Titen HD® Threaded Rod Hanger

The Titen HD threaded rod hanger is a high-strength screw anchor designed to suspend threaded rod from concrete slabs, beams or concrete over steel in order to hang pipes, cable trays and other HVAC equipment. The anchor offers low installation torque with no secondary setting, and has been tested to offer industry-leading performance in cracked and uncracked concrete — even in seismic loading conditions.

Features

- Thread design undercuts to efficiently transfer the load to the base material
- Serrated cutting teeth and patented thread design enable quick and easy installation
- Specialized heat-treating process creates tip hardness to facilitate cutting while the anchor body remains ductile
- Designed to install using a rotary hammer or hammer drill with standard ANSI drill bits — no special tools required
- Installs with standard-sized sockets
- Code listed for cracked and uncracked concrete applications under the 2015, 2012 and 2009 IBC/IRC, per ICC-ES ESR-2713
- FM listed

Codes: ICC-ES ESR-2713;
City of LA Supplement within ESR-2713;
FL15730;
Factory Mutual 3031136 (THD50234RH)
and 3061897 (THDB37158RH)

Material: Carbon steel

Coating: Zinc plated

THD50234RH
(⅜"-dia. shank)

THDB37158RH
(¼"-dia. shank)

THDB25158RH
(¼"-dia. shank)

U.S. Patent 6,623,228

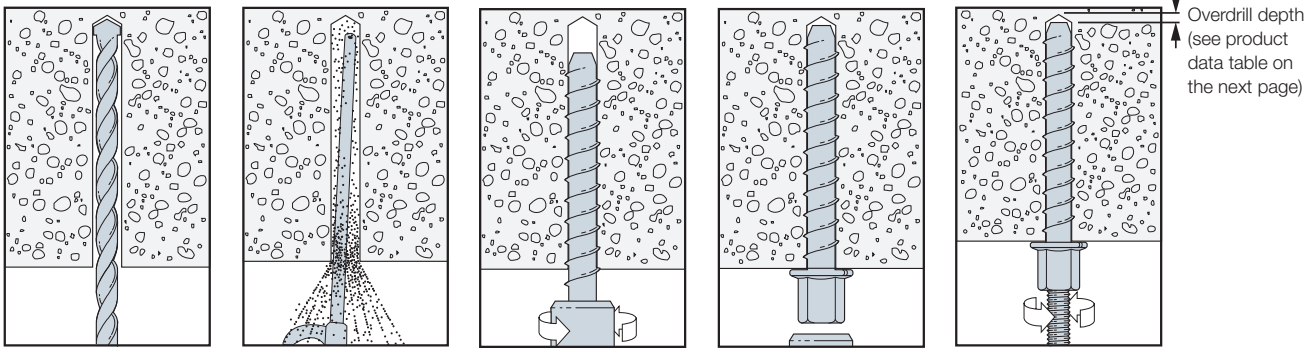
Installation

Caution: Oversized holes in the base material will reduce or eliminate the mechanical interlock of the threads with base material and will reduce the anchor's load capacity.

Caution: Use a Titen HD® rod hanger one time only. Installing the anchor multiple times may result in excessive thread wear and reduce load capacity.

1. Drill a hole using the specified diameter carbide bit into the base material to the specified embedment depth plus minimum hole depth overdrill (see the product data table on the next page).
2. Blow the hole clean of dust and debris using compressed air.
3. Install with a torque wrench, driver drill, hammer drill or cordless impact wrench.
4. Fully insert threaded rod.

Installation Sequence



Titen HD® Rod Hanger Design Information — Concrete

Titen HD Threaded Rod Hanger Product Data

Size (in.)	Model No.	Accepts Rod Dia. (in.)	Drill Bit Dia. (in.)	Wrench Size (in.)	Min. Embed. (in.)	Hole Depth Overdrill (in.)	Quantity	
							Box	Carton
Cracked Concrete	THDB25158RH	¼	¼	⅜	1⅝	⅛	100	500
FM APPROVED, Cracked Concrete	THDB37158RH	⅜	¼	½	1⅝	⅛	50	200
FM APPROVED, Cracked Concrete	THD50234RH	½	⅜	11⁄16	2½	¼	50	100

Titen HD Threaded Rod Hanger Installation Information and Additional Data[1]

Characteristic	Symbol	Units	Model No.	
			THDB25158RH THDB37158RH	THD50234RH
Installation Information				
Rod Hanger Diameter	d_o	in.	¼ or ⅜	½
Drill Bit Diameter	d_{bit}	in.	¼	⅜
Maximum Installation Torque[2]	$T_{inst,max}$	ft.-lb.	24	50
Maximum Impact Wrench Torque Rating[3]	$T_{impact,max}$	ft.-lb.	125	150
Minimum Hole Depth	h_{hole}	in.	1¾	3
Embedment Depth	h_{nom}	in.	1⅝	2¾
Effective Embedment Depth	h_{ef}	in.	1.19	1.77
Critical Edge Distance	c_{ac}	in.	3	2 11⁄16
Minimum Edge Distance	c_{min}	in.	1½	1¾
Minimum Spacing	s_{min}	in.	1½	3
Minimum Concrete Thickness	h_{min}	in.	3¼	4¼
Anchor Data				
Yield Strength	f_{ya}	psi	100,000	97,000
Tensile Strength	f_{uta}	psi	125,000	110,000
Minimum Tensile and Shear Stress Area	A_{se}	in.^{2}	0.042	0.099
Axial Stiffness in Service Load Range — Uncracked Concrete	β_{uncr}	lb./in.	202,000	672,000
Axial Stiffness in Service Load Range — Cracked Concrete	β_{cr}	lb./in.	173,000	345,000

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D.
2. $T_{inst,max}$ is the maximum permitted installation torque for installations using a torque wrench.
3. $T_{impact,max}$ is the maximum permitted torque rating for impact wrenches.

Titen HD® Rod Hanger Design Information — Concrete

Titen HD Threaded Rod Hanger Tension Strength Design Data for Installations in Concrete[1]

Characteristic	Symbol	Units	Model No.	
			THDB25158RH THDB37158RH	THD50234RH
Anchor Category	1, 2 or 3	—	1	
Embedment Depth	h_{nom}	in.	1⅝	2½
Steel Strength in Tension (ACI 318-14 Section 17.4.1 or ACI 318-11 Section D.5.1)				
Tension Resistance of Steel	N_{sa}	lb.	5,195	10,890
Strength Reduction Factor — Steel Failure[2]	ϕ_{sa}	—	0.65	
Concrete Breakout Strength in Tension (ACI 318-14 Section 17.4.2 or ACI 318-11 Section D.5.2)				
Effective Embedment Depth	h_{ef}	in.	1.19	1.77
Critical Edge Distance	c_{ac}	in.	3	2¹¹⁄₁₆
Effectiveness Factor — Uncracked Concrete	k_{uncr}	—	30	24
Effectiveness Factor — Cracked Concrete	k_{cr}	—	17	
Modification Factor	$\Psi_{c,N}$	—	1.0	
Strength Reduction Factor — Concrete Breakout Failure[3]	ϕ_{cb}	—	0.65	
Pullout Strength in Tension (ACI 318-14 Section 17.4.3 or ACI 318-11 Section D.5.3)				
Pullout Resistance — Uncracked Concrete (f'_c = 2,500 psi)	$N_{p,uncr}$	lb.	N/A[4]	2,025[5]
Pullout Resistance — Cracked Concrete (f'_c = 2,500 psi)	$N_{p,cr}$	lb.	N/A[4]	1,235[5]
Strength Reduction Factor — Pullout Failure[6]	ϕ_p	—	0.65	
Tension Strength for Seismic Applications (ACI 318-14 Section 17.2.3.3 or ACI 318-11 Section D.3.3.3)				
Nominal Pullout Strength for Seismic Loads (f'_c = 2,500 psi)	$N_{p,eq}$	lb.	N/A[4]	1,235[5]
Strength Reduction Factor — Pullout Failure[6]	ϕ_{eq}	—	0.65	

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used, as applicable. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(b), as applicable.
3. The tabulated values of ϕ_{cb} applies when both the load combinations of Section 1605.2 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2, as applicable, are used and the requirements of ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided in concrete. For installations were complying reinforcement can be verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.
4. As described in this report, N/A denotes that pullout resistance does not govern and does not need to be considered.
5. The characteristic pullout resistance for greater compressive strengths may be increased by multiplying the tabular value by $(f'_c/2{,}500)^{0.5}$.
6. The tabulated values of ϕ_p or ϕ_{eq} applies when both the load combinations of ACI 318-14 Section 5.3 or ACI 318-11 Section 9w.2, as applicable, are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided in concrete. For installations were complying reinforcement can be verified, the ϕ_p or ϕ_{eq} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ must be determined in accordance with ACI 318-11 D.4.4(c) for Condition B.

** See p. 12 for an explanation of the load table icons.*

Titen HD® Rod Hanger Design Information — Concrete

Titen HD Threaded Rod Hanger Tension Strength Design Data for Installations in the Lower and Upper Flute of Normal-Weight or Sand-Lightweight Concrete Through Steel Deck[1,2,5,6]

Characteristic	Symbol	Units	Model No.		
			Lower Flute		Upper Flute
			Figure 2	Figure 1	Figure 2
			THDB25158RH THDB37158RH	THD50234RH	THDB25158RH THDB37158RH
Minimum Hole Depth	h_{hole}	in.	1¾	3	1¾
Embedment Depth	h_{nom}	in.	1⅝	2½	1⅝
Effective Embedment Depth	h_{ef}	in.	1.19	1.77	1.19
Pullout Resistance – Cracked Concrete[2,3,4]	$N_{p,deck,cr}$	lbf.	420	870	655
Pullout Resistance – Uncracked Concrete[2,3,4]	$N_{p,deck,uncr}$	lbf.	995	1,430	1,555

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. Concrete compressive strength shall be 3,000 psi minimum. The characteristic pullout resistance for greater compressive strengths shall be increased by multiplying the tabular value by $(f'_{c,specified}/3{,}000\ psi)^{0.5}$.
3. For anchors installed in the soffit of sand-lightweight or normal-weight concrete over steel deck floor and roof assemblies, as shown in Figure 1 or Figure 2, calculation of the concrete breakout strength may be omitted.
4. In accordance with ACI 318-14 Section 17.4.3.2 or ACI 318-11 Section D.5.3.2, the nominal pullout strength in cracked concrete for anchors installed in the soffit of sand-lightweight or normal-weight-concrete-over-steel-deck floor and roof assemblies $N_{p,deck,cr}$ shall be substituted for $N_{p,cr}$. Where analysis indicates no cracking at service loads, the normal pullout strength in uncracked concrete $N_{p,deck,uncr}$ shall be substituted for $N_{p,uncr}$.
5. Minimum distance to edge of panel is $2h_{ef}$.
6. The minimum anchor spacing along the flute must be the greater of $3h_{ef}$ or 1.5 times the flute width.

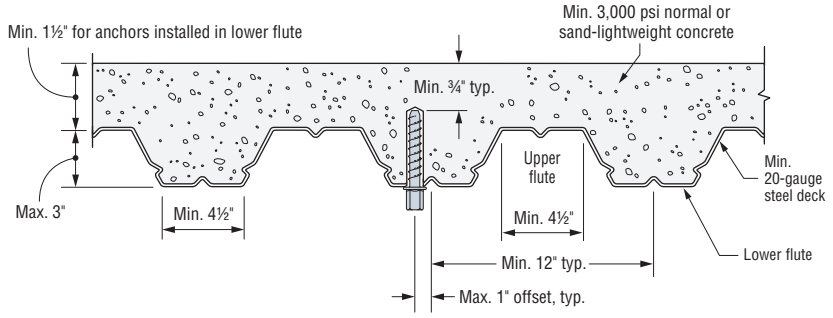


Figure 1. THD50234RH Installation in Concrete over Steel Deck

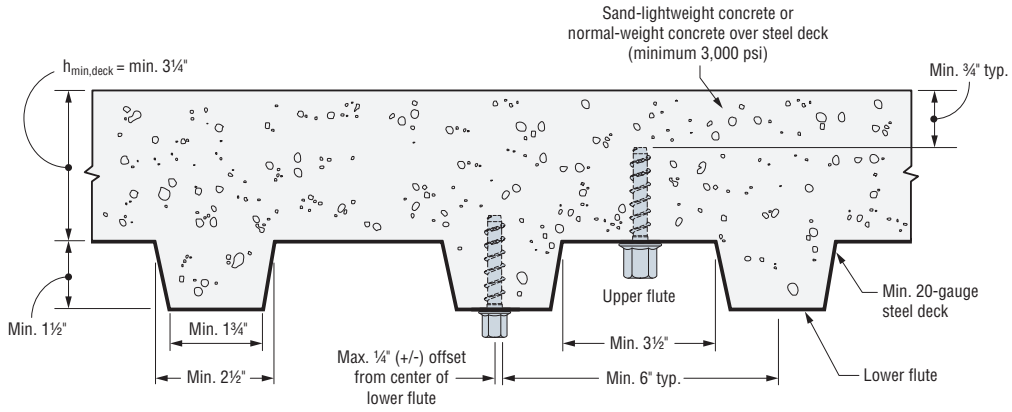


Figure 2. THDB25158RH and THDB37158RH Installation in Concrete over Steel Deck

** See p. 12 for an explanation of the load table icons.*