



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 18.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

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## 3.2.5 GENERAL APPLICATION FASTENERS

### 3.2.5.1 PRODUCT DESCRIPTION

**X-U\* Universal Series** This universal high performance fastener is designed for applications in concrete and high strength or standard strength steel. The shank diameter is consistent through the fastener offering at 0.157". X-U fastener lengths range from 5/8" through 2-7/8" and are available as single fasteners (P8) or collated (MX) in strips of 10. All X-U fasteners have a unique twist knurling reaching 7/8" from the tip up the shank.

**X-P\* Premium Concrete Fastener** The X-P fastener is optimized for high performance in concrete base materials. With a shank diameter of 0.157", an optimized conical tip design, and high steel hardness, the X-P is designed for demanding concrete applications, in base materials up to 8,000 psi in strength. The X-P fastener is available in lengths ranging from 5/8" to 1 9/16", making it ideal for drywall track to concrete applications. X-P fasteners are available as single fasteners (P8) or collated (MX) in strips of 10.

**X-C Standard Series** The X-C series of fasteners is a cost effective solution for applications in concrete and masonry. This fastener is not suited for fastening to steel base materials. Fastener lengths range from 3/4" through 2-7/8" with a shank diameter of 0.138". X-C fasteners are offered in a single (P8) fastener version as well as in collated (MX) strips of 10.

**X-CR and X-R Fastener Series** The X-CR is a high performance, corrosion resistant fastener equivalent to SAE 316 stainless steel. This fastener is ideally suited for applications where corrosion is a concern whether on concrete or steel base materials. The X-CR is designed mainly for concrete applications and is offered as a single (P8) fastener in lengths from 5/8" through 2-1/8". The X-R fastener is intended for steel applications and is offered in 1/2" shank length. Shank diameter for these fasteners is 0.145" for shank lengths less than 1-1/2" and 0.157" for longer fasteners.

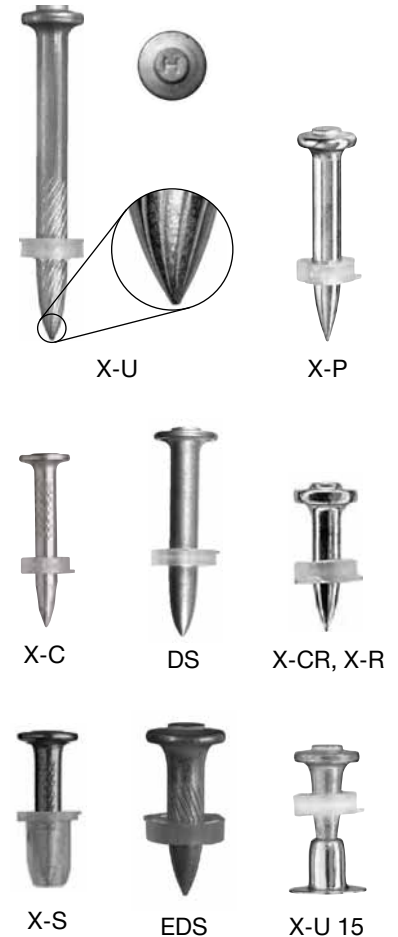
**X-S Steel Fastener** The X-S is an economical fastener for steel. It has a 0.145" smooth shank diameter and is offered in a 1/2" and 5/8" length. The X-S13 comes collated (MX) in strips of 10 or individually with a plastic "tophat" (THP). The X-S16 comes singly with a metal "tophat" (TH). This fastener is ideally suited for fastening drywall track to standard strength steel and is discussed further in Section 3.2.6.

**X-C G2/G3/B3, X-P G2/G3/B3, X-PN G3, X-S B3** These collated fastener lines for Hilti's gas-actuated and battery actuated tools are designed for applications in interior finishing, mechanical and electrical trades. These fasteners are used for fastenings in concrete and masonry (X-C G2/G3/B3 standard, X-P G2/G3/B3 premium), and steel (X-S B3 and X-P G2/G3). For more details refer to Section 3.2.6.

**DS/EDS Fastener Series** The DS series fastener is a high performance fastener of 0.177" shank diameter suitable for both concrete and steel applications. It is offered in a single fastener version only with a 10 mm dome head design and a 10 mm guidance washer. Available lengths are 3/4" through 2-1/2". Knurling is offered on 3/4" and 7/8" lengths; designated as EDS and ideally suited for steel applications.

**X-U 15 Steel Fastener** The X-U 15 is a premium, high performance fastener designed specifically for attachments to steel (e.g. drywall track, tagging, etc.). It is offered in a 0.145" shank diameter and 5/8" length with a unique step shank design as either single fasteners with metal tophat or collated in strips of 10.

3.2.5.1	Product description
3.2.5.2	Material specifications
3.2.5.3	Technical data
3.2.5.4	Ordering information



#### Listings/Approvals

**ICC-ES (International Code Council)**  
 ESR-2269 (X-P, X-U and X-U 15)  
 ESR-1663 (DS, EDS, X-R and X-CR)  
 ESR-1752 with 2017 LABC/LARC  
 Supplement (X-C, X-P G2/G3/B3, X-S)  
**COLA (City of Los Angeles)**  
 RR 25675 (X-P, X-U and X-U 15)  
 RR 25646 (DS, X-C, EDS, and X-CR)



### 3.2.5.2 MATERIAL SPECIFICATIONS

Fastener designation	Fastener material	Fastener plating <sup>1</sup>	Steel washer or clip plating <sup>1,2</sup>	Washer or clip plating <sup>1,2</sup>
X-P*	Carbon Steel	5 µm Zinc	N/A	N/A
X-U*	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc
DS/EDS	Carbon Steel	5 µm Zinc	N/A	N/A
X-C	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc
X-R, X-CR <sup>3</sup>	SAE 316	N/A	SAE 316	N/A
X-C/ X-P/ X-PN/ X-S: G2/G3/B3	Carbon Steel	2-10 µm Zinc	N/A	N/A
X-CT Forming Nail	Carbon Steel	5 µm Zinc	N/A	N/A
BC X-C	Carbon Steel	5 µm Zinc	Carbon Steel	5 µm Zinc

1 The 5 µm zinc coating is in accordance with ASTM B 633, SC 1, Type III. Refer to Section 2.3.3.1 for more information.

2 Most fasteners have a plastic washer for guidance when installing. Not all fastener lengths have a pre-mounted steel washer. Refer to Section 3.2.2.4 for more information on available fasteners.

3 The X-CR and X-R fastener material is a proprietary material, which provides a corrosion resistance equivalent to SAE 316 stainless steel. The steel washer material is SAE 316 stainless steel.

\* More details about the innovative X-P and X-U fasteners can be found in Section 3.2.6.

### 3.2.5.3 TECHNICAL DATA

#### Allowable loads in normal weight concrete<sup>1,2</sup>

Fastener description	Fastener	Shank diameter in. (mm)	Minimum embedment in. (mm)	Concrete compressive strength							
				2000 psi		4000 psi		6000 psi		8000 psi	
				Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
Premium Concrete Fastener	X-P	0.157 (4.0)	3/4 (19)	100 (0.44)	155 (0.69)	100 (0.44)	175 (0.78)	105 (0.47)	205 (0.91)	135 (0.60)	205 (0.91)
			1 (25)	165 (0.73)	220 (0.98)	180 (0.80)	225 (1.00)	150 (0.67)	300 (1.33)	150 (0.67)	215 (0.96)
			1-1/4 (32)	240 (1.07)	310 (1.38)	280 (1.25)	310 (1.38)	180 (0.80)	425 (1.89)	-	-
			1-1/2 (38)	310 (1.38)	420 (1.87)	-	-	-	-	-	-
Universal Knurled Shank Fasteners	X-U	0.157 (4.0)	3/4 (19)	100 (0.44)	125 (0.57)	100 (0.44)	125 (0.57)	105 (0.47)	205 (0.91)	-	-
			1 (25)	165 (0.73)	190 (0.85)	170 (0.76)	225 (1.00)	110 (0.49)	280 (1.25)	-	-
			1-1/4 (32)	240 (1.07)	310 (1.38)	280 (1.25)	310 (1.38)	180 (0.80)	425 (1.89)	-	-
			1-1/2 (38)	275 (1.22)	420 (1.87)	325 (1.45)	420 (1.87)	-	-	-	-
Standard Fastener	X-C (Black collated strip or guidance washer)	0.138 (3.5)	3/4 (19)	45 (0.20)	75 (0.33)	65 (0.29)	105 (0.47)	95 (0.42)	195 (0.87)	-	-
			1 (25)	85 (0.38)	150 (0.67)	160 (0.71)	200 (0.89)	105 (0.47)	270 (1.20)	-	-
			1-1/4 (32)	130 (0.58)	210 (0.93)	270 (1.20)	290 (1.29)	165 (0.73)	325 (1.45)	-	-
			1-1/2 (38)	175 (0.78)	260 (1.16)	270 (1.20)	360 (1.60)	-	-	-	-
Heavy Duty Fastener	DS	0.177 (4.5)	3/4 (19)	50 (0.22)	120 (0.53)	125 (0.56)	135 (0.60)	-	-	-	-
			1 (25)	130 (0.58)	195 (0.87)	155 (0.69)	240 (1.07)	-	-	-	-
			1-1/4 (32)	220 (0.98)	385 (1.71)	270 (1.20)	425 (1.89)	-	-	-	-
			1-1/2 (38)	300 (1.33)	405 (1.80)	355 (1.58)	450 (2.00)	-	-	-	-
Stainless Steel Fastener	X-CR	0.145 (3.7)	3/4 (19)	30 (0.13)	40 (0.18)	65 (0.29)	40 (0.18)	-	-	-	-
			1 (25)	55 (0.24)	185 (0.82)	120 (0.53)	190 (0.85)	100 (0.44)	170 (0.76)	-	-
			1-1/4 (32)	110 (0.49)	290 (1.29)	125 (0.56)	300 (1.33)	120 (0.53)	440 (1.96)	-	-
			1-1/2 (38)	265 (1.18)	405 (1.80)	350 (1.56)	450 (2.00)	-	-	-	-
Gas Fastener	X-C B3, X-C G3	0.118 (3.0)	3/4 (19)	110 (0.5)	190 (0.9)	110 (0.5)	190 (0.9)	110 (0.5)	190 (0.9)	-	-
			5/8 (16)	-	-	50 (0.2)	120 (0.5)	50 (0.2)	90 (0.4)	-	-
Premium Gas Fastener	X-GHP, X-P 17 G2, X-P 20 G2, X-P G3, X-P B3	0.118 (3.0)	3/4 (19)	80 (0.4)	120 (0.5)	-	-	-	-	-	-
			5/8 (16)	-	-	-	-	-	-	-	-
Forming Fastener	X-CT 47 <sup>3</sup>	0.145 (3.7)	1 (25)	60 (0.27)	65 (0.29)	-	-	-	-	-	-
	X-CT 62 <sup>3</sup>	0.145 (3.7)	1 (25)	75 (0.33)	75 (0.33)	-	-	-	-	-	-

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. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.

2 Multiple fasteners are recommended for any attachment.

3 For temporary fastening of formwork only.