

- 3.2.7.1 Product description
- 3.2.7.2 Material specifications
- 3.2.7.3 Technical data
- 3.2.7.4 Ordering information



X-R

**Listings/Approvals**

ICC-ES (International Code Council)  
ESR-1663



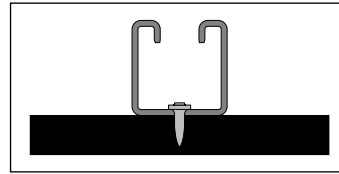
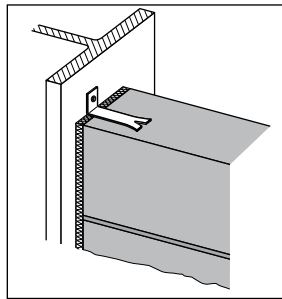
## 3.2.7 X-R FASTENERS FOR FASTENING TO STEEL

### 3.2.7.1 PRODUCT DESCRIPTION

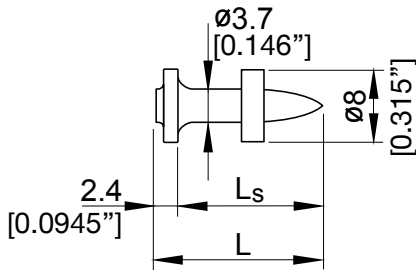
The Hilti X-R powder-actuated fasteners are manufactured from a proprietary CrMnMo alloy which has corrosion resistance for outdoor environments in mildly corrosive conditions where HDG coated parts are commonly specified or used. The proprietary alloy provides a high hardness level, increasing the application limit when compared with traditional alloys. See Material Specification and Application Limit sections with more information.

**Product features:**

- CrMnMo Alloy with improved material hardness
- Base steel thickness from 3/16-inch to full steel\*
- With proper tool and cartridge selection, can be used in base steel material with strength up to 92 ksi
- A superior performance in struts/channels application with improved application limit especially with the use of DX 450 and its narrow access base plate



Typical applications are steel to steel fastenings, e.g. wall ties, struts, channels, etc.



X-R14 P8

### 3.2.7.2 MATERIAL SPECIFICATIONS

Part	Material designation	Tensile strength, Fu ksi (N/mm <sup>2</sup> )
Shank	CrMnMo Alloy P558	≥ 290 (2000)
Guidance washer	Polyethylene	N/A

\* Performance above 1/2" is dependent on steel hardness, see Application limit in steel with more information

3.2.7.3 TECHNICAL DATA

Allowable loads in minimum ASTM A36 (Fy ≥ 36 ksi; Fu ≥ 58 ksi) steel<sup>1,2</sup>

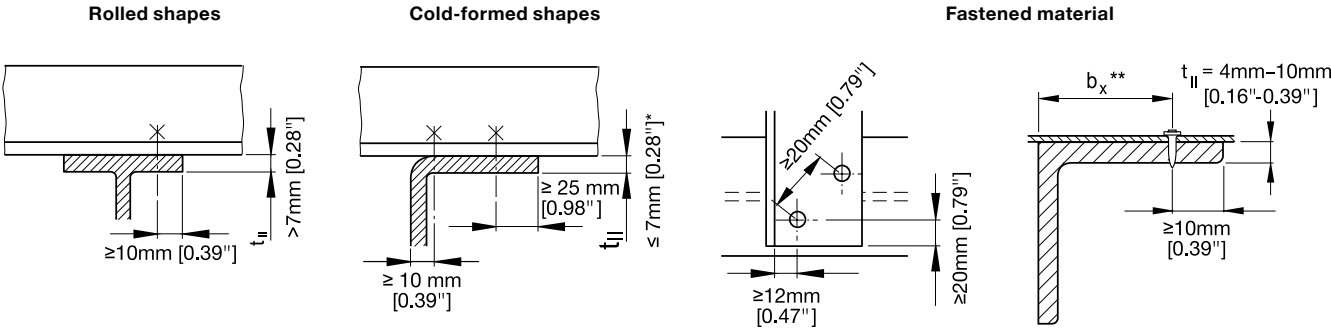
Load type	Steel thickness in.	
	3/16	1/4
Tension lb (kN)	460 (2.05)	615 (2.74)
Shear lb (kN)	460 (2.05)	500 (2.22)

Allowable loads in minimum ASTM Grade 50 (Fy ≥ 50 ksi; Fu ≥ 65 ksi) steel<sup>1,2</sup>

Load type	Steel thickness in.				
	1/8	3/16	1/4	3/8 <sup>3</sup>	1/2 <sup>3</sup>
Tension lb (kN)	300 (1.33)	615 (2.74)	760 (3.38)	220 (0.98)	225 (1.00)
Shear lb (kN)	190 (0.85)	495 (2.20)	500 (2.22)	325 (1.45)	335 (1.49)

- 1 The tabulated allowable load values are for the X-R fasteners only, using a safety factor of 5.0 to the average ultimate values obtained based on testing in accordance with ICC-ES AC70 and ASTM E1190. Some conditions like high wind loads, shock or fatigue may require a different safety factor.
- 2 Fasteners shall be driven to where the point of the fastener penetrates through the steel base material, except as noted.
- 3 Fasteners installed into 3/8" or thicker base may not achieve point penetration through the steel, but require 0.38" minimum penetration depth into the steel.

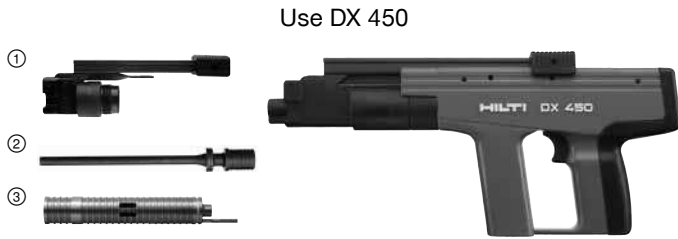
Spacing, edge distances and base material thickness



\*Application limit for cold-formed shapes

\*\*Maximum allowable  $b_x \leq 8 \times t_{II}$

### Application limit in steel

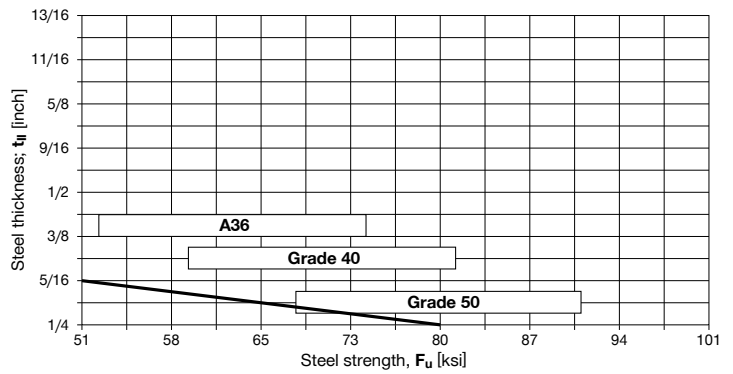
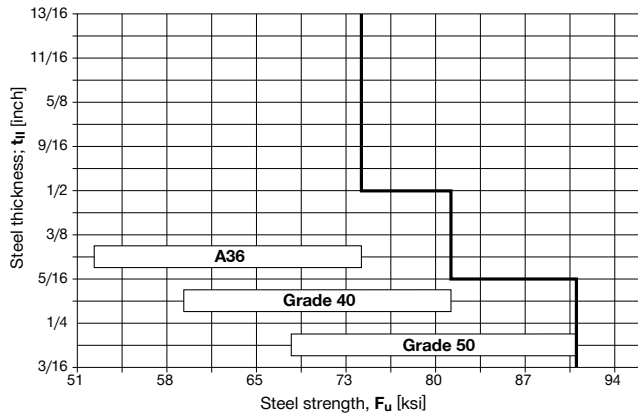


### Tool accessories

- ① Fastener guide and base plate
- ② Piston
- ③ Piston sleeve

### Tool accessories

- ① Fastener guide: X-5-460-F8
- ② Piston: X-5-460-P8



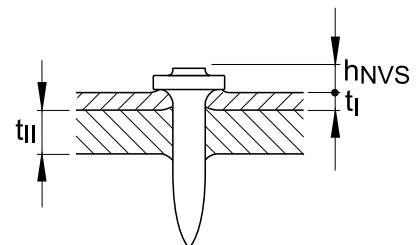
### Typical cartridge selection and tool energy setting

#### DX 450

Base material thickness in.	3/16 - 1/4	1/4 - 5/16	> 5/16
Cartridge, 6.8/11M	Yellow	Red	
Tool energy setting	1.0 - 3.0	2.0 - 3.0	2.5 - 3.0
$h_{NVS}$ in.	1/8 - 3/16	1/8 - 3/16	3/32 - 1/8
$t_I$ in.	$\leq 1/8$		
$t_{II}$ in.	$\geq 3/16$		

#### DX 460 or DX 5

Cartridge, 6.8/11M	Red
$h_{NVS}$ in.	1/8 - 3/16
$t_I$ in.	$\leq 1/32$
$t_{II}$ in.	$\geq 1/4, \leq 5/16$



#### 3.2.7.4 Ordering information

Fastener description	Shank length in. (mm)	Shank $\varnothing$ in. (mm)	Guidance washer $\varnothing$	Qty
X-R14 P8	0.531 (14)	0.145 (3.7)	8 mm Plastic	200