



Attached are page(s) from the 2013 Hilti North American Product Technical Guide Volume 1 Direct Fastening. For complete details on this product, including data development, product specifications, general suitability, installation, corrosion, and spacing and edge distance guidelines, please refer to the full Product Technical Guide, or contact Hilti.

Mechanical/Electrical Clips and Hangers

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- 3.2.11.2 Material Specifications
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Listings/Approvals

ICC-ES (International Code Council)
ESR-2795 (X-HS)

COLA (City of Los Angeles)
RR 25826 (X-HS)

FM (Factory Mutual)
W10-30-27P10, W10-30-32P10 and
W10-30-42P10 fasteners for sprinkler
pipe hangers in concrete

EW10-30-15P10, X-EW10H, X-EW6H
and X-HS U19 fasteners for sprinkler
pipe hangers in steel

UL (Underwriters Laboratories)
X-ECH, X-EKB and X-ECT hangers
for wire positioning devices

W10-30-32P10, W10-30-42P10,
EW10-30-15P10, X-EW10H and X-EW6H
fasteners for sprinkler pipe hangers

Cable and Conduit Hardware Hangers
X-HS W6, X-HS W10 and X-RH



Threaded and Smooth Rod Hangers



Cable and Conduit Attachment

3.2.11.1 Product Description

X-HS and X-HS MX Hangers

Threaded rod hangers available with pre-mounted fasteners (X-HS W6 and X-HS W10) or without pre-mounted fasteners (X-HS W6 MX) for use with magazine tools. For attachment of 1/4" (W6) or 3/8" (W10) threaded rods to concrete or steel.



X-HS and X-HS MX
Threaded Rod Hangers

Threaded Studs with Couplers

For attachment of 1/4" (X-W6) or 3/8" (W10) threaded rods to concrete or steel. More information on Threaded Studs can be found in Sections 3.2.8 and 3.2.9.



X-W6, W10, X-EW6H or
X-EW10H with Coupler

X-RH Rod Hanger

For suspending telecommunications, electrical cable or conduit from concrete ceilings or steel members. It may be used to support smooth or threaded 1/4" diameter rod. The product is UL/cUL listed and plenum rated per NEC requirements. It meets ANSI/TIA/EIA-568-A/-569-A and UL 2239 standards for cable and conduit support devices, which limits center-to-center spacing for hangers to 5'-0" or less.



X-RH Rod Hanger

X-ECH Cable Holder

For suspending telecommunication or electrical cable from concrete or steel. UL/cUL listed, plenum rated (for air handling spaces) per the requirements of UL1565, CAN/CSA C22.2 No. 18.5-02, and National Electric Code Sec. 300-22 (c)(d).



X-ECH Cable Holder

X-EKB MX Cable Clamps

For telecommunications and premise wiring applications. Cable clamp attached directly to base material designed to support multiple cables approximately 1/4" in diameter. UL/cUL listed.



X-EKB MX Cable Clamp

X-ECT Cable Tie Fastener

For telecommunications and premise wiring applications. Cable or conduit support using an adjustable cable tie to secure cable or pipe. UL/cUL listed.



X-ECT MX Cable Tie Fastener

X-BX/EMTC and X-BX/EMTC MX Thin Wall Conduit Clips

Thin wall conduit clips available in thicker premium grade (BX/EMTC) or in thinner standard grade (X-BX/EMTC) with pre-mounted fasteners. Also available without pre-mounted fastener (X-BX/EMTC MX) for use with magazine tools. For fastening thin wall conduit.



X-BX/EMTC and X-BX/EMTC MX
Conduit Clips

X-EMTSC MX Stand-Off Conduit Clips

Similar to EMTC clips to hold conduits away from base material and align conduit to knockouts on junction boxes.



X-EMTSC MX Stand-Off
Conduit Clip

Mechanical/Electrical Clips and Hangers

3.2.11.2 Material Specifications

Clip/Hanger Designation	Powder-Actuated Fastener Material	Powder-Actuated Fastener Plating ¹	Clip/Hanger Material	Clip/Hanger Plating ¹
X-HS W10/W6	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc
X-HS W6 MX	Carbon Steel ¹	5 µm Zinc ²	Carbon Steel	5 µm Zinc
X-ECH	Carbon Steel	5 µm Zinc	Nylon Plastic	N/A
X-RH	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc
X-EKB MX	Carbon Steel ¹	5 µm Zinc ²	Plastic	N/A
X-ECT MX	Carbon Steel ¹	5 µm Zinc ²	Plastic	N/A
X-BX/EMTC	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc
X-BX/EMTC MX	Carbon Steel ¹	5 µm Zinc ²	Carbon Steel	5 µm Zinc
X-EMTSC MX	Carbon Steel ¹	5 µm Zinc ²	Carbon Steel	5 µm Zinc

- The 5 µm coating is in accordance with ASTM B633, SC1, Type III. Reference Section 2.3.3.1 for more information.
- Noted clips/hangers do not come with a pre-mounted powder-actuated fastener. Material and plating information provided for the powder-actuated fasteners commonly used with these clips.

3.2.11.3 Technical Data

Allowable Loads in Normal Weight Concrete³

Description	Fastener	Shank Diameter in. (mm)	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)
Threaded Rod Hanger with pre-mounted fastener	X-HS U32 ¹	0.157 (4.0)	75 (0.33)	100 (0.44)	60 (0.27)	85 (0.38)	150 (0.67)	120 (0.53)
	X-HS U22 ²	0.157 (4.0)	50 (0.22)	-	-	50 (0.22)	-	-
X-RH 1/4" Rod Hanger	X-RH 1/4 U27 ²	0.157 (4.0)	-	-	-	50 (0.22)	-	-

- The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70.
- The tabulated allowable load values for X-RH and X-HS U22 are per UL 2239 with a minimum embedment of 3/4" for X-RH.
- Multiple fasteners are recommended for any attachment. Threaded or smooth rod must be investigated in accordance with accepted design criteria.

Allowable Loads in Minimum $f'_c = 3000$ psi Structural Lightweight Concrete^{1,4,5}

Fastener	Shank Diameter	Fastener Location														
		Installed into Concrete			Installed Through 3" Deep Metal Deck into Concrete ²						Installed Through 1-1/2" Deep Metal Deck into Concrete ³					
					Upper Flute			Lower Flute			Upper Flute			Lower Flute		
		Tension	Shear	45-Degree	Tension	Shear	45-Degree	Tension	Shear	45-Degree	Tension	Shear	45-Degree	Tension	Shear	45-Degree
X-HS U32	0.157 (4.0)	95 (0.42)	115 (0.51)	105 ⁶ (0.47)	125 (0.56)	220 (0.98)	175 ⁶ (0.78)	95 (0.42)	220 (0.98)	135 ⁶ (0.60)	95 (0.42)	220 (0.98)	135 ⁶ (0.60)	95 (0.42)	220 (0.98)	135 ⁶ (0.60)

- The tabulated allowable load values are for the X-HS threaded rod hanger assembly with an X-U fastener only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Threaded rod must be investigated in accordance with accepted design criteria.
- The steel deck profile for the 3" deep composite floor deck has a minimum thickness of 20 gauge (0.0358") and a minimum F_y of 33 ksi. Lower and upper flute width must be a minimum of 4-1/2". Figure 1 in Section 3.2.1.1.6 shows the nominal flute dimensions, fastener locations and load orientations for the deck profile. Structural lightweight concrete fill above top of steel deck must be minimum 3-1/4".
- The steel deck profile for the 1-1/2" deep composite floor deck has a minimum thickness of 20 gauge (0.0358") and a minimum F_y of 33 ksi. Lower flute and upper flute widths must be a minimum of 1-3/4" and 3-1/2", respectively. This deck may also be inverted as shown in Figure 3 in Section 3.2.1.1.6. Figures 2 and 3 in Section 3.2.1.1.6 show the nominal flute dimensions, fastener locations and load orientations for the deck profile. Structural lightweight concrete fill above top of steel deck must be minimum 2-1/2".
- Nailhead Standoff, h_{NVS} , must be less than or equal to 3/8" for the X-HS U32 hanger assembly. Reference Section 3.2.11.4.
- Allowable loads apply to X-HS threaded rod hanger assemblies with either the 1/4" or 3/8" diameter internally threaded hole.
- Allowable loads for 45-degree applications are based on testing. For allowable loads at other angles of installation, refer to Section 3.2.1.1.8.

Mechanical/Electrical Clips and Hangers

Allowable Loads in Minimum ASTM A36 ($F_y \geq 36$ ksi; $F_u \geq 58$ ksi) Steel^{1,3,4,5}

Fastener Description	Fastener	Shank Diameter in. (mm)	Steel Thickness in. (mm)											
			3/16 (4.8)			1/4 (6.4)			3/8 (9.5)			1/2 (12.7)		
			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)
Threaded Rod Hanger with pre-mounted fastener	X-HS U19	0.157 (4.0)	270 (1.20)	220 (0.98)	275 (1.22)	270 (1.20)	220 (0.98)	275 (1.22)	270 (1.20)	220 (0.98)	275 (1.22)	270 (1.20)	220 (0.98)	275 (1.22)
X-RH 1/4" Rod Hanger	X-RH 1/4 U27 ²	0.157 (4.0)	50 (4.0)	-	-	50 (0.22)	-	-	-	-	-	-	-	-

- 1 The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Threaded rod must be investigated in accordance with accepted design criteria.
- 2 The tabulated allowable load values for the X-RH are per UL 2239.
- 3 Low-velocity fasteners shall be driven to where the point of the fastener penetrates the steel base material in accordance with Section 3.2.1.2.3.
- 4 Multiple fasteners are recommended for any attachment. Reference Section 3.2.11.4 for installation instructions for X-HS.
- 5 Allowable loads for 45-degree applications are based on testing. For allowable loads at other angles of installation, refer to Section 3.2.1.2.8.

Maximum Load Rating for X-ECH Cable Holder¹

Fastener Designation	Fastener Size	Maximum Load Rating lb (kN)
X-ECH/FR-S	Small	40 (0.18)
X-ECH/FR-M	Medium	40 (0.18)
X-ECH/FR-L	Large	100 (0.44)

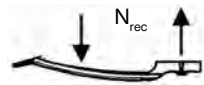
- 1 Maximum Load Rating per UL listing.

Allowable Loads Values for MX Version Hangers and Clips^{1,3,4,5,6}

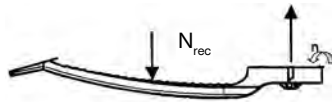
X-HS W6 MX
Allowable Load N_{rec}
Tensile lb (kN)
15 (0.07)



X-EKB 4 MX
Allowable Load N_{rec}
Tensile lb (kN)
5 (0.02)



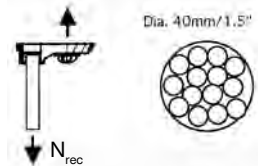
X-EKB 8 MX
Allowable Load N_{rec}
Tensile lb (kN)
10 (0.04)



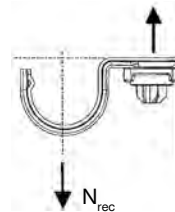
X-EKB 16 MX
Allowable Load N_{rec}
Tensile lb (kN)
15 (0.07)



X-ECT MX
Allowable Load N_{rec}
Tensile lb (kN)
10 (0.04)



X-BX 3/8" MX ² X-EMTC 1" MX ²
Allowable Load N_{rec}
Tensile lb (kN)
10 (0.04)



X-EMTSC 1/2" MX X-EMTSC 1" MX
Allowable Load N_{rec}
Tensile lb (kN)
15 (0.07)

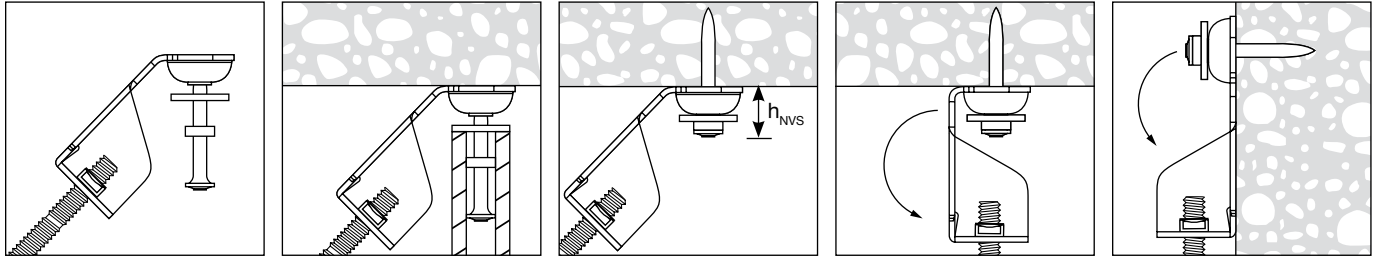


- 1 The allowable load capacities are based on tests with X-GHP 20, X-GN 27 and X-EGN 14 using a safety factor that is greater than or equal to 5.0.
- 2 Load capacities are based on armored cable and EMT.
- 3 X-GHP 20 must be installed at a minimum penetration depth of 9/16" into concrete. X-GN 27 must be installed at a minimum penetration depth of 3/4" into CMU or mortar joint. X-EGN 14 must be installed at a minimum penetration depth of 0.320" through or into steel. Hanger assemblies must be firmly clamped to the base material.
- 4 Concrete base materials include 2000 to 6000 psi normal weight or lightweight types and also includes attachment through steel deck into concrete.
- 5 Steel base materials include 1/8" or thicker carbon steel base material with minimum yield strengths (F_y) of 36 ksi.
- 6 CMU base materials include hollow or grout-filled concrete masonry units conforming to ASTM C90.

Mechanical/Electrical Clips and Hangers

3.2.11.4 X-HS Installation Instructions

X-HS Installation Instructions*



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 fastener embedment. $h_{NVS} \leq 3/8'' (9.5 \text{ mm})$
4. Bend fastener until threaded rod is in desired location, vertical or horizontal for ceiling or wall hanger applications, respectively.

* These are abbreviated instructions which may vary by application. **ALWAYS** review/follow the instructions accompanying the product.

3.2.11.5 Ordering Information

X-HS and X-HS MX Threaded Rod Hangers

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Thread Rod Ø
Concrete			
X-HS W6 U32 P8S15	1-1/4 (32)	0.157 (4.0)	UNC 1/4-inch
X-HS W10 U32 P8S15	1-1/4 (32)	0.157 (4.0)	UNC 3/8-inch
X-HS W6 U22 P8S15	7/8 (22)	0.157 (4.0)	UNC 1/4-inch
X-HS W10 U22 P8S15	7/8 (22)	0.157 (4.0)	UNC 3/8-inch
Steel			
X-HS W10 U19 P8S15	5/8 (16)	0.157 (4.0)	UNC 3/8-inch
X-HS W6 U19 P8S15	5/8 (16)	0.157 (4.0)	UNC 1/4-inch
MX Version (without pre-mounted fastener)			
X-HS W6 MX	N/A	N/A	UNC 1/4-inch



Threaded Studs

Fastener Description	Shank Length in. (mm)	Fastener Shank Ø in. (mm)	Thread Length in. (mm)	Thread Ø
Concrete and Masonry				
X-W6-11-22 FP8	7/8 (22)	0.145 (3.7)	1/2 (11)	UNC 1/4-inch
X-W6-11-27 FP8	1 (27)	0.145 (3.7)	1/2 (11)	UNC 1/4-inch
X-W6-20-22 FP8	7/8 (22)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch
X-W6-20-27 FP8	1 (27)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch
X-W6-38-27 FP8	1 (27)	0.145 (3.7)	1-1/2 (38)	UNC 1/4-inch
W10-30-27 P10	1 (27)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch
W10-30-32 P10	1-1/4 (32)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch
W10-30-42 P10	1-5/8 (42)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch
Steel				
X-EW6H-11-9 FP8	3/8 (9)	0.145 (3.7)	1/2 (11)	UNC 1/4-inch
X-EW6H-20-9 FP8	3/8 (9)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch
X-EW6H-28-9 FP8	3/8 (9)	0.145 (3.7)	1-1/8 (28)	UNC 1/4-inch
X-EW6H-38-9 FP8	3/8 (9)	0.145 (3.7)	1-1/2 (38)	UNC 1/4-inch
X-EW10H-30-14 P10	9/16 (14)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch



Couplers

Fastener Description	Overall Length in. (mm)	Thread Ø Stud	Thread Ø Rod
Coupler 1/4-20	1 (25)	UNC 1/4-inch	UNC 1/4-inch
Coupler 3/8-16	1-1/8 (28)	UNC 3/8-inch	UNC 3/8-inch
Adapter B-1/4x3/8	7/8 (22)	UNC 1/4-inch	UNC 3/8-inch



Mechanical/Electrical Clips and Hangers

X-RH Rod Hanger

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Rod Ø
Concrete X-RH 1/4 U27	1 (27)	0.157 (4.0)	1/4-inch



X-RH

X-ECH Cable Holder

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Number of 1/4" Ø cables
Without Pre-Mounted Fastener			
X-ECH-F/R-S	N/A	N/A	15-22
X-ECH-F/R-M	N/A	N/A	30-37
X-ECH-F/R-L	N/A	N/A	45-52
With Pre-Mounted Fastener			
X-ECH-F/R-S U37	1-1/2 (37)	0.157 (4.0)	15-22
X-ECH-F/R-M U37	1-1/2 (37)	0.157 (4.0)	30-37
X-ECH-F/R-L U37	1-1/2 (37)	0.157 (4.0)	45-52
Tool Accessories			
ECH Adapter	For use with DX 351 and DX 460-F8		



X-ECH

X-EKB MX Cable Clamps

Fastener Description	Max Diameter of Cable in. (mm)	Maximum No. of Cables
X-EKB 4 MX	1/4 (6)	4
X-EKB 8 MX	1/4 (6)	8
X-EKB 16 MX	1/4 (6)	16



X-EKB MX

X-ECT MX Cable Tie Fastener*

Fastener Description	Cable Tie* Size in. (mm)
X-ECT MX	1/2 (12)

*Cable tie is not available through Hilti.

X-ECT
without Cable Tie

X-BX/EMTC and X-BX/EMTC MX Conduit Clips

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Conduit Ø in. (mm)
Premium Grade (with pre-mounted fastener)			
X-EMTC-3/8" U22	7/8 (22)	0.157 (4.0)	3/8 (10)
X-EMTC-1/2" U22	7/8 (22)	0.157 (4.0)	1/2 (13)
X-EMTC-3/4" U22	7/8 (22)	0.157 (4.0)	3/4 (19)
X-EMTC-1" U22	7/8 (22)	0.157 (4.0)	1 (25)
Standard Grade (with pre-mounted fastener)			
X-EMTC-3/8" C27	1 (27)	0.138 (3.5)	3/8 (10)
X-EMTC-1/2" C27	1 (27)	0.138 (3.5)	1/2 (13)
X-EMTC-3/4" C27	1 (27)	0.138 (3.5)	3/4 (19)
X-EMTC-1" C27	1 (27)	0.138 (3.5)	1 (25)
MX Version (without pre-mounted fastener)			
X-BX 3/8" MX	N/A	N/A	3/8 (10)
X-EMTC 1/2" MX	N/A	N/A	1/2 (13)
X-EMTC 3/4" MX	N/A	N/A	3/4 (19)
X-EMTC 1" MX	N/A	N/A	1 (25)



X-EMTC



X-BX/EMTC MX

X-EMTSC Stand-Off Conduit Clips

Fastener Description	Conduit Ø
MX Version (without pre-mounted fastener)	
X-EMTSC 1/2" MX	1/2 (13)
X-EMTSC 3/4" MX	3/4 (19)
X-EMTSC 1" MX	1 (25)



X-EMTSC MX