirements
- nVent LENTON Interlok Grout-Filled Precast Splicing System – Ideal for precast structures
- nVent LENTON Quick Wedge Lap Splicing System – Ideal for retrofit applications
- nVent LENTON Speed Sleeve Compression-Only Splices – Designed Only for compression applications in columns and walls
- nVent LENTON Cadweld - Ideal for curved rebar in nuclear containment structures
- nVent LENTON Connect Shear Bolt Splicing System – Ideal in situ construction
- nVent LENTON Swaged Terminator – Ideal alternative for high-volume headed bar terminators

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

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

WARNING

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



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TERMINATOR

How to Order:

To order the correct nVent LENTON Taper-Threaded Terminator for your construction applications, please contact your local nVent Customer Care Representative.

How to Specify:

Specific: Rebar terminations shall be nVent LENTON Taper-Threaded Terminator as manufactured by nVent.

Generic: The rebar terminations shall meet building code requirements, as required, by local norms/codes. The rebar terminations should be taper-threaded style of headed bar produced from high-quality steel. Terminators should be installed to the manufacturer's requirements. The Terminators shall be manufactured using registered quality systems around the world.



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