X-HS Threaded Rod Hanger Assemblies

Supplement to Hilti North American Product Technical Guide

2008 Edition

X-HS Threaded Rod Hanger Assemblies 1.0

1.1 Product Description

The Hilti X-HS threaded rod hanger assemblies consist of pre-mounted X-U Universal powder-actuated fasteners and cold-formed steel brackets (threaded rod hangers) having a 1/4" or 3/8" diameter (6.4 or 9.5 mm) internally threaded hole to accommodate connection of 1/4" or 3/8" UNC threaded steel rods, respectively.

1.2 Material Specifications

Fastener Designation	Powder-Actuated Fastener Material	Powder-Actuated Fastener Plating	Clip/Hanger[1] Material	Clip/Hanger[1] Plating
X-HS U27	Carbon Steel	5 μm Zinc	Carbon Steel	9 μm Zinc
X-HS U19	Carbon Steel	5 μm Zinc	Carbon Steel	19 μm Zinc

1 Clip/hanger material and plating apply to both 1/4" and 3/8" UNC diameter X-HS Threaded Rod Assemblies with low-velocity powder-actuated fasteners.

Approvals

ICC-ES (International Code Council)
Pending

FM (Factory Mutual)
Pipe Hanger Component for Automatic Sprinkler Systems.

UL (Underwriters Laboratories)
Fasteners for Conduit and Cable Hardware.
Pipe hanger equipment for fire protection service in steel base material - pending

1.3 Technical Data

Allowable Loads for Hilti X-HS Threaded Rod Assemblies Installed in Normal Weight Concrete[1,2,3,4,5,6,7]

Description	Concrete Compressive Strength					
	2000 psi			4000 psi		
	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)
X-HS U27	**75** (0.33)	**100** (0.44)	**60** (0.27)	**85** (0.38)	**150** (0.67)	**130** (0.58)

1 The tabulated allowable load values are for the X-HS threaded rod hanger assembly with low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC 70. Threaded rod must be investigated in accordance with accepted design criteria.
2 Fasteners shall not be driven until the concrete has reached the specified compressive strength.
3 Concrete material thickness at the point of penetration must be three times the depth of embedment.
4 Nailhead Standoff, h_{NVS}, shall be less than or equal to 5/16". Reference Section 1.4.
5 Multiple fasteners are recommended for any attachment.
6 Allowable loads apply to both the 1/4" and 3/8" UNC diameter X-HS threaded rod assemblies with low-velocity powder-actuated fasteners.
7 Reference Section 1.4 for load directions.

Allowable Loads for Hilti X-HS Threaded Rod Assemblies Installed in Structural Lightweight Concrete and Composite Steel Deck[1,2,4,5,6,7,8,9]

Description	Fastener Location														
	Installed into Lightweight Concrete[3]			Installed through 1-1/2 in. Deep Metal Deck into Concrete[4]						Installed through 3 in. Deep Metal Deck into Concrete[5]					
				Upper Flute			Lower Flute			Upper Flute			Lower Flute		
	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)	Tension **lb** (kN)	Shear **lb** (kN)	45 Degree **lb** (kN)
X-HS U27	**95** (0.42)	**200** (0.89)	**105** (0.47)	**140** (0.62)	**225** (1.00)	**165** (0.73)	**140** (0.62)	**220** (0.98)	**165** (0.73)	**125** (0.56)	**225** (1.00)	**200** (0.89)	**125** (0.56)	**225** (1.00)	**150** (0.67)

1 The tabulated allowable load values are for the X-HS threaded rod hanger assembly with low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC 70. Threaded rod must be investigated in accordance with accepted design criteria.
2 Fasteners shall not be driven until the concrete has reached the specified compressive strength.
3 Concrete material thickness at the point of penetration must be three times the depth of embedment.
4 Deck is a minimum No. 20 gage (0.0359"), with minimum yield strength of 33,000 psi.
5 Nailhead Standoff, h_{NVS}, shall be less than or equal to 5/16". Reference Section 1.4.
5 Multiple fasteners are recommended for any attachment.
6 Allowable loads apply to both the 1/4" and 3/8" UNC diameter X-HS threaded rod assemblies with low-velocity powder-actuated fasteners.
7 Reference Figures 1, 2 and 3 for nominal flute dimensions, fastener locations, and load orientations.
9 Reference Section 1.4 for load directions.

X-HS Threaded Rod Hanger Assemblies 1.0

Allowable Loads for Hilti X-HS Threaded Rod Assemblies Installed in Minimum ASTM A36 Structural Steel[1,2,3,4,5]

Description	Steel Thickness (in.)											
	3/16			1/4			3/8			≥ 1/2		
	Tension lb (kN)	Shear lb (kN)	45 Degree lb (kN)	Tension lb (kN)	Shear lb (kN)	45 Degree lb (kN)	Tension lb (kN)	Shear lb (kN)	45 Degree lb (kN)	Tension lb (kN)	Shear lb (kN)	45 Degree lb (kN)
X-HS U19	**270** (1.20)	**240** (1.07)	**275** (1.22)	**270** (1.20)	**240** (1.07)	**275** (1.22)	**270** (1.20)	**240** (1.07)	**280** (1.25)	**280** (1.25)	**245** (1.09)	**290** (1.29)

1 The tabulated allowable load values are for the X-HS threaded rod hanger assembly with low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC 70. Threaded rod must be investigated in accordance with accepted design criteria.

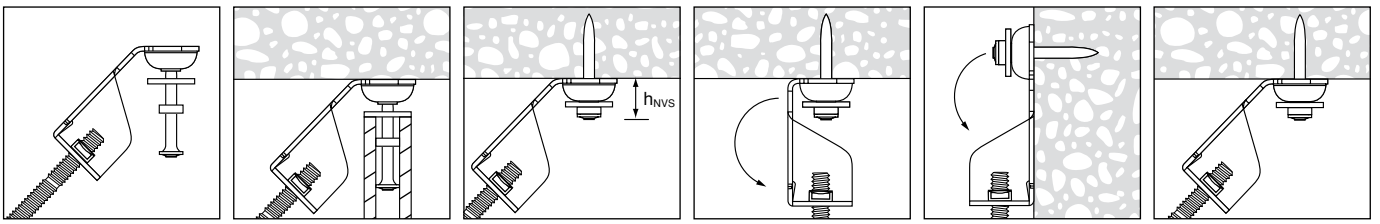
2 Nailhead Standoff, h_{NVS}, shall be less than or equal to 3/8". Reference Section 1.4.

3 Multiple fasteners are recommended for any attachment.

4 Allowable loads apply to both the 1/4" and 3/8" UNC diameter X-HS threaded rod assemblies with low-velocity powder-actuated fasteners.

5 Reference Section 1.4 for load directions.

1.4 X-HS Installation Instructions and Load Directions

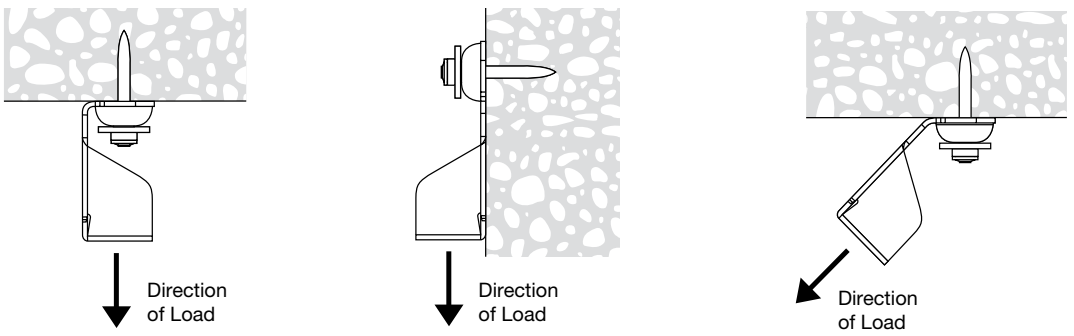


1 Insert appropriate sized threaded rod into hanger.

2 Press tip of fastener to concrete/steel base material. Drive with Hilti powder-actuated tool.

3 Ensure proper nail head stand-off.

4 Bend fastener until threaded rod is in desired angle from the base material surface (Reference drawings 5a, 5b and 5c below).



5a Tension Load

5b Shear Load

5c Combined Load

Figure 1 – Installation Instructions

Note: The X-HS Fastener is intended to be fastened to the base material and bent once from the installed position to vertical or horizontal for ceiling or wall hanger applications, respectively. Excessive bending of the X-HS Fastener through complete back and forth cycles should not exceed three (3) times.

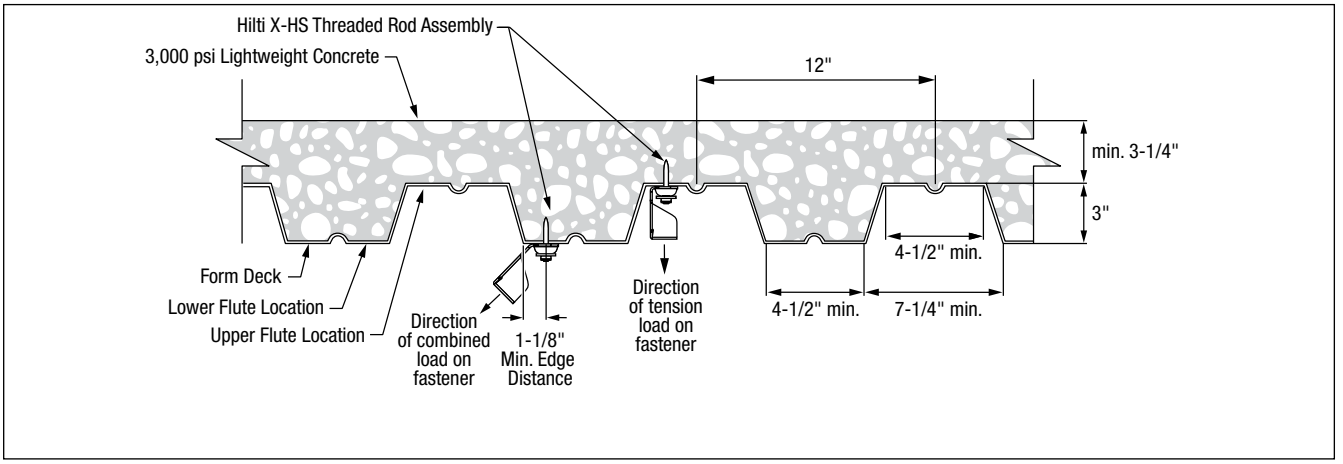


Figure 2 – Hilti X-HS Threaded Rod Hanger Assembly Location 3"-Deep Composite Floor Deck, Normal Deck Profile Orientation

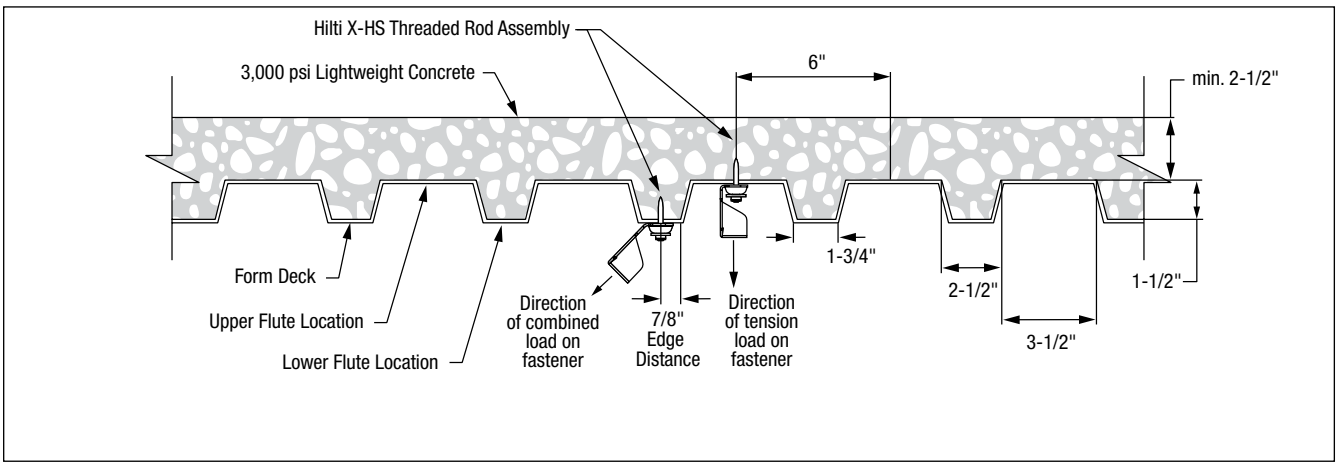


Figure 3 – Hilti X-HS Threaded Rod Hanger Assembly Location 1-1/2"-Deep Composite Floor Deck, Normal Deck Profile Orientation

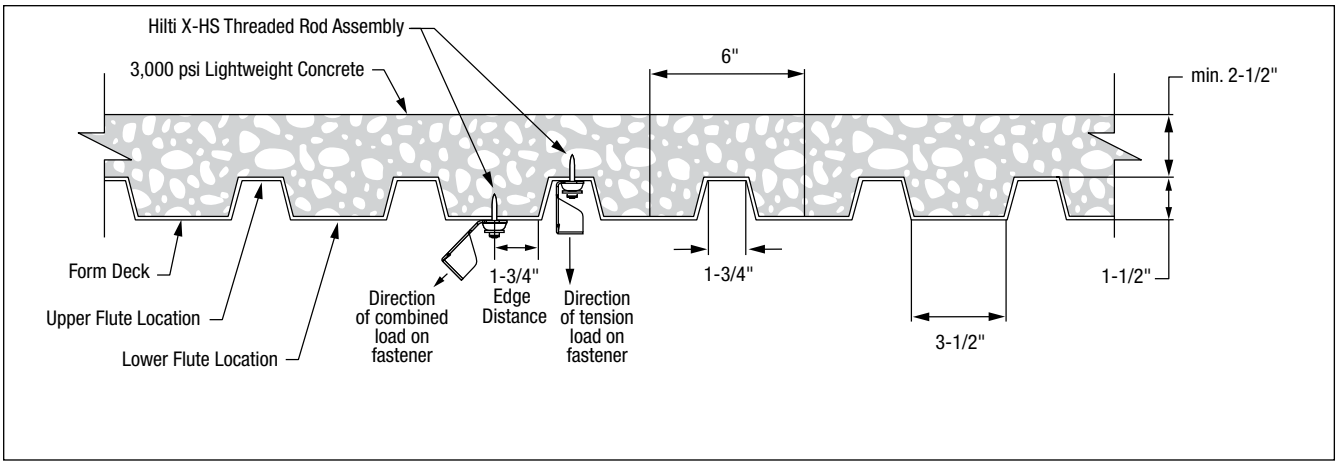


Figure 4 – Hilti X-HS Threaded Rod Hanger Assembly Location 1-1/2"-Deep Composite Floor Deck, Inverted Deck Profile Orientation

1.5 Ordering Information

X-HS & X-HS MX Threaded Rod Hangers

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Thread Rod Ø
Concrete			
X-HS W6 U27	**1** (25)	**0.157** (4.0)	**UNC 1/4-inch**
X-HS W10 U27	**1** (25)	**0.157** (4.0)	**UNC 3/8-inch**
Steel			
X-HS W6 U19	**3/4** (19)	**0.157** (4.0)	**UNC 1/4-inch**
X-HS W10 U19	**3/4** (19)	**0.157** (4.0)	**UNC 3/8-inch**

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