Titen HD® Rod Hanger

SIMPSON Strong-Tie ANCHOR SYSTEMS

New Design Features ⅜" Shank, Code-Listed for Cracked and Uncracked Concrete Applications

The Titen HD® Rod Hanger is a high-strength screw anchor that provides a fast and convenient way to suspend threaded rod from concrete slabs and beams. Simpson Strong-Tie Anchor Systems® now offers two new designs that feature a ⅜" shank and are code-listed by ICC-ES for cracked and uncracked concrete applications under the 2006 and 2009 IBC.

By providing high load capacity and ease of installation, the Titen HD Rod Hanger is purpose-built to anchor rods in order to hang pipes, cable trays and HVAC equipment. Unlike traditional drop-in anchors, installation requires no special tool or secondary setting process – just drill a hole and drive the anchor. The serrated cutting teeth and patented thread design enable the Titen HD Rod Hanger to be installed quickly and with significantly less effort when compared to other screw-type anchors.

FEATURES:

- Models for ⅜" and ½" diameter threaded rod
- High load capacity as a result of the full length threads that undercut the concrete and effectively transfer load into the base material
- Specialized heat-treating process creates high hardness at the tip to facilitate cutting while the body remains ductile
- No special installation tools required. Holes can be drilled with a rotary hammer or hammer drill with ANSI-size bit. Anchors are installed with standard-size sockets
- Less installation time translates to lower installed cost

U.S. Patent 5,674,035 & 6,623,228

MATERIAL: Carbon steel, heat treated **FINISH:** Zinc plated

INSTALLATION:

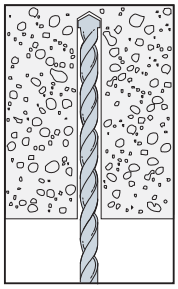
- Caution: Oversized holes in the base material will reduce or eliminate the mechanical interlock of the threads with base material and will reduce the anchor's load capacity. Use a Titen HD® Rod Hanger one time only. Installing the anchor multiple times may result in excessive thread wear and reduce load capacity.

CODES: ICC-ES ESR-2713 *(THD37212RH and THD50234RH)*, Factory Mutual 3031136 *(THD37212RH and THD50234RH)*

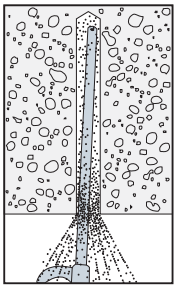
Titen HD® Rod Hanger Product Data

Size	Model No.	Accepts Rod Dia. (in.)	Drill Bit Dia. (in.)	Min. Embed.	Quantity	
					Box	Carton
⅜" x 2½"	THD37212RH	⅜"	⅜"	2½"	50	200
½" x 2¾"	THD50234RH	½"	⅜"	2¾"	50	200

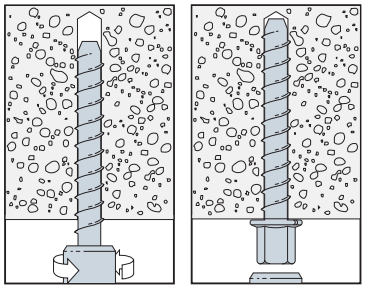
Installation Sequence



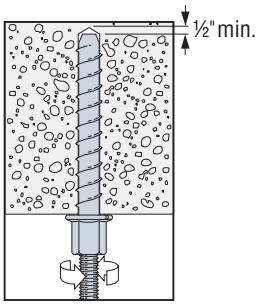
1. Drill a hole using the specified diameter carbide bit into the base material to a depth of at least ½" deeper than the required embedment.



2. Blow the hole clean of dust and debris using compressed air.



3. Insert anchor into the hole. Tighten the anchor with an impact wrench or a torque wrench into the base material until the hex washer head contacts the base material.



4. Install threaded rod in the anchor to support pipes, wiring, etc.

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

Characteristic	Symbol	Units	Catalog Number	
			THD37212RH	THD50234RH
Installation Information				
Rod Hanger Diameter	d_o	in.	⅜	½
Drill Bit Diameter	d	in.	⅜	⅜
Maximum Installation Torque[2]	$T_{inst,max}$	ft-lbf	50	50
Maximum Impact Wrench Torque Rating[3]	$T_{impact,max}$	ft-lbf	150	150
Minimum Hole Depth	h_{hole}	in.	3	3¼
Embedment Depth	h_{nom}	in.	2½	2¾
Effective Embedment Depth	h_{ef}	in.	1.77	1.77
Critical Edge Distance	c_{ac}	in.	2 11/16	2 11/16
Minimum Edge Distance	c_{min}	in.	1¾	
Minimum Spacing	s_{min}	in.	3	
Minimum Concrete Thickness	h_{min}	in.	3¾	3¾
Anchor Data				
Yield Strength	f_{ya}	psi	97,000	
Tensile Strength	f_{uta}	psi	110,000	
Minimum Tensile and Shear Stress Area	A_{se}	in²	0.099	0.099
Axial Stiffness in Service Load Range – Uncracked Concrete	β_{uncr}	lb/in.	715,000	
Axial Stiffness in Service Load Range – Cracked Concrete	β_{cr}	lb/in.	345,000	

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318 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.

Strength Design Values for Titen HD® Rod Hanger in Tension for Installations in Concrete[1,6,7]

Characteristic	Symbol	Units	Catalog Number	
			THD37212RH	THD50234RH
Anchor Category	1, 2 or 3	—	1	
Embedment Depth	h_{nom}	in.	2½	2¾
Steel Strength in Tension (ACI 318 Section D.5.1)				
Tension Resistance of Steel	N_{sa}	lbf	10,890	10,890
Strength Reduction Factor – Steel Failure[2]	φ_{sa}	—	0.65	
Concrete Breakout Strength in Tension (ACI 318 Section D.5.2)[6]				
Effective Embedment Depth	h_{ef}	in.	1.77	1.77
Critical Edge Distance	c_{ac}	in.	$2^{11}/_{16}$	$2^{11}/_{16}$
Effectiveness Factor – Uncracked Concrete	k_{uncr}	—	24	
Effectiveness Factor – Cracked Concrete	k_{cr}	—	17	
Modification Factor	$\psi_{c,N}$	—	1.0	
Strength Reduction Factor – Concrete Breakout Failure[5]	φ_{cb}	—	0.65	
Pullout Strength in Tension (ACI 318 Section D.5.3)[7]				
Pullout Resistance – Uncracked Concrete (f'_c = 2500 psi)	$N_{p,uncr}$	lbf	2,025[3]	2,025[3]
Pullout Resistance – Cracked Concrete (f'_c = 2500 psi)	$N_{p,cr}$	lbf	1,235[3]	1,235[3]
Strength Reduction Factor – Pullout Failure[4]	φ_p	—	0.65	
Tension Strength for Seismic Applications (ACI 318 Section D.3.3.3)				
Nominal Pullout Strength for Seismic Loads (f'_c = 2500 psi)	$N_{p,eq}$	lbf	1,235[3]	1,235[3]
Strength Reduction Factor – Pullout Failure[4]	φ_{eq}	—	0.65	

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318 Appendix D, except as modified below.
2. The value of ϕ applies when the load combinations of ACI 318 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ. Anchors are considered brittle steel elements.
3. Adjust the characteristic pullout resistance for other concrete compressive strengths by multiplying the tabular value by $(f'_{c,specified}/2500)^{0.5}$.
4. The value of ϕ applies when both the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ.
5. The value of ϕ applies when both the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition B are met. If the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition A are met, refer to Section D4.4 to determine the appropriate value of ϕ. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ.
6. For sand-lightweight concrete, in lieu of ACI 318 Section D.3.4, modify the value of N_n by multiplying all values of $\sqrt{f'_c}$ affecting N_n by 0.60. All-lightweight concrete is beyond the scope of this table.
7. For sand-lightweight concrete, modify the value of $N_{p,cr}$, $N_{p,uncr}$ and $N_{p,eq}$ by 0.60. All-lightweight concrete is beyond the scope of this table.

Titen HD® Rod Hanger

Strength Design Values for Titen HD® Rod Hanger in Tension for Installations in the Lower and Upper Flute of Normal-Weight or Sand-Lightweight Concrete through Metal Deck[1,2,5,6]

Characteristic	Symbol	Units	Catalog Number	
			THD37212RH	THD50234RH
Minimum Hole Depth	h_{hole}	in.	3	3¼
Embedment Depth	h_{nom}	in.	2½	2¾
Effective Embedment Depth	h_{ef}	in.	1.77	1.77
Pullout Resistance – Cracked Concrete[2,3,4]	$N_{p,deck,cr}$	lbf	1145	1145
Pullout Resistance – Uncracked Concrete[2,3,4]	$N_{p,deck,uncr}$	lbf	1430	1430

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318 Appendix D, except as modified below.
2. Concrete compressive strength shall be 3000 psi minimum. The characteristic pullout resistance for greater compressive strengths shall be increased by multiplying the tabular value by $(f'_{c,\ specified}/3000\ psi)^{0.5}$.
3. For anchors installed in the soffit of sand-lightweight or normal-weight concrete over metal deck floor and roof assemblies, as shown in Figure A, calculation of the concrete breakout strength may be omitted.
4. In accordance with ACI 318 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-metal-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.

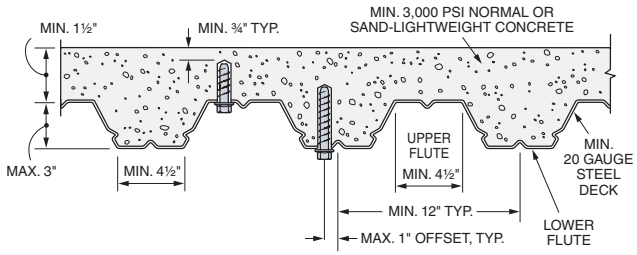


Figure A – Installation in Concrete Over Metal Deck

Allowable Stress Design (ASD) Values for Titen HD® Rod Hanger with ¼" and ⅜" Shanks Tension Loads in Normal-Weight Concrete

Catalog Number	Rod Hanger Dia. (in.)	Drill Bit Dia. (in.)	Emb. Depth (in.)	Critical Edge Distance (in.)	Critical Spacing Distance (in.)	Tension Load			
						$f'_c \geq 2000$ psi Concrete		$f'_c \geq 4000$ psi Concrete	
						Ultimate (lbs.)	Allowable (lbs.)	Ultimate (lbs.)	Allowable (lbs.)
THD25112RH	¼	¼	1½	3	6	1319	330	2102	525
THD37218RH	⅜	¼	2⅛	3	6	2210	555	3227	805
THD37212RH	⅜	⅜	2½	3	6	3650	915	5275	1320
THD50234RH	½	⅜	2¾	3	6	4297	1075	6204	1550

1. The allowable loads listed are based on a safety factor of 4.0.
2. Refer to allowable load-adjustment factors for spacing and edge distance on pages 128–129 in the current Simpson Strong-Tie® *Anchoring and Fastening Systems for Concrete and Masonry* catalog.
3. The minimum concrete thickness is 1½ times the embedment depth.
4. Allowable load may be interpolated for concrete compressive strengths between 2000 psi and 4000 psi.

800-999-5099
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