



BX 3 SYSTEM DATA SHEET

**System Fastener for interior finishing,
building construction, mechanical
and electrical application**



BX 3 System Fastener for interior finishing, building construction, mechanical and electrical application

Product data

Product description

BX 3-ME-22



BX 3-22, BX 3-L-22



- 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 NURON platform

Applications

For fastenings with nails



Drywall tracks to concrete and steel



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



Junction boxes, switch boxes, etc

For fastenings with elements



Flexible or rigid cable conduits with cable ties



Fastening cables



Cable conduits or light-duty pipes

Fastener selection

 BX 3-ME (02),
 BX 3-ME-22 (03), BX 3-IF

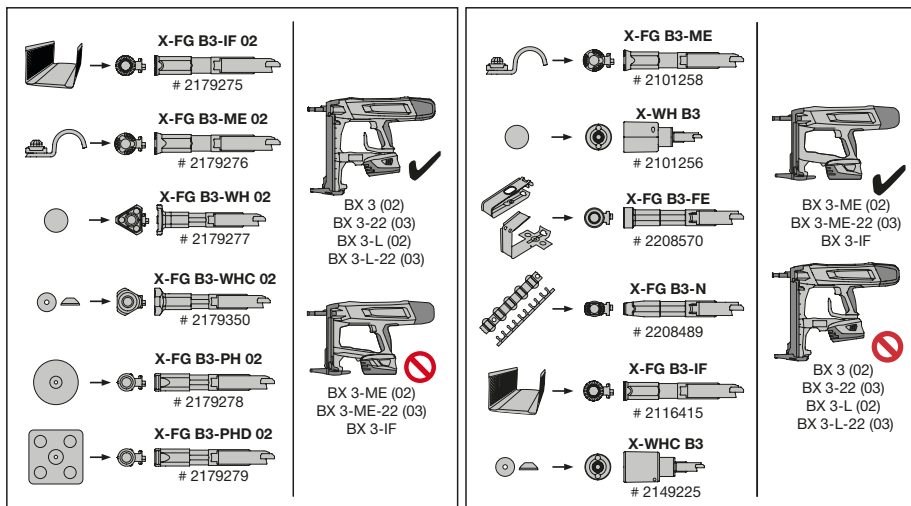

	Base material			
	Brick	Concrete Floor	Concrete Wall/Ceiling	Steel
Track fastening	X-C 24 B3 MX	X-C 20 B3 MX X-C 24 B3 MX	X-C 20 B3 MX X-P 17 B3 MX	X-S 14 B3 MX
Wood fastening	---	X-C 36 B3 P7	---	---
Electrical fastening	X-C 24 B3 MX X-C 20 B3 MX		X-P 20 B3 MX	X-S 14 B3 MX
Modul fastening	X-P 20 B3 MX X-P 17 B3 MX	---	X-P 17 B3 MX	X-S 14 B3 MX
Tape fastening	---	X-C 24 B3 MX X-C 20 B3 MX	---	X-S 14 B3 MX
Equipment fastening	X-W6-12-20 B3 P7 X-M6-7-24 B3 P7			X-W6-12-14 B3 P7 X-M6-7-14 B3 P7

 BX 3 (02), BX 3-22 (03),
 BX 3-L (02), BX 3-L-22 (03)


	Base material			
	Brick	Concrete Floor	Concrete Wall/Ceiling	Steel
Track fastening	X-C 24 B3 MX X-C 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
Wood fastening	---	X-C 36 B3 MX	---	---
Electrical fastening	X-C 24 B3 MX X-C 20 B3 MX		X-P 20 B3 MX	X-S 14 B3 MX
Modul fastening	X-P 20 B3 MX X-P 17 B3 MX	---	X-P 17 B3 MX	X-S 14 B3 MX
Tape fastening	---	X-C 24 B3 MX X-C 20 B3 MX	---	X-S 14 B3 MX



X-C 36 B3 MX suitable for BX 3-L-22



Approvals and certificates

Authority	Approval/certificate	Date of issue	Short description
ICC-ES	ESR 1752	09/2021	X-P 20 B3 MX,
DIBt	ETA-16/0301	06/2021	X-P 24 B3 MX, electrical fastening
	ETA-20-0886	08/2021	X-P 17 B3 MX, X-P 20 B3 MX, track fastening



- Not all information presented in this product data sheet might be subject to approval/certificate content. Please refer to approval/certificate for further information.

Applications

Environmental conditions



Dry indoor



- The intended use comprises fastening in dry conditions.
- For more details, please refer to following technical document: Hilti Corrosion Handbook.

B 3 nails for fastening to concrete and steel

Dimension for fastening nails to steel

Technical drawing	Designation	Shank length L_s	Shank diameter d_s
	X-S 14 B3 MX	14 mm	3.00 mm

Dimension for fastening nails to concrete

Technical drawing	Designation	Shank length L_s	Shank diameter d_s
	X-P 17 B3 MX	17 mm	3.00 mm
	X-P 20 B3 MX	20 mm	
	X-P 24 B3 MX	24 mm	
	X-P 30 B3 P7	30 mm	
	X-P 36 B3 P7	36 mm	
	X-C 20 B3 MX	20 mm	
	X-C 24 B3 MX	24 mm	
	X-C 27 B3 MX	27 mm	
	X-C 36 B3 MX	36 mm	2.75 mm

Material specification and material properties for carbon steel elements

Designation	Element	Material	Coating	Minimum coating thickness	Hardness
X-S 14 B3 MX	Nail	Carbon steel	Zinc	2 μm	57.5 HRC
X-P 17/20/24 B3 MX	Nail	Carbon steel	Zinc	2 μm	57.5 HRC
X-C 20/24/27/30 B3 MX	Nail	Carbon steel	Zinc	5 μm	56.5 HRC
X-C 36 B3 MX	Nail	Carbon steel	Zinc	2 μm	56.5 HRC

Application recommendation

Fastened material properties and fastener positioning in fastened material

	Deflection head	$t_{l, \text{tot}} \leq 21 \text{ mm}$ (gypsum strip + metal track and sealant)
	Metal track	$t_l \leq 2 \text{ mm}$
	Wooden track	$t_l \leq 27 \text{ mm}$ (conditions: head of the nail is countersunk flat to the surface)

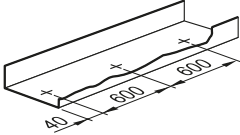
Base material properties and fastener positioning in base material

	Base material	Steel
	Base material thickness t_{II}	$\geq 4 \text{ mm}$
	Base material	Concrete
	Base material thickness h_{min}	60 mm

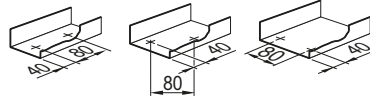
- For more details in relation to base material properties, please refer to the chapter **Fastener selection guide** in the Direct Fastening Manual (DFTM).

Spacing and edge distances (mm)

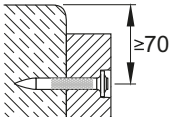
Max. spacing along track



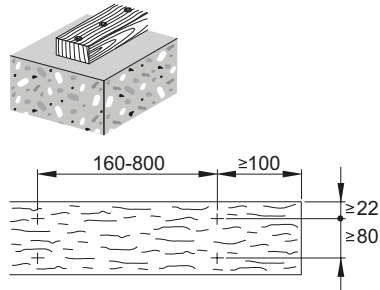
All track ends (cut-outs for doors), secure with 2 nails



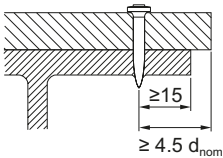
Edge distance for fastening to concrete / sand-lime masonry



Spacing between nails for fastening wood to concrete



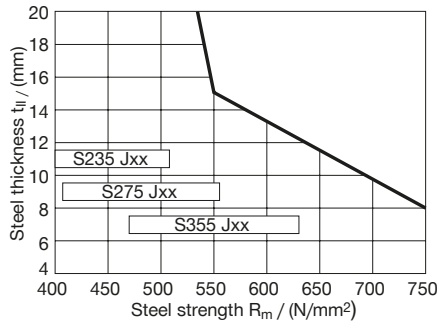
Edge distance for fastening to steel



- Fastener spacing max. 300 mm for proprietary light non-load-bearing partition walls with fire classification.
- Based on common practice, spacing needs to be adjusted based on specific load requirement and achieved embedment depth.
- All dimensions in mm.

For fastening to steel with X-S 14 B3 MX

Application limitation for fastening on steel



Performance data

Recommended resistance under tension and shear load

Designation	Tension load N_{rec}	Shear load V_{rec}
X-S 14 B3 MX	0.40 kN	0.40 kN

Recommended resistance under shear load for track fastening

Designation	Embedment depth h_{ET}	Shear load V_{rec}
X-P 17 B3 MX	≥ 11 mm	0.38 kN
X-P 20 B3 MX		

For fastening to concrete and sand-lime masonry with X-P B3, X-C B3

Recommended resistance under tension and shear load

Embedment depth h_{ET}	Tension load N_{rec}		Shear load V_{rec}	
	Soft/medium concrete	Tough concrete	Soft/medium concrete	Tough concrete
≥ 14 mm	0.10 kN	0.10 kN	0.10 kN	0.10 kN
≥ 18 mm	0.20 kN	-	0.20 kN	-
	Sand-lime masonry		Sand-lime masonry	
≥ 14 mm	0.10 kN		0.10 kN	
≥ 18 mm	0.20 kN		0.20 kN	
≥ 22 mm	0.30 kN		0.30 kN	



- Redundancy of fastening points is required.
- Minimum number of fastening points for safety relevant fastenings: ≥ 5 .
- Sheet metal failure is not considered in recommended loads and must be assessed separately.

Stick rate estimation

	Designation	Soft/medium 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.

System recommendation

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

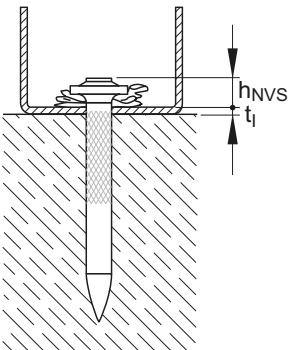
System recommendation for fastening nails

Designation	Battery-actuated tool		
	BX 3-ME	BX 3	BX 3-L
X-S 14 B3 MX	■	■	■
X-P 17 B3 MX	■	■	■
X-P 20 B3 MX	■	■	■
X-P 24 B3 MX	■	■	■
X-P 30 B3 P7	■	■	
X-P 36 B3 P7	■	■	
X-C 20 B3 MX	■	■	■
X-C 24 B3 MX	■	■	■
X-C 30 B3 MX		■	■
X-C 36 B3 MX			■

■ = recommended □ = possible

Quality assurance

Fastener stand-off for fastening to concrete and sand-lime masonry

	Designation	Fastener stand-off
		X-C_B3 MX X-P_B3 MX X-P_B3 P7

Fastener stand-off for fastening to concrete and sand-lime masonry

	Designation	Fastener stand-off
		h_{NVS}
	X-C_B3 MX X-P_B3 MX X-P_B3 P7	2-3 mm

Fastener stand-off for fastening deflection head to concrete

	Designation	Board thickness	Fastener stand-off
		t_l	h_{NVS}
	X-C 36 B3 MX	12.5 mm	≤ 12 mm
	X-P 36 B3 P7	15 mm	≤ 9 mm
		19 mm	≤ 5 mm

Fastener stand-off for fastening to steel

	Designation	Fastener stand-off
	X-S 14 B3 MX	h_{NVS} 2-9 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.

Fastener program

Item no. and description

Designation	Item no.	Description
X-S 14 B3 MX	2156392, 2156393	Fastening to steel
X-P 17 B3 MX	2156216, 2156219	Fastening to concrete
X-P 20 B3 MX	2156217, 2156390	
X-P 24 B3 MX	2156218, 2156391	
X-P 30 B3 P7	2105406	
X-P 36 B3 P7	2105407	
X-C 20 B3 MX	2123993	
X-C 24 B3 MX	2123994	
X-C 27 B3 MX	2224568	
X-C 30 B3 MX	2149988	
X-C 36 B3 MX	2149989	

B 3 system for fastening to steel and concrete

Dimension for fastening threaded studs to steel

Technical drawing	Designation	Shank length	
		L_s	Shank diameter d_s
	X-M6-7-14 B3 P7	14 mm	3.00 mm
	X-W6-12-14 B3 P7	14 mm	3.00 mm

Dimension for fastening threaded studs to concrete

Technical drawing	Designation	Shank length	
		L_s	Shank diameter d_s
	X-M6-7-24 B3 P7	24 mm	3.00 mm
	X-W6-12-20 B3 P7	24 mm	3.00 mm

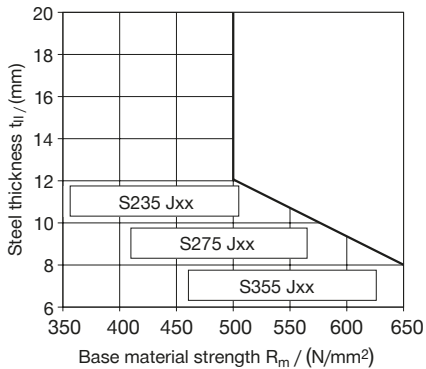
Application recommendation

Base material properties and fastener positioning in base material

	Base material	Steel
	Base material thickness t_{II}	≥ 6 mm

For fastening to steel with X-M6-7-14 B3 P7, X-W6-12-14 B3 P7

Application limitation for fastening on steel



Performance data

Recommended resistance under tension and shear load

Designation	Tension load N_{rec}	Shear load V_{rec}	Tightening torque T_{rec}	Base material
X-M6-7-24 B3 P7	0.05 kN	0.05 kN	3.00 Nm	Concrete, sand-lime masonry
X-W6-12-20 B3 P7				
X-M6-7-14 B3 P7	0.20 kN	0.20 kN	3.00 Nm	Steel
X-W6-12-14 B3 P7				

System recommendation



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

System recommendation for fastening threaded studs

Designation	Battery-actuated tool	
	BX 3-ME	BX 3-IF
X-M6-7-14 B3 P7	■	□
X-W6-12-14 B3 P7		
X-M6-7-24 B3 P7		
X-W6-12-20 B3 P7		

■ = recommended □ = possible

Quality assurance

Fastener stand-off for fastening to concrete and sand-lime masonry

	Designation	Fastener stand-off
	X-M6-7-24 B3 P7	7–11 mm
	X-W6-12-20 B3 P7	12–15 mm

Fastener stand-off for fastening to steel

	Designation	Fastener stand-off
	X-M6-7-14 B3 P7	h_{NVS} 7-11 mm
	X-W6-12-14 B3 P7	12-15 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.

Fastener program

Item no. and description

Designation	Item no.	Description
X-M6-7-14 B3 P7	2105408	Fastening to steel
X-W6-12-14 B3 P7	2105800	
X-M6-7-24 B3 P7	2105409	Fastening to concrete
X-W6-12-20 B3 P7	2105801	

BX 3 system for fastening elements

Fastening element examples

Holding systems for cables

X-EKB MX
Cable clamp



X-ECH
Cable holder with nail



X-ECH-FE
Metal cable holder



Holding systems for conduits

X-FB MX
P-clip



X-DFB MX
Butterfly conduit flip



X-EMTC MX
Metal cable holder



Holding systems for cables and conduits

X-ECT MX
Cable tie mount



X-EKS MX
Pipe clamp with nail

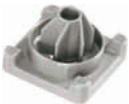


X-EKSC MX
Pipe clamp with nail



Holding systems for trunkings

X-ET MX
Cable trunking fastener



- Material specifications are described in the corresponding Product Data Sheet(s) for element(s).

Application recommendation

Spacing

Fastener spacing \leq 100 mm

Performance data

Maximum service load

Designation	Service load F_{\max}
X-ECT (FR) MX	0.040 kN
X-UCT MX	0.040 kN
X-EKS MX	0.011 kN
X-EKSC MX	0.032 kN
X-FB MX / X-DFB MX	0.020 kN
X-ECC MX	0.050 kN
X-EHS MX	0.080 kN
X-EKB (FR) 4 MX	0.090 kN
X-EKB (FR) 8 MX	0.014 kN
X-EKB (FR) 16 MX	0.018 kN
X-ECH MX	0.040 kN
X-ET MX	0.010 kN



- Recommended service load is determined by the serviceability of the plastic part.

System recommendation



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

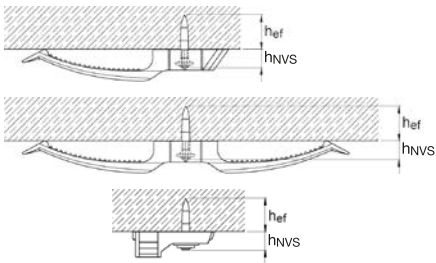
System recommendation for fastening elements

Designation	Battery-actuated tool		
	BX 3-ME	BX 3	BX 3-L
ME MX elements	■	□	□

■ = recommended □ = possible

Quality assurance

Fastener stand-off



Designation	Fastener stand-off	
	h_{NVS}	
	Concrete	Steel
X-EKB 4/8 MX	6-11 mm	6-9 mm
X-EKB 16 MX	6-11 mm	6-9 mm
X-ECT MX	6-11 mm	6-9 mm
X-UCT MX	6-11 mm	6-9 mm
X-ECH MX	6-11 mm	6-9 mm
X-EKS MX	6-11 mm	6-9 mm
X-EKSC MX	6-11 mm	6-9 mm
X-FB MX	7-11 mm	7-9 mm
X-DFB MX	7-11 mm	7-9 mm
X-ECC MX	7-11 mm	7-9 mm
X-EHS MX	7-11 mm	7-9 mm
X-ET MX	5-10 mm	5-9 mm



- Fastener stand-off h_{NVS} for X-ET MX is measured against the cable trunk.
- 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.

Fastener program

Item no. and description



- Item no. and description is provided in the corresponding Product Data Sheet(s) for element(s).