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nVent LENTON TERMINATOR, LENTON ULTIMATE HEADED REINFORCING BAR, LENTON SWAGED TERMINATOR, AND MECHANICAL ANCHORAGE SYSTEMS IN CONCRETE

CSI Section:
03 21 00 Reinforced Steel

1.0 RECOGNITION

nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems recognized in this report have been evaluated for use as a mechanical anchorage to develop steel reinforcing bars (rebar). The structural properties of the LENTON Terminator, LENTON Swaged Terminator, LENTON Ultimate headed bar, and mechanical anchorage systems were evaluated for compliance with the following codes and regulations:

- 2021, 2018, 2015, 2012, 2009, and 2006 International Building Code® (IBC)
- 2021, 2018, 2015, 2012, 2009, and 2006 International Residential Code® (IRC)
- Building Code Requirements for Structural Concrete (ACI® 318-19, 14, -11, -08 and -05)
- 2023, 2020, and 2017 City of Los Angeles Building Code (LABC) – attached Supplement
- 2023, 2020, and 2017 City of Los Angeles Residential Code (LARC) – attached Supplement

2.0 LIMITATIONS

Use of the nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems recognized in this report is subject to the following limitations:

2.1 Headed bar systems shall be installed in accordance with the IBC®, manufacturer's installation instructions, and this report. Where conflicts occur, the more restrictive shall govern.

2.2 Anchorage system calculations and installation details shall be submitted to the building official for approval and shall be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 Where required, special inspections shall be provided in accordance with Chapter 17 of the IBC®. The duties of the special inspector shall include verification of the grade and size of the reinforcement bar, head identification, and installation of the headed bar system.

2.4 To satisfy the minimum concrete cover requirements specified in Section 20.5.1 of ACI® 318-19, Section 20.6.1 of ACI® 318-14, or Section 7.7 of ACI® 318-11, -08, or -05, the head is considered part of the bar.

2.5 For use in lightweight concrete, the nVent LENTON Terminator, LENTON Ultimate, and LENTON Swaged Terminator headed bars' systems shall be designed by a registered design professional and approved by the building official in accordance with Section 25.4.5.1 of ACI 318-19 or -14, and Section 12.6.4 of ACI 318-11 or -08.

2.6 nVent LENTON headed bar heads recognized in this report are produced in Solon, OH.

3.0 PRODUCT USE

3.1 General: nVent LENTON Terminator (D6, D16, & D14) LENTON Ultimate (DR16, DR14, TDR16 & TDR14) and LENTON Swaged Terminator (DT14 & DT16) are mechanical devices for use as headed bars and mechanical anchorage to develop steel reinforcing bars in tension in normalweight concrete as an alternative to standard hooks or to reduce development lengths of straight deformed reinforcing bars in reinforced concrete.

nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems comply with the requirements of the 2019, 2014, 2011, 2008, and 2005 editions of ACI 318; the 2021, 2018, 2015, 2012, 2009, and 2006 IBC; and the 2021, 2018, 2015, 2012, 2009, and 2006 IRC. The nVent LENTON Terminator, LENTON Ultimate headed bar, and LENTON Swaged Terminator, and mechanical anchorage systems are suitable for use on grades of reinforcing bars complying with ASTM® A615 and ASTM A706 as listed in Tables 1, 5, and 10 of this report, respectively. Additionally, both systems comply with Sections 20.2.1.6, 25.4.4, and 25.4.5 of ACI 318-19 and -14; Section 12.6 of ACI 318-08 and -11, including Annex A1 as Class HA heads of ASTM A970.

3.2 Design:

3.2.1 Limitations on Obstructions: Limitations on obstructions and interruptions in deformation patterns in front of the bearing surface of the head shall comply with ASTM A970-18 as noted in Section 20.2.1.6 of ACI 318-19, ASTM A970-13a as noted in Section 20.2.1.6 of ACI 318-14, ASTM A970-09 as noted in Section 3.5.9 of ACI 318-11, or Figure R3.5.9 as noted in ACI 318-08.

3.2.2 Development Length: The headed bar systems may be used to develop deformed bars in tension, subject to the conditions in Section 25.4.4.1 of ACI 318-19 and -14, or Section 12.6.1 of ACI 318-11 and -08. When any of these design conditions have not been met, anchorage shall be designed in accordance with Chapter 17 of ACI 318-19 or -14 or Appendix D of ACI 318-08 or -11, or designed otherwise to the satisfaction of the registered design professional and approved by the building official.

Use of the headed bar systems to develop bars in compression is not permitted, as set forth in Section 25.4.1.2 of ACI 318-19 and -14, and Section 12.6.3 of ACI 318-11 and -08.

When utilizing the equation in Section 25.4.4.2 of ACI 318-19 or -14 or Section 12.6.2 of ACI 318-11 or -08 to calculate development length (Figure R25.4.4.2a of ACI 318-19 or -14 or Figure R12.6(a) of ACI 318-08 or -11), the registered design professional shall verify that the proposed heads listed in Tables 1, 5, and 10 of this report as ASTM A970 compliant. For the 2021 IBC and IRC, the development length shall be determined in accordance with Section 25.4.4 of ACI 318-19. For the 2018, 2015, 2012, and 2009 IBC and IRC, the maximum compressive design strength of the concrete does not exceed 6,000 psi (41.37 MPa) and those conditions referenced in Section 25.4.4.1 of ACI 318-14 or Section 12.6.1 of ACI 318-11 or -08 are observed.

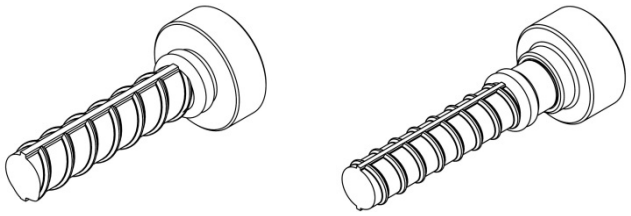
Development lengths specified for the development and splices of reinforcement do not require a strength reduction factor in accordance with Section 25.4.1.3 of ACI 318-19 or -14 or Section 9.3.3 of ACI 318-11 or -08.

3.2.3 Termination of Headed Bars: When designed in accordance with Sections 25.4.4.1 and 25.4.4.2 of ACI 318-19 or -14 or Sections 12.6.1 and 12.6.2 of ACI 318-08 or -11, longitudinal-headed deformed bars extending from a beam or a slab terminating at a support member, such as a column should extend through the joint to the far face of the confined supporting member in accordance with Figure R25.4.4.2b of ACI 318-19 or -14 Commentary or Figure R12.6(b) of ACI 318-08 or -11.

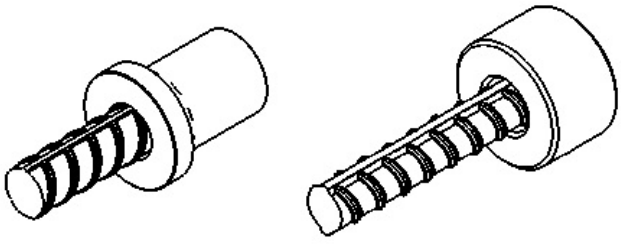
Splices of reinforcement to headed deformed reinforcing bars in tension shall comply with Sections 25.5.1 and 25.5.2 of ACI 318-19 or -14 or Sections 12.14 and 12.15 of ACI 318-11, as applicable.

3.3 Installation General: nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems shall be installed in accordance with ERICO's installation instructions, the IBC, applicable code sections of ACI 318, and this evaluation report. Where conflicts occur, the more restrictive shall govern.

nVent LENTON Terminator heads are attached to the reinforcing bar utilizing internal taper threads within the head mating with taper-threaded bar ends prepared by a fabricator approved by ERICO.



nVent LENTON Ultimate heads and components are attached to the reinforcing bar by a friction forging process. For certain bar sizes, a male taper threaded component (MT12) may be attached to the reinforcing bar and then an nVent LENTON Terminator head is subsequently attached (illustration shown in Section 3.3 of this report). The MT12 component is compatible with and can be used with all nVent LENTON Terminator heads.



nVent LENTON Swaged Terminator heads are attached to the reinforcing bar by a cold swaging process. The reinforcing bar is inserted through the central hole of the head and cold-swaged by a fabricator approved by ERICO.

4.0 PRODUCT DESCRIPTION

4.1 nVent LENTON Terminator is a headed reinforcing bar system used to mechanically anchor No. 4, $^{1}/_{2}$-inch diameter

(12 mm) through No. 18, $2^1/_4$-inch diameter (57 mm) reinforcing steel bars. The nVent LENTON taper threaded system utilizes a 6-degree tapered thread with a varying thread pitch of 1.25 mm, 2.0 mm, or 3.5 mm, depending on the reinforcement size. Product dimensions in Figure 1 illustration of this report are listed in Tables 2, 3, and 4 for the nVent LENTON Terminator D6, D16, and D14, respectively. The net bearing area of the D6 and D16 heads exceeds four times the nominal cross-sectional area of the reinforcing bar. The net bearing area of the D14 head exceeds nine times the nominal cross-sectional area of the reinforcing bar.

4.2 nVent LENTON Ultimate DR16, DR14, TDR16, and TDR14 Series are headed reinforcing bar systems used to mechanically anchor reinforcing steel bars. The DR16 and DR14 Series mechanically anchor No. 4, $^1/_2$ inch-diameter (12 mm) through No. 18, $2^1/_4$ inch-diameter (57 mm) reinforcing steel bars. The TDR16 Series mechanically anchor No. 14, $1^3/_4$ inch-diameter (43 mm) through No. 18, $2^1/_4$ inch diameter (57 mm) reinforcing steel bars. The TDR14 Series mechanically anchor No. 9, $1^1/_8$ inch-diameter (28 mm) through No. 18, $2^1/_4$ inch-diameter (57 mm) reinforcing steel bars. Product dimensions in Figure 2 and Figure 3 illustration of this report are listed in Tables 6, 7, 8, and 9 for the nVent LENTON Ultimate DR16, DR14, TDR16, and TDR14, respectively. The net bearing area of the DR16 and TDR16 head exceeds four times the nominal cross-sectional area of the reinforcing bar. The net bearing area of the DR14 and TDR14 head exceeds nine times the nominal cross-sectional area of the reinforcing bar.

4.3 nVent LENTON Swaged Terminator DT16 Series is a headed reinforcing bar system used to mechanically anchor No. 4, $^1/_2$ inch-diameter (12 mm) through No. 18, $2^1/_4$ inch-diameter (57 mm) reinforcing steel bars. nVent LENTON Swaged Terminator DT14 Series is a headed reinforcing bar system used to mechanically anchor No. 4, $^1/_2$ inch-diameter (12 mm) through No. 11, $1^3/_8$ inch-diameter (36 mm) reinforcing steel bars. Product dimensions in Figure 4 illustration of this report are listed in Tables 11 and 12 for the nVent LENTON Swaged Terminator DT16 and DT14, respectively. The net bearing area of the DT16 head exceeds four times the nominal cross-sectional area of the reinforcing bar. The net bearing area of the DT14 head exceeds nine times the nominal cross-sectional area of the reinforcing bar.

4.4 Material information

4.4.1 Anchor Heads: nVent LENTON Terminator, nVent LENTON Ultimate headed bar, and nVent LENTON Swaged Terminator and components are manufactured from steels listed in Tables 1, 5, and 10 of this report, respectively.

4.4.2 Steel Reinforcing Bars: Reinforcing steel bars shall comply with the grades of ASTM A706 and ASTM A615 as listed in Tables 1, 5, and 10 of this report. Coatings complying with AASHTO® M 284, ASTM A775, ASTM A934, and ASTM A767 shall be applied prior to threading or in a manner as not to interfere with proper thread engagement.

5.0 IDENTIFICATION

All nVent LENTON Terminator, LENTON Ultimate headed bar, and LENTON Swaged Terminator are packaged with a label bearing the manufacturer's mark or logo, the unique heat code identification, and the letter "H" to indicate that the heads have been produced to the ASTM A970 Annex A1 specification. Packaging labels for the headed deformed bars shall include the manufacturer or a registered trademark, the model or name of the product, and the Evaluation Report Number (ER-0188) to identify the products recognized in this report. A die-stamp label may also substitute for the label. Either IAPMO UES Mark of Conformity also may be used as shown below:

or

IAPMO UES ER-0188

6.0 SUBSTANTIATING DATA

6.1 Data was submitted in accordance with IAPMO®-UES Evaluation Criteria for Headed and Mechanically Anchored Deformed Reinforcement Bars in Tension (EC 006-2021), approved August 2021.

6.2 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on nVent LENTON Terminator, LENTON Ultimate headed reinforcing bar, LENTON Swaged Terminator, and mechanical anchorage systems to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.6 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

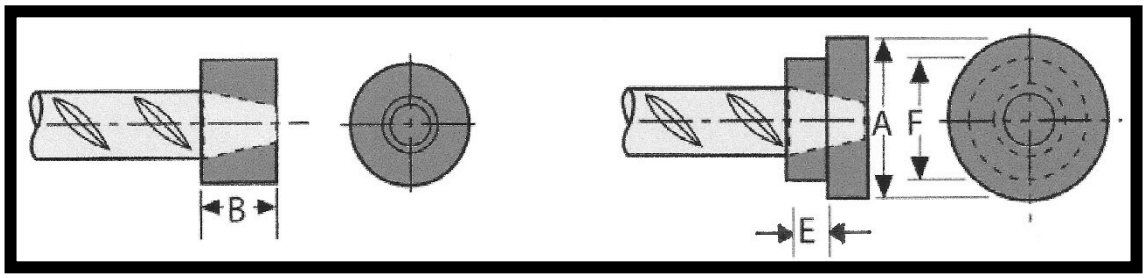
For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1: nVent LENTON TERMINATOR D6, D16, & D14 SPECIFICATIONS

Series and Part Number Suffix	Material Grade	ASTM® A970 Compliant	Rebar Material	Rebar Sizes
nVent LENTON Terminator D6	AISI 1141 (or equivalent)	ASTM A970-18, -13a, -12, -09	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
		ASTM A970-07[1]	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
nVent LENTON Terminator D16	AISI 1141 (or equivalent)	ASTM A970-18, -13a, -12, -09	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
		ASTM A970-07[1]	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
		ASTM A970-06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60	#4 to #18[1]
			ASTM A615 Gr. 75 & 80	#5 & #10
nVent LENTON Terminator D14	AISI 1141 (or equivalent)	ASTM A970-18, -13a, -12, -09	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
		ASTM A970-07[1]	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to # 18[1]
		ASTM A970-06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60	#4 to #18[1]
			ASTM A615 Gr. 75 & 80	#5 & #10

[1] Note: Anchorage shall be designed in accordance with ACI 318-19 or -14 Chapter 17, ACI 318-11 or -08 Appendix D or designed otherwise to the satisfaction of the registered design professional and approved by the building official for heads compliant with ASTM A970-07, Grade 75 reinforcement bar, Grade 80 reinforcement bar, or for reinforcement bar sizes that exceed No.11.

FIGURE 1: nVent LENTON Terminator – D6/D16/D14 Series



A = Large Diameter
B = Length of nVent LENTON Terminator Head & Bar Engagement
E = Length of Small Step (when applicable)
F = Small Diameter (when applicable

TABLE 2: nVent LENTON Terminator – D6 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
4	12	10M	13	EL12D6	1-3/8	35	9/16	14	–	–	–	–
5	16	15M	16	EL16D6	1-1/2	38	7/8	22	–	–	–	–
6	20	20M	19	EL20D6	1-7/8	48	1-1/8	29	–	–	–	–
7	22	–	22	EL22D6	2	51	1-1/4	32	–	–	–	–
8	25	25M	25	EL25D6	2-1/4	57	1-3/8	35	–	–	–	–
9	28	30M	29	EL28D6	2-3/4	70	1-1/2	38	–	–	–	–
10	32	–	32	EL32D6	3	76	1-9/16	40	–	–	–	–
11	36	35M	36	EL36D6	3-1/4	83	1-11/16	43	–	–	–	–
–	40	–	–	EL40D6	3-3/4	95	2-1/2	64	1	25	2-5/16	76
14	43	45M	43	EL43TD6	4	102	2-1/8	54	1	25	2-1/2	76
–	50	–	–	EL50TD6	4-1/2	114	2-9/16	65	1	25	2-15/16	76
18	57	55M	57	EL57TD6	5-1/8	130	2-3/4	70	1	25	3	76

NOTE 1: Thread does not need to be flush with the end of nVent LENTON Terminator. The thread may be +/- 2 threads from the backside of the head.
NOTE 2: Net bearing area (A_{brg}) exceeds 4 times the area of the bar (A_{br}).

TABLE 3: nVent LENTON Terminator – D16 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
4	12	10M	13	EL12D16	1-3/8	35	3/4	19	–	–	–	–
5	16	15M	16	EL16D16	1-1/2	38	15/16	24	–	–	–	–
6	20	20M	19	EL20D16	1-7/8	48	1-3/8	35	–	–	–	–
7	22	–	22	EL22D16	2	51	1-7/16	38	–	–	–	–
8	25	25M	25	EL25D16	2-1/4	57	1-9/16	40	–	–	–	–
9	28	30M	29	EL28D16	2-3/4	70	1-5/8	42	–	–	–	–
10	32	–	32	EL32D16	3	76	1-3/4	46	–	–	–	–
11	36	35M	36	EL36D16	3-1/4	83	2-1/16	52	–	–	–	–
–	40	–	–	EL40D16	3-3/4	95	2-1/4	58	1	25	2-5/16	59
14	43	45M	43	EL43TD16	4	102	2-5/8	67	1	25	2-1/2	64
–	50	–	–	EL50TD16	4-1/2	114	2-13/16	71	1	25	2-15/16	75
18	57	55M	57	EL57TD16	5-1/8	130	3-5/16	84	1	25	3-1/8	80

NOTE 1: Thread does not need to be flush with the end of nVent LENTON Terminator. The thread may be +/- 2 threads from the backside of the head.
NOTE 2: Net bearing area (A_{brg}) exceeds 4 times the area of the bar (A_{br}).

TABLE 4: nVent LENTON Terminator – D14 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
4	12	10M	13	EL12D14	1-3/4	45	11/16	18	–	–	–	–
–	14	–	–	EL14D14	1-3/4	45	13/16	21	–	–	–	–
5	16	15M	16	EL16D14	2	55	15/16	24	–	–	–	–
–	18	–	–	EL18D14	2-1/2	60	1-1/8	29	–	–	–	–
6	20	20M	19	EL20D14	2-1/2	65	1-3/8	35	–	–	–	–
7	22	–	22	EL22D14	2-3/4	70	1-7/16	38	–	–	–	–
8	25	25M	25	EL25D14	3-1/4	80	1-9/16	40	–	–	–	–
9	28	30M	29	EL28D14	3-3/4	95	1-5/8	42	1	25	1-11/16	43
–	30	–	–	EL30D14	3-3/4	95	2-1/16	52	1	25	1-3/4	44
10	32	–	32	EL32D14	4	105	1-3/4	46	1	25	1-7/8	48
–	34	–	–	EL34D14	4-3/8	110	2-3/16	55	1	25	2	51
11	36	35M	36	EL36D14	4-1/2	115	2-1/16	52	1	25	2-1/16	52
–	38	–	–	EL38D14	4-3/4	120	2-1/8	53	1	25	2-3/16	56
–	40	–	–	EL40D14	5	130	2-1/4	58	1	25	2-5/16	59
14	43	45M	43	EL43TD14	5-1/2	150	2-5/8	67	1-5/16	34	2-1/2	61
–	50	–	–	EL50TD14	6-1/2	160	2-13/16	71	1-5/16	33	3-1/8	77
18	57	55M	57	EL57TD14	7-1/4	190	3-5/16	84	1-5/8	41	3-1/8	80

NOTE 1: Thread does not need to be flush with the end of nVent LENTON Terminator. The thread may be +/- 2 threads from the backside of the head.
NOTE 2: Net bearing area (A_{brg}) exceeds 9 times the area of the bar (A_{br}).

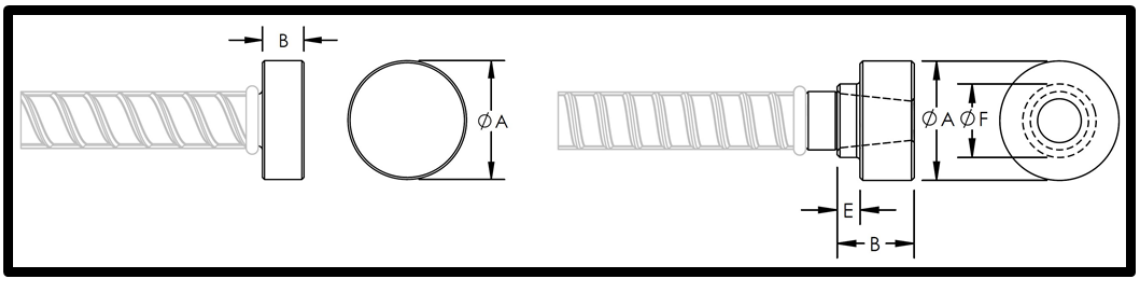
TABLE 5: nVent LENTON Ultimate DR16, DR14, TDR16, & TDR14 SPECIFICATIONS

Series and Part Number Suffix	Material Grade	ASTM® A970 Compliant	Rebar Material	Rebar Sizes
nVent LENTON Ultimate DR16	AISI 1045[2] (or equivalent)	ASTM A970 -18,-13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
nVent LENTON Ultimate DR14	AISI 1045[2] (or equivalent)	ASTM A970 -18,-13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
nVent LENTON Ultimate TDR16	AISI 1045/1141/4140 (or equivalent)	ASTM A970 -18,-13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#14[1] & #18[1]
nVent LENTON Ultimate TDR14	AISI 1045/1141/4140 (or equivalent)	ASTM A970 -18,-13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#9 to #11[1]; #14[1] & 18[1]

[1] Note: Anchorage shall be designed in accordance with ACI 318-19 or -14 Chapter 17, ACI 318-11 or -08 Appendix D or designed otherwise to the satisfaction of the registered design professional and approved by the building official for heads compliant with ASTM A970-07, Grade 75 reinforcement bar, Grade 80 reinforcement bar, or for reinforcement bar sizes that exceed No.11.

[2] Note: For nVent LENTON Ultimate headed bars with MT12 male taper thread component and nVent LENTON Terminator head, the material grade for MT12 is as noted in Table 5 and nVent LENTON Terminator head is as noted in Table 1 of this report.

FIGURE 2: nVent LENTON Ultimate – DR16 & DR14 Series



A = Large Diameter
B = Length of nVent LENTON Ultimate Head or nVent LENTON Terminator Head & Bar Engagement
E = Length of Small Step (when applicable)
F = Small Diameter (when applicable)

TABLE 6: nVent LENTON Ultimate – DR16 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
4	12	10M	13	LU12DR16	1-3/8	35	19/32	15	-	-	-	-
5	16	15M	16	LU16DR16	1-3/4	45	19/32	15	-	-	-	-
6	20	20M	19	LU20DR16	2	51	19/32	15	-	-	-	-
7	22	–	22	LU22DR16	2-1/4	57	19/32	15	-	-	-	-
8	25	25M	25	LU25DR16	2-1/2	64	25/32	20	-	-	-	-
9	28	30M	29	LU28DR16	2-3/4	70	25/32	20	-	-	-	-
10	32	–	32	LU32DR16	3	76	25/32	20	-	-	-	-
11	36	35M	36	LU36DR16	3-1/4	83	31/32	25	-	-	-	-
-	40	-	-	LU40DR16	3-3/4	95	31/32	25	-	-	-	-
-	40	-	-	EL40D16 LU40MT12	3-3/4	95	2-1/4	58	1	25	2-5/16	59
14	43	45M	43	LU43DR16	4	102	1-3/16	30	-	-	-	-
14	43	45M	43	EL43TD16 LU43TMT12	4	102	2-5/8	67	1	25	2-1/2	64
-	50	-	-	LU50DR16	4-1/2	114	1-1/4	32	-	-	-	-
-	50	-	-	EL50TD16 LU50MT12	4-1/2	114	2-13/16	71	1	25	2-15/16	75
18	57	55M	57	LU57DR16	5-1/8	130	1-13/32	36	-	-	-	-
18	57	55M	57	EL57TD16 LU57TMT12	5-1/8	130	3-5/16	84	1	25	3-1/8	80

NOTE 1: Thread does not need to be flush with the end of nVent LENTON Terminator. The thread may be +/- 2 threads from the backside of the head.

NOTE 2: Net bearing area (A_{brg}) exceeds 4 times the area of the bar (A_{br}).

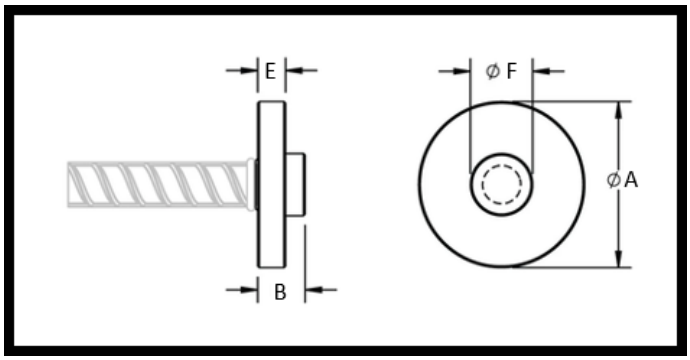
TABLE 7: nVent LENTON Ultimate – DR14 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
4	12	10M	13	LU12DR14	1-3/4	45	19/32	15	-	-	-	-
5	16	15M	16	LU16DR14	2	51	19/32	15	-	-	-	-
6	20	20M	19	LU20DR14	2-1/2	64	19/32	15	-	-	-	-
7	22	–	22	LU22DR14	2-3/4	70	19/32	15	-	-	-	-
8	25	25M	25	LU25DR14	3-1/4	83	25/32	20	-	-	-	-
9	28	30M	29	LU28DR14	3-3/4	95	25/32	20	-	-	-	-
9	28	30M	29	EL28D14 & LU28MT12	3-3/4	95	1-5/8	42	1	25	1-11/16	43
10	32	-	32	LU32DR14	4	102	25/32	20	-	-	-	-
10	32	–	32	EL32D14 & LU32MT12	4	102	1-3/4	46	1	25	1-7/8	48
11	36	35M	36	LU36DR14	4-1/2	114	31/32	25	-	-	-	-
11	36	35M	36	EL36D14 & LU36MT12	4-1/2	114	2-1/16	52	1	25	2-1/16	52
-	40	-	-	LU40DR14	5	127	31/32	25	-	-	-	-
-	40	-	-	EL40D14 & LU40MT12	5	127	2-1/4	58	1	25	2-5/16	59
14	43	45M	43	LU43DR14	5-1/2	140	1-3/16	30	-	-	-	-
14	43	45M	43	EL43TD14 & LU43TMT12	5-1/2	140	2-5/8	67	1-5/16	34	2-1/2	61
-	50	-	-	LU50DR14	6-1/2	165	1-1/4	32	-	-	-	-
-	50	-	-	EL50TD14 & LU50TMT12	6-1/2	165	2-13/16	71	1-5/16	33	3-1/8	77
18	57	55M	57	LU57DR14	7-1/4	184	1-13/32	36	-	-	-	-
18	57	55M	57	EL57TD14 & LU57TMT12	7-1/4	184	3-5/16	84	1-5/8	41	3-1/8	80

NOTE 1: Thread does not need to be flush with the end of nVent LENTON Terminator. The thread may be +/- 2 threads from the backside of the head.

NOTE 2: Net bearing area (A_{brg}) exceeds 9 times the area of the bar (A_{br}).

FIGURE 3: nVent LENTON Ultimate – TDR16 & TDR14 Series



A = Large Diameter
B = Length of nVent LENTON Ultimate Head
E = Length of Step
F = Small Diameter

TABLE 8: nVent LENTON Ultimate – TDR16 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	in	mm
14	43	45M	43	LU43TDR16	4	102	1-3/4	45	1-1/16	26	2-1/4	57
18	57	55M	57	LU57TDR16	5-1/8	130	2-13/32	61	1-7/16	37	3	76

NOTE 1: Net bearing area (A_{brg}) exceeds 4 times the area of the bar (A_{br}).

TABLE 9: nVent LENTON Ultimate – TDR14 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"E"		"F"	
No.	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm	In	mm
9	28	30M	29	LU28TDR14	4	102	1-5/32	29	11/16	17	1-1/2	38
10	32	-	32	LU32TDR14	4	102	1-5/16	34	25/32	20	1-3/4	45
11	36	35M	36	LU36TDR14	5-1/8	130	1-1/2	38	7/8	22	1-7/8	48
14	43	45M	43	LU43TDR14	5-1/2	140	1-3/4	45	1-1/16	26	2-1/4	57
18	57	55M	57	LU57TDR14	7-1/4	184	2-13/32	61	1-7/16	37	3	76

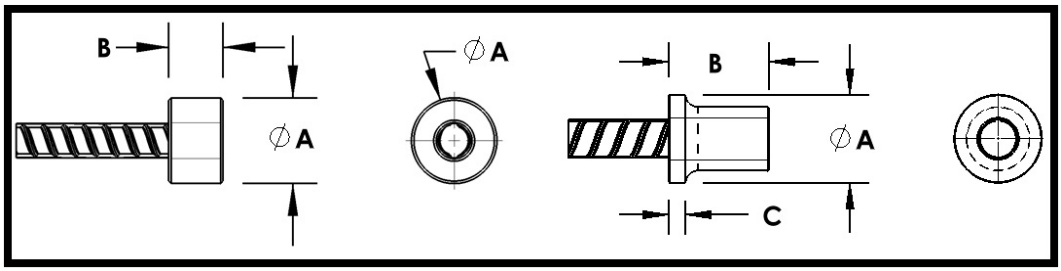
NOTE 1: Net bearing area (A_{brg}) exceeds 9 times the area of the bar (A_{br}).

TABLE 10: nVent LENTON Swaged Terminator DT16 and DT14 SPECIFICATIONS

Series and Part Number Suffix	Material Grade	ASTM® A970 Compliant	Rebar Material	Rebar Sizes
nVent LENTON Swaged Terminator DT16	AISI 1018 (or equivalent)	ASTM A970-18, -13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #18[1]
nVent LENTON Swaged Terminator DT14	AISI 1018 (or equivalent)	ASTM A970-18, -13a, -12, -09, -07[1], -06	ASTM A706 Gr. 60 & 80 ASTM A615 Gr. 60, 75, & 80	#4 to #11[1]

[1] Note: Anchorage shall be designed in accordance with ACI 318-19 or -14 Chapter 17, ACI 318-11 or -08 Appendix D, or designed otherwise to the satisfaction of the registered design professional and approved by the building official for heads compliant with ASTM A970-07, Grade 75 reinforcement bar, Grade 80 reinforcement bar, or for reinforcement bar sizes that exceed No.11.

FIGURE 4: nVent LENTON Swaged Terminator - DT16 & DT14 Series



A = Large Diameter
B = Length of nVent LENTON Swaged Terminator Head
C = Length of Step (when applicable)

TABLE 11: nVent LENTON Swaged Terminator – DT16 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"C"	
In/lb	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm
4	12	10M	13	LS12DT16	1-3/8	35	7/8	22	-	-
5	16	15M	16	LS16DT16	1-3/4	45	1-1/16	27	-	-
6	20	20M	19	LS20DT16	1-15/16	49	1-1/2	38	-	-
7	22	–	22	LS22DT16	2-3/8	61	1-1/2	38	-	-
8	25	25M	25	LS25DT16	2-3/4	70	1-3/4	45	-	-
9	28	30M	29	LS28DT16	2-7/8	73	1-15/16	49	-	-
10	32	–	32	LS32DT16	3-3/8	86	2-3/16	56	-	-
11	36	35M	36	LS36DT16	3-13/16	97	2-7/16	62	-	-
14	43	45M	43	LS43DT16	4	102	4	102	3/4	19
18	57	55M	57	LS57DT16	5-1/4	133	6	152	1	25

NOTE 1: Net bearing area (A_{brg}) exceeds 4 times the area of the bar (A_{br}).

TABLE 12: nVent LENTON Swaged Terminator – DT14 Series

Reinforcement Bar Designation				Part Number	"A"		"B"		"C"	
In/lb	Metric (mm)	Canadian	Soft Metric		in	mm	in	mm	in	mm
4	12	10M	13	LS12DT14	1-5/8	41	1-1/2	38	5/16	8
5	16	15M	16	LS14DT14	2	51	1-25/32	45	3/8	10
6	20	20M	19	LS20DT14	2-3/8	61	2-1/4	57	3/8	10
7	22	–	22	LS22DT14	2-7/8	73	2-5/16	59	13/32	10
8	25	25M	25	LS25DT14	3-1/4	83	2-19/32	66	13/32	10
9	28	30M	29	LS28DT14	3-3/4	95	2-29/32	74	15/32	12
10	32	–	32	LS32DT14	4	102	3-3/16	81	1/2	13
11	36	35M	36	LS36DT14	4-1/2	114	3-21/32	93	11/16	18

NOTE 1: Net bearing area (A_{brg}) exceeds 9 times the area of the bar (A_{br}).

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nVent LENTON TERMINATOR, LENTON ULTIMATE HEADED REINFORCING BAR, LENTON SWAGED TERMINATOR, AND MECHANICAL ANCHORAGE SYSTEMS IN CONCRETE

CSI Section:
03 21 00 Reinforced Steel

1.0 RECOGNITION

nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems described in ER-0188 and this 2023, 2020, and 2017 LABC and LARC supplemental report have been evaluated for use as a mechanical anchorage to develop steel reinforcing bars (rebar). The structural properties of the nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems have been evaluated for compliance with the requirements in ER-0188 and the following codes and regulations:

- 2023, 2020, and 2017 City of Los Angeles Building Code (LABC)
- 2023, 2020, and 2017 City of Los Angeles Residential Code (LARC)

2.0 LIMITATIONS

Use of the nVent LENTON Terminator LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems recognized in this supplement is subject to the following limitations:

2.1 The nVent Lenton Terminator, Lenton Ultimate Headed Reinforcing Bar, Lenton Swaged Terminator, and Mechanical Anchorage Systems shall comply with the provisions in IAPMO UES ER-188 applicable to the 2021 IBC or IRC for use under the 2023 LABC or LARC; 2018 IBC or IRC for use under the 2020 LABC or LARC; or 2015 IBC or IRC for use under the 2017 LABC or LARC.

2.2 Calculations and specifications verifying compliance with the nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems shall be submitted to the plan check engineer at the time of permit application. nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems' calculations shall be prepared, stamped, and signed by a California registered design professional.

2.3 Design, installation, and inspection shall be in accordance with Chapters 16 and 17 of the LABC or the LARC, as applicable, due to local amendments to these chapters.

2.4 Periodic special inspection shall be provided by the Registered Deputy Inspector in accordance with Section 1705 of the 2023, 2020, and 2017 LABC during installations of the nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems.

2.5 The fabricator of the steel for the nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems shall be required to maintain a detailed procedure for material control and suitable procedures and records attesting that the specified material has been furnished. The applicable ASTM designation or coating, as applicable, shall be included in each packaging assembly prior to shipment from the fabricator's plant. The fabricator's identification mark designation shall be established and on record prior to fabrication. Steel that is not identifiable from marking and test records shall be tested to determine conformity to this report. The fabricator shall furnish an affidavit of compliance and test data shall be provided upon request.

2.6 Minimum concrete cover shall be provided in accordance with Section 1808.8.2 of the 2023, 2020, and 2017 LABC. Concrete cover shall be measured from the outer surface of the End Anchors for the Reinforcing Bar's head.

2.7 The nVent LENTON Terminator, LENTON Ultimate headed bar, LENTON Swaged Terminator, and mechanical anchorage systems shall be installed in accordance with the applicable code, manufacturer's installation instructions, and this supplement. A copy of the manufacturer's installation instructions shall be available on-site for all Registered Deputy Inspectors.

2.8 This supplement expires concurrently with ER-0188.