

BX 3 system: fasteners for Mechanical & Electrical and Interior Finishing applications

Product data

BX 3 battery-actuated direct fastening tools



BX 3-ME
BX 3-IF



BX 3 02
BX 3-L 02

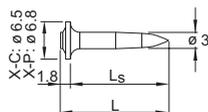
Features and benefits

- Hilti's combustion-free direct fastening technology for driving nails into concrete, steel and some types of solid masonry
- High user comfort thanks to low levels of compression force, noise and recoil
- No disposal of (used) propellant cartridges or gas cans
- Hilti's 22V cordless tool battery platform

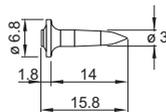
Fasteners and their compatibility

Nails

For fastening to concrete
X-P 17/20/24 B3 MX
X-P 30/36 B3 P7
X-C 20/24/30/36 B3 MX

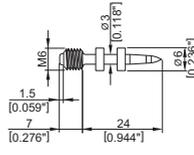


For fastening to steel
X-S 14 B3 MX

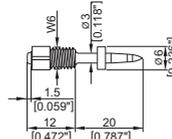


Threaded studs

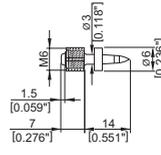
For fastening to concrete
X-M6-7-24 B3 P7



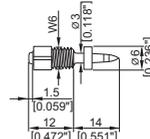
X-W6-12-20 B3 P7



For fastening to steel
X-M6-7-14 B3 P7



X-W6-12-14 B3 P7



	BX 3-ME (01)	BX 3-IF (01)	BX 3 02	BX 3-L 02
X-S 14 B3 MX	yes	yes	yes	yes
X-P 17 B3 MX	yes	yes	yes	yes
X-P 20 B3 MX	yes	yes	yes	yes
X-P 24 B3 MX	yes	yes	yes	yes
X-C 20 B3 MX	yes	yes	yes	yes
X-C 24 B3 MX	yes	yes	yes	yes
X-C 30 B3 MX	no	no	yes	yes
X-C 36 B3 MX	no	no	no	yes
X-M/W_ _ _ B3 P7	yes	yes	no	no
X-P_ B3 P7	yes	yes	no	no
ME MX elements	yes	with ME FG	with ME FG	with ME FG

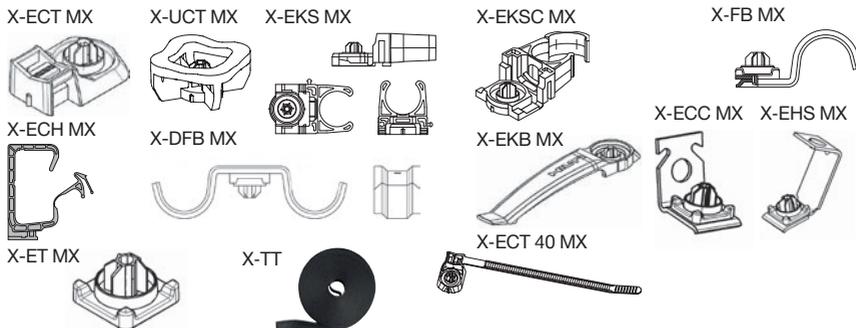
General information

Material specifications

X-P B3 MX/P7, X-S B3 MX
X-C B3 MX

Carbon steel, HRC 57.5, 2-10 µm zinc coating
Carbon steel, HRC 56.5, 5-13 µm zinc coating

Electrical elements to be used with nails



General information

Material specifications

X-ECT MX, X-EKS MX, X-EKSC MX, X-EKB MX, X-ECH MX

X-ECT-FR MX, X-EKB-FR MX

X-UCT MX, X-ET MX

X-TT

X-FB MX, X-DFB MX

X-ECC MX, X-EHS MX

Polyamide (halogen and silicon-free), light grey RAL 7035

PBT (silicon free, flame retardant), stone grey RAL 7030

HDPE (halogen and silicon free), light grey RAL 7035

Polyester (PES)

Galvanized steel sheet, $f_u = 270-420 \text{ N/mm}^2$, 10–20 μm zinc coating

Galvanized steel sheet, $f_u = 270-420 \text{ N/mm}^2$, $\geq 10-20 \mu\text{m}$ zinc coating

Approvals

ICC-ESR 1752 (USA)
ETA-16/0301

X-P 20 B3 MX, X-P 24 B3 MX, various electrical elements (see ETA approval Annex A1)

Applications

With nails



Drywall tracks to concrete and steel



Fastening wood, e.g. Placopan®, to concrete



Junction boxes, switch boxes, etc

With nails and elements



Flexible or rigid cable conduits with cable ties



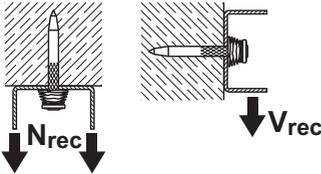
Fastening cables



Cable conduits or light-duty pipes

Performance data

Performance data for drywall track fastening



X-S 14 B3 MX (Base material: steel)

Tension N_{rec} [kN]	Shear V_{rec} [kN]
0.4	0.4

X-P B3, X-C B3 (Base material: concrete / sand-lime masonry)

Embedment [mm]	Recommended Loads [kN]					
	Tension N_{rec}		Shear V_{rec}		Tension N_{rec}	Shear V_{rec}
	Concrete Type				Sand-lime masonry	
	Soft	Tough	Soft	Tough		
≥ 22	-	-	-	-	0.3	0.3
≥ 18	0.2	-	0.2	-	0.2	0.2
≥ 14	0.1	0.1	0.1	0.1	0.1	0.1

Conditions:

- For safety relevant fastenings sufficient redundancy of the entire system is required; Minimum of 5 nails per fastened track. All visible setting failures must be replaced
- Sheet metal failure is not considered in recommended loads and must be assessed separately
- Soft concrete up to $f_{c,cube} = 45 \text{ N/mm}^2$ (C35/45), some tough concrete up to $f_{c,cube} = 60 \text{ N/mm}^2$ (C50/60).
- Concrete with aggregate like granite or river rock or softer, and up to 16 mm diameter



	Stick rate estimation	
	Soft Concrete	Tough concrete
X-P B3	85% – 98%	70% – 85%
X-C B3	75% – 90%	55% – 70%

- The stick rate indicates the percentage of nails that were driven correctly to carry a load. Stick rate can vary from the above values depending on job site conditions.

Performance data

Recommended loads (Threaded studs only)

Threaded stud	Recommended loads and tightening torque			Base material
	N_{rec} [kN]	V_{rec} [kN]	T_{rec} [Nm]	
X-M6-7-24 B3 P7	0.05	0.05	3.0	Concrete, sand-lime masonry
X-W6-12-20 B3 P7				
X-M6-7-14 B3 P7	0.2	0.2	3.0	Steel
X-W6-12-14 B3 P7				

Recommended loads (electrical elements used with nails)

Element	Maximum service load F_{max} [N]
X-ECT (FR) MX	40
X-UCT MX	40
X-EKS MX	11
X-EKSC MX	32
X-FB MX / X-DFB MX	20
X-ECC MX	50
X-EHS MX	80
X-EKB (FR) 4 MX	9
X-EKB (FR) 8 MX	14
X-EKB (FR) 16 MX	18
X-ECH MX	40
	Cable trunking
X-ET MX	100

Conditions:

- Spacing \leq 100 mm
- All visible failures must be replaced

Nail recommendation

 For **concrete** base material

Nail types	Length [mm]	Tip	Shank Ø [mm]	Material	Hardness [HRC]	Coating
X-P B3 P7/MX	17-36	Ballistic	3.0	Carbon steel	57.5	Zinc, 2-10µm

- Premium nails (as listed above) are recommended for use on soft and some tough concrete. For more details regarding nail classification and concrete types, please refer to **Concrete Fastener Selection** section in Hilti Direct Fastening Technology Manual (DFTM)
- X-P 17/20/24 B3 MX to be used with BX 3 02, BX 3-L 02 and BX 3
- X-P 30/36 B3 P7 to be used with BX 3 only

 For **concrete** base material

Nail types	Length [mm]	Tip	Shank Ø [mm]	Material	Hardness [HRC]	Coating
X-C B3 MX	20-36	Cut	3.0	Carbon steel	56.5	Zinc, 5-13µm

- Economical nails (as listed above) are recommended for use on soft concrete only. For more details regarding nail classification and concrete types, please refer to **Concrete Fastener Selection** section in Hilti Direct Fastening Technology Manual (DFTM)
- X-C 20/24/30 B3 MX to be used with BX 3 02
- X-C 20/24/30/36 B3 MX to be used with BX 3-L 02
- X-C 20/24 B3 MX to be used with BX 3

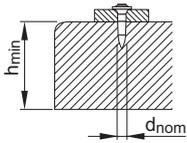
 For **steel** base material

Nail types	Length [mm]	Tip	Shank Ø [mm]	Material	Hardness [HRC]	Coating
X-S 14 B3 MX	14	Ballistic	3.0	Carbon steel	57.5	Zinc, 2-10µm

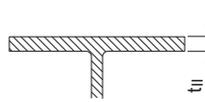
- X-S 14 B3 MX to be used with BX 3 02, BX 3-L 02 and BX 3
- Please refer to next pages for application limits on steel base material

Application requirements

Thickness of base material

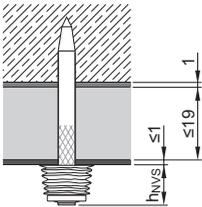


Concrete (for nails and threaded studs)
 $h_{\min} = 60\text{mm}$
 $d_{\text{nom}} = 3.0\text{mm}$



Steel
 $t_{II} \geq 4.0\text{mm}$ (for nails)
 $t_{II} \geq 6.0\text{mm}$ (for threaded studs)

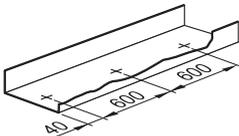
Thickness of fastened material



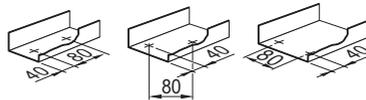
Wooden track: $t_l \leq 27\text{mm}$ (conditions: head of the nail is countersunk flat to the surface)
 Metal track: $t_l \leq 2\text{mm}$
 Deflection head: $t_{l,\text{tot.}} \leq 17\text{mm}$ (gypsum strip + metal track and sealant)

Spacing and edge distances (mm)

Max. spacing along track

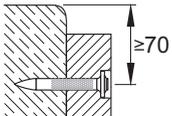


All track ends (cut-outs for doors), secure with 2 nails

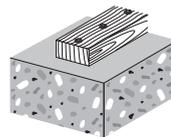
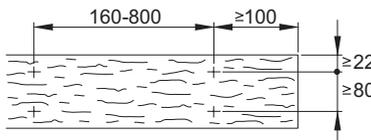


Fastener spacing max. 30 cm for proprietary light non-load-bearing partition walls with fire classification

Distance to edge of concrete / sand-lime masonry

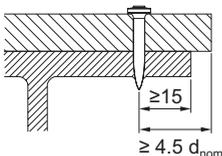


Spacing between nails when fastening wood to concrete



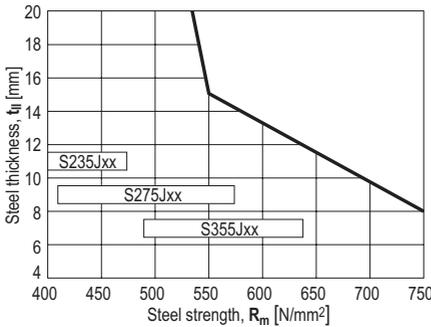
Based on common practice, spacing needs to be adjusted based on specific load requirement and achieved embedment depth.

Distance to edge of fastened material (steel base material)

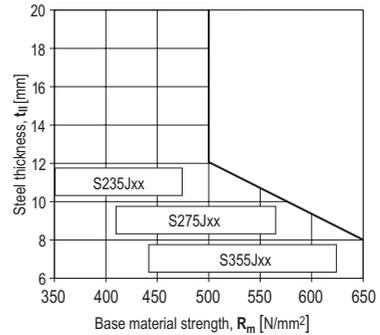


Application limits

X-S 14 B3 MX



X-M6-7-14 B3 P7, X-W6-12-14 B3 P7



Corrosion information

The intended use only comprises fastenings which are not directly exposed to external weather conditions or moist atmospheres, i.e. only intended for dry indoor areas.

Fastener selection and system recommendation

Fastener program

Nails

Nail	Item no.	Shank length (mm)	Shank diameter (mm)	Base material	Length recommendation
X-S 14 B3 MX	2156392, 2156393	14	3	Steel	
X-P 17 B3 MX	2156216, 2156219	17	3	Concrete / Sand-lime masonry	
X-P 20 B3 MX	2156217, 2156390	20	3		
X-P 24 B3 MX	2156218, 2156391	24	3		
X-P 30 B3 P7	2105406	30	3		
X-P 36 B3 P7	2105407	36	3		
X-C 20 B3 MX	2123993	20	3		
X-C 24 B3 MX	2123994	24	3		
X-C 30 B3 MX	2149988	30	3		
X-C 36 B3 MX	2149989	36	3		

Threaded studs

Threaded studs	Item no.	Thread size	Thread length (mm)	Shank length (mm)	Shank diameter (mm)	Base material
X-M6-7-14 B3 P7	2105408	M6	7	14	3	Steel
X-M6-7-24 B3 P7	2105409	M6	7	24	3	Concrete
X-W6-12-14 B3 P7	2105800	W6	12	14	3	Steel
X-W6-12-20 B3 P7	2105801	W6	12	20	3	Concrete

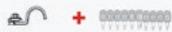
Fastener selection

	Nail Selector for BX 3 			
	Brick	Concrete Floor	Concrete Wall/Ceiling	Steel
	X-C 24 B3 MX	X-C 20 B3 MX X-C 24 B3 MX	X-C 20 B3 MX X-P 17 B3 MX	X-S 14 B3 MX
	-----	X-C 36 B3 P7	-----	-----
	X-C 24 B3 MX X-C 20 B3 MX		X-P 20 B3 MX	X-S 14 B3 MX
	X-P 20 B3 MX X-P 17 B3 MX	-----	X-P 17 B3 MX	X-S 14 B3 MX
	-----	X-C 24 B3 MX X-C 20 B3 MX	-----	X-S 14 B3 MX
	X-W6-12-20 B3 P7 X-M6-7-24 B3 P7			X-W6-12-14 B3 P7 X-M6-7-14 B3 P7
Propellant-free				

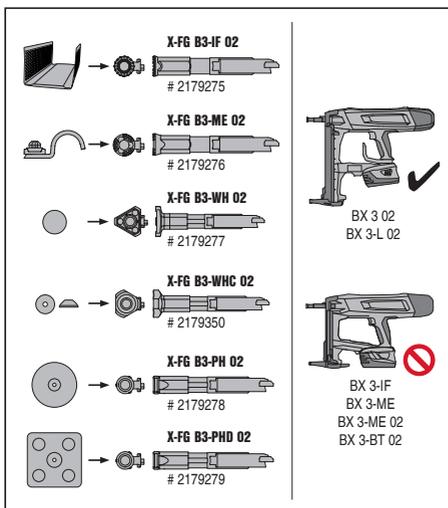
For more details and information, please contact your nearest Hilti representative.

Fastener guide	Item no.	Use
X-FG B3-ME	2101258	With nails + elements or only studs
X-FG B3-IF	2116415	With nails or studs only

Spacing and edge distances (mm)

	Nail Selector for BX 3 02, BX 3-L 02 			
	Brick	Concrete Floor	Concrete Wall/Ceiling	Steel
	X-C 24-36 B3 MX*	X-C 20 B3 MX X-C 24 B3 MX	X-C 20 B3 MX X-P 17 B3 MX	X-S 14 B3 MX
	-----	X-C 36 B3 MX*	-----	-----
	X-C 24 B3 MX X-C 20 B3 MX		X-P 20 B3 MX	X-S 14 B3 MX
	X-P 20 B3 MX X-P 17 B3 MX	-----	X-P 17 B3 MX	X-S 14 B3 MX
	-----	X-C 24 B3 MX X-C 20 B3 MX	-----	X-S 14 B3 MX
No threaded studs				
Propellant-free				

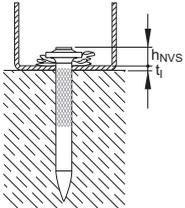
* X-C 36 B3 MX suitable for BX 3-L 02 only



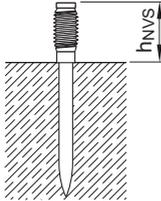
Fastening quality assurance

Fastening inspection

Nails and studs in concrete / sand-lime masonry

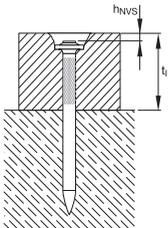


X-C_B3, X-P_B3:
 $h_{NVS} = 2-5 \text{ mm}$

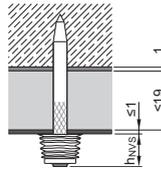


X-M6-7-24 B3 P7
X-W6-12-20 B3 P7

$h_{NVS} \geq 7 \text{ mm}$
 $\geq 12 \text{ mm}$

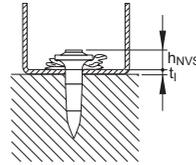


X-C_B3, X-P_B3:
 $h_{NVS} = 2-3 \text{ mm}$

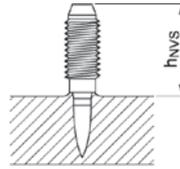


Deflection head
X-P 36 B3 P7, X-C 36 B3 MX
12.5 mm board: $h_{NVS} = 5.5-11.5 \text{ mm}$
15 mm board: $h_{NVS} = 3-9 \text{ mm}$
19 mm board: $h_{NVS} = 0-5 \text{ mm}$

Nails and studs in steel



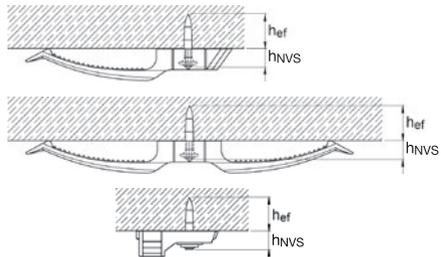
X-S_B3:
 $h_{NVS} = 2-9 \text{ mm}$



X-M6-7-14 B3 P7
X-W6-12-14 B3 P7
 $h_{NVS} \geq 7 \text{ mm}$
 $\geq 12 \text{ mm}$

Element	$h_{NVS} \text{ (mm)}$	
	Concrete	Steel
X-EKB 4/8 MX	6-11	6-9
X-EKB 16 MX	6-11	6-9
X-ECT MX	6-11	6-9
X-UCT MX	6-11	6-9
X-ECH MX	6-11	6-9
X-EKS MX	6-11	6-9
X-EKSC MX	6-11	6-9
X-FB MX	7-11	7-9
X-DFB MX	7-11	7-9
X-ECC MX	7-11	7-9
X-EHS MX	7-11	7-9
X-ET MX*	5-10	5-9

Examples



*) With X-ET MX, the h_{NVS} is measured against the cable trunk.