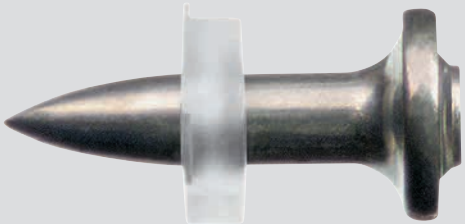
X-CR
DATA SHEET

Stainless steel nail for fastening to steel



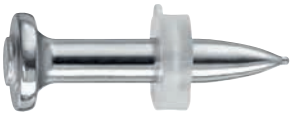
Februar 2025

X-CR Stainless steel nail for fastening to steel

Product data

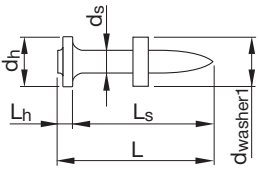
Product description

X-CR P8



- Stainless steel nail
- Corrosion-resistant
- Designed for fastening on steel
- Engineered for high-quality, reliable fastening
- Suitable for universal use

Dimensions for nails without washer

Technical drawing	Product	Shank length L_s	Head height L_h	Shank diameter d_s	Head diameter d_h	Head diameter $d_{washer1}$
	X-CR 16 P8	16 mm	2.4 mm	3.7 mm	8.0 mm	8.0 mm
	X-CR 18 P8	18 mm				
	X-CR 21 P8	21 mm				

Material specification and material properties for stainless steel parts

Product type	Element	Material	Tensile strength R_m	Hardness
X-CR P8	Nails	Stainless steel	1800 MPa	51 HRC

Material specification and material properties for plastic parts

Product type	Element	Material		
X-CR P8	Plastic washer	Polyethylene (PE)		

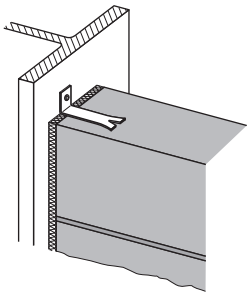
Approvals and certificates

Authority	Approval / certificate	Date of issue	Expiry date	Short description
American Bureau of Shipping (ABS)	21-2146145-PDA	08/21	08/26	– Fastening to steel for shipbuilding – Fastening to steel for off-shore – Fastening to steel for on-shore
Lloyd's register (LR)	LR 97/00078(E4)	01/19	01/24	– Fastening to steel for shipbuilding – Fastening to steel for off-shore – Fastening to steel for on-shore
ICC-ES	ESR-1663	03/21	03/23	– General purpose

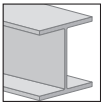
- Information presented in this product data sheet is based on Hilti Technical Data. For the specific application please refer to the corresponding approval/certificate.

Applications

Fastening wall ties

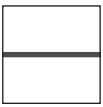


Base materials



Steel

Load conditions



Static / quasi static

Environmental conditions

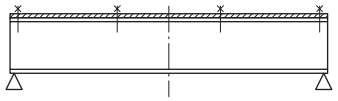
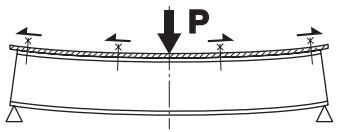
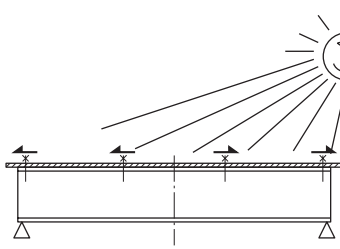
Environmental condition		Product type
		X-CR P8
	Dry indoor	■
	Indoor with temporary condensation	■
	Outdoor with low pollution	■
	Outdoor with moderate concentration of pollutants	■
	Coastal areas	■
	Outdoor, areas with heavy industrial pollution	■
	Close proximity to roads	■
	Special application, e.g. swimming pool	□
	Special application, e.g. tunneling	□

■ = suitable

□ = requires expert evaluation

- For more details, please refer to following technical document(s): Hilti Corrosion Handbook.

Constraint forces

Technical drawing	Description
	No constraint forces, undisturbed system
	Constraint forces due to primary loading and deflection
	Constraint forces due to temperature effect

- When fastening large pieces of steel or aluminium, the possibility of shear loading due to forces of constraint must be taken into account in the fastening design. Allowance must be made for movement or, alternatively, forces of constraint must be taken into account in the design and maximum shear force limited by way of V_{rec}.

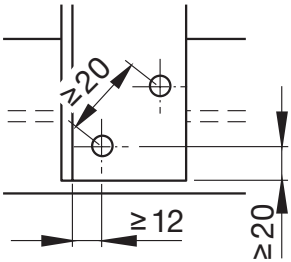
Fastener program

Product categorization

Designation		Technology	Product identifier	Shank length	Collation type	Item no.
Product family	Steel nail					
Product line	X-CR	X	CR			
Product type	X-CR P8	X	CR		P8	
Product	X-CR 16 P8	X	CR	16	P8	247356
	X-CR 18 P8	X	CR	18	P8	247357
	X-CR 21 P8	X	CR	21	P8	247358

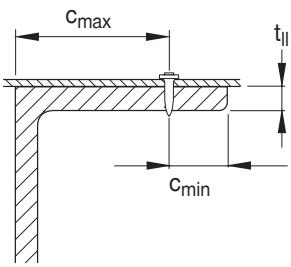
Application recommendation for fastening to steel

Fastened material properties and fastener positioning in fastened material



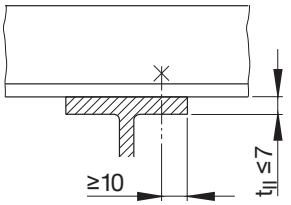
Fastened material type	Steel sheet	Aluminum sheet
Fastened material	Carbon steel, stainless steel	Aluminum
Fastened material tensile strength R_m	≥ 370 MPa	≥ 210 MPa
Fastened material thickness t_I	0.75–9 mm	0.8–2.0 mm
Edge distance c_{min}	12 mm (bordered by formed steel structure)	
Edge distance c_{min}	20 mm	
Fastener spacing s	≥ 20 mm	

Base material properties and fastener positioning in base material

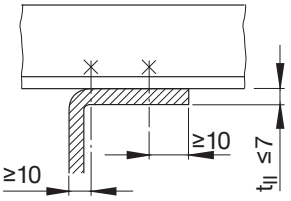


Base material	Steel
Steel grade according to EN 10025-2	S235, S275, S355
Base material tensile strength R_m	360–630 MPa
Base material thickness t_{II}	5–10 mm
Edge distance c_{min}	10 mm
Edge distance c_{max}	8 x t_{II} mm

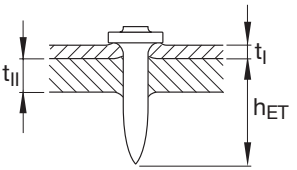
Rolled shape



Cold formed shape



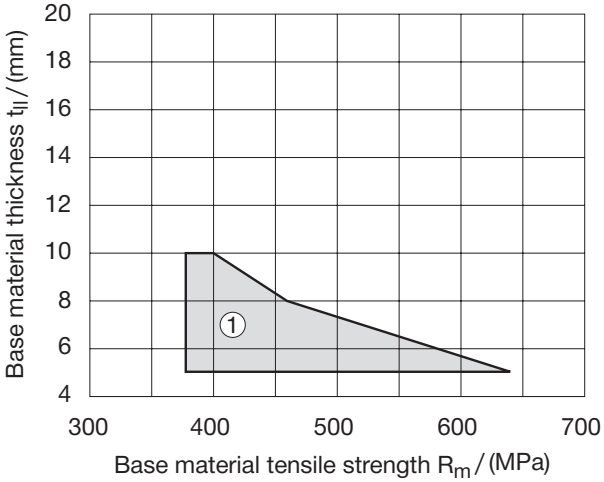
Fastener shank length recommendation



For standard fastening: $L_s = h_{ET} + t_I$

$h_{ET} \geq 9$ mm

Application limitation for fastening on steel



① X-CR 16 P8
with DX 450-FA

- Fastened material thickness $t_I \leq 3$ mm

Performance data

Recommended resistance under tension load, shear load and bending moment

Product	Fastened material	Fastened material thickness t_I	Tension load N_{rec}	Shear load V_{rec}	Bending moment M_{rec}
X-CR 16 P8	Steel sheet	0.75 mm	1.0 kN	1.1 kN	–
		1.00 mm	1.2 kN	1.4 kN	
		1.25 mm	1.5 kN	1.7 kN	
		2.00 mm	2.2 kN	2.0 kN	
	Aluminum sheet	0.80 mm	0.4 kN	0.4 kN	
		1.00 mm	0.6 kN	0.6 kN	
		1.20 mm	0.8 kN	0.9 kN	
		1.50 mm	1.1 kN	1.4 kN	
		2.00 mm	1.6 kN	1.7 kN	
X-CR 16 P8	Woor or soft material	3 mm	1.6 kN	2.0 kN	3.8 Nm
X-CR 18 P8		5–6 mm	1.6 kN	2.0 kN	3.8 Nm
X-CR 21 P8		8–9 mm	1.6 kN	2.0 kN	3.8 Nm

- For intermediate fastened material thicknesses, use load for next smaller thickness.
- Fastened material failure is not considered.
- Recommended loads N_{rec} and V_{rec} are suitable for use in working load design concept:
  Characteristic acting load $N_s \leq N_{rec} = N_{Rk}/g_{global}$, with $g_{global} = 3.0$
  Characteristic acting load $V_s \leq V_{rec} = N_{Rk}/g_{global}$, with $g_{global} = 3.0$

System recommendation

System recommendation for fastening single nails with powder-actuated tools

Product	Powder-actuated tool								Base material			
	DX 6 F8	DX 5 F8	DX 450-FA						Steel S235	Steel S275	Steel S355	
X-CR 16 P8	☐	☐	■						■	■	■	
X-CR 18 P8	☐	☐	☐						☐	☐	☐	
X-CR 21 P8	☐	☐	☐						☐	☐	☐	

■ = recommended, ☐ = feasible

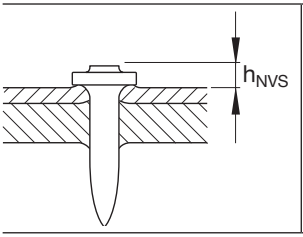
- For more details, please refer to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

Cartridge recommendation

Base material steel grade		Cartridge color (tool power level)		
		Tool type: DX 6 F8	Tool type: DX 5 F8	Tool type: DX 450-FA
		Cartridge type: 6.8/11 M10 for DX6	Cartridge type: 6.8/11 M10	Cartridge type: 6.8/11 M10
S235–S355	$5 \le t_{II} \le 6$ mm			yellow ■ (1–3)
	$6 \le t_{II} \le 8$ mm	titanium ■ (6–8)	red ■ (3–4)	red ■ (2–3)
	$8 \le t_{II} \le 10$ mm			red ■ (2.5–3)

- Tool power level adjustment by setting tests on site (see chapter quality assurance).
- Start tool energy selection with lowest recommended tool power level.
- Correct according requirement from chapter quality assurance.

Fastener stand-off



h_{NVS} = 3.0–4.5 mm

- Visible setting failures must be replaced with a new fastener, not in the same hole.
- These are abbreviated instructions which may vary by application.
- Always review/follow the instructions accompanying the product.