



BX3 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

BX 3 battery-actuated direct fastening tools



BX 3-ME (02)
BX 3-IF



BX 3 02
BX 3-L 02

Features and benefits

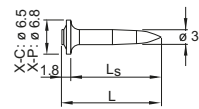
- Hilti's combustion-free direct fastening technology for driving nails into concrete, steel and some types of solid masonry
- High user comfort thanks to low levels of compression force, noise and recoil
- No disposal of (used) propellant cartridges or gas cans
- Hilti's 22V cordless tool battery platform

Fasteners and their compatibility

Nails

For fastening to concrete

- X-P 17/20/24 B3 MX
- X-P 30/36 B3 P7
- X-C 20/24/27/30 B3 MX

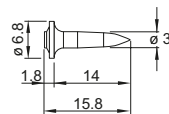


X-C 36 B3 MX



For fastening to steel

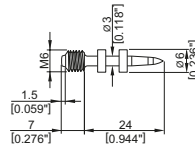
- X-S 14 B3 MX



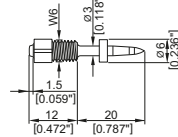
Threaded studs

For fastening to concrete

- X-M6-7-24 B3 P7

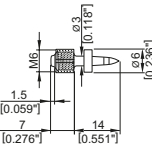


X-W6-12-20 B3 P7

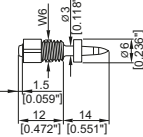


For fastening to steel

- X-M6-7-14 B3 P7



X-W6-12-14 B3 P7



| | BX 3-ME (02) | BX 3-IF | 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 27 B3 MX | no | no | 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 |

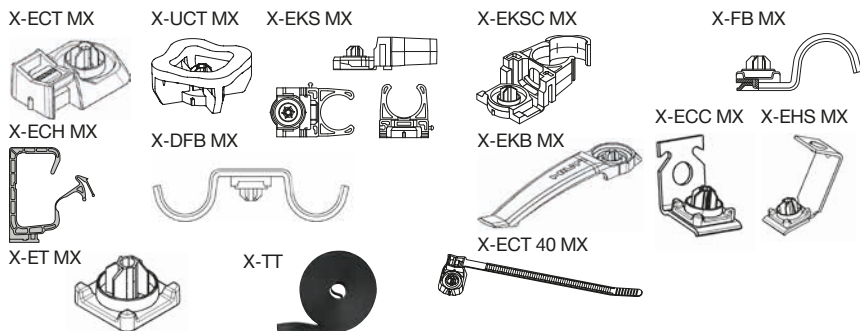
General information

Material specifications

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

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

Electrical elements to be used with nails - examples



General information

Material specifications

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

PA, halogen free, silicone free, light grey RAL 7035

X-EKB MX

PA, halogen free, light grey RAL 7035

X-ECT-FR MX

PBT, silicone free, flame retardant, stone grey RAL 7030

X-EKB-FR MX

PBT, silicone free, flame retardant, stone grey RAL 7030

X-UCT MX, X-ET MX

HDPE, halogen free, silicone free, light grey RAL 7035

X-TT

PET

X-FB MX, X-DFB MX

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

X-ECC MX, X-EHS MX

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



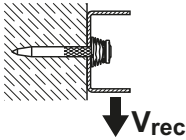
Fastening cables



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 [µm] |
|-----------------|-------------|--------------|--------------|--------------|----------------|--------------|
| X-P B3 P7/MX | 17-36 | Long conical | 3.0 | Carbon steel | 57.5 | Zinc, 2-10 |

- 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, BX 3-ME (02) and BX 3-IF
- X-P 30/36 B3 P7 to be used with BX 3-ME (02) and BX 3-IF

For **concrete** base material

| Nail types | Length [mm] | Tip | Shank Ø [mm] | Material | Hardness [HRC] | Coating [µm] |
|--------------|-------------|-----|--------------|--------------|----------------|--------------|
| X-C B3 MX | 20-30 36 | Cut | 3.0 2.75 | Carbon steel | 56.5 | Zinc, 5-13 |

- Standard 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 20/24/27/30 B3 MX to be used with BX 3 02
- X-C 20/24/27/30/36 B3 MX to be used with BX 3-L 02
- X-C 20/24 B3 MX to be used with BX 3-ME (02) and BX 3-IF

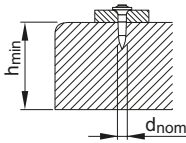
For **steel** base material

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

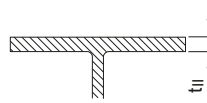
- X-S 14 B3 MX to be used with BX 3 02, BX 3-L 02, BX 3-ME (02) and BX 3-IF
- Please refer to next pages for application limits on steel base material

Application requirements

Thickness of base material

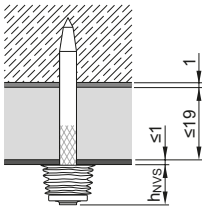


Concrete (for nails and threaded studs)
 $h_{min} = 60 \text{ mm}$
 $d_{nom} = 3.0 \text{ mm}$



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

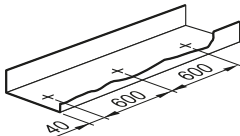
Thickness of fastened material



Wooden track: $t_1 \leq 27 \text{ mm}$ (conditions: head of the nail is countersunk flat to the surface)
 Metal track: $t_2 \leq 2 \text{ mm}$
 Deflection head: $t_{1,tot.} \leq 21 \text{ mm}$ (gypsum strip + metal track and sealant)

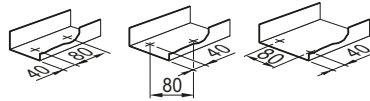
Spacing and edge distances (mm)

Max. spacing along track

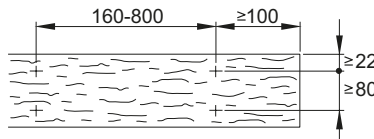
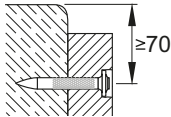


Fastener spacing max. 30 cm for proprietary light non-load-bearing partition walls with fire classification

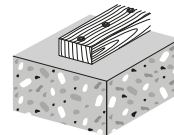
All track ends (cut-outs for doors), secure with 2 nails



Distance to edge of concrete / sand-lime masonry

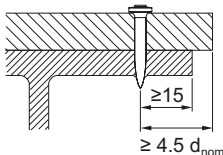


Spacing between nails when fastening wood to concrete



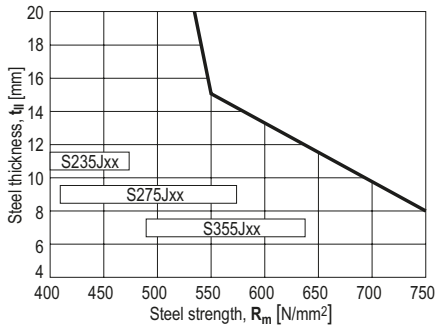
Based on common practice, spacing needs to be adjusted based on specific load requirement and achieved embedment depth.

Distance to edge of fastened material (steel base material)

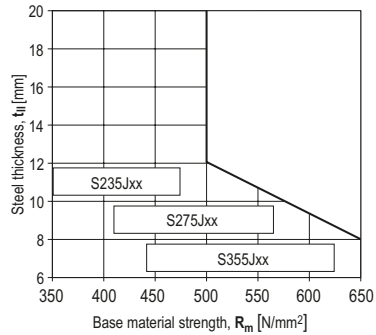


Application limits

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







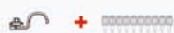







Nails

| 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 27 B3 MX | 2224568 | 27 | 3 | | |
| X-C 30 B3 MX | 2149988 | 30 | 3 | | |
| X-C 36 B3 MX | 2149989 | 36 | 2.75 | | |

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-ME (02) and BX 3-IF  | | | |
|---|---|-------------------------------------|-------------------------------------|---|
| | 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 selection

| | Nail Selector for BX 3 02 and 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 |
| Propellant-free | | | | |

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

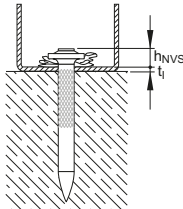
| | | | |
|--|------------------------------------|--|---|
| | X-FG B3-IF 02 # 2179275 | | ✓ |
| | X-FG B3-ME 02 # 2179276 | | |
| | X-FG B3-WH 02 # 2179277 | | ✓ |
| | X-FG B3-WHC 02 # 2179350 | | |
| | X-FG B3-PH 02 # 2179278 | | ✗ |
| | X-FG B3-PHD 02 # 2179279 | | |
| | X-FG B3-L 02 # 2179275 | | ✗ |
| | X-FG B3-L 02 # 2179275 | | |

| | | | |
|--|----------------------------------|--|---|
| | X-FG B3-ME # 2101258 | | ✓ |
| | X-WH B3 # 2101256 | | |
| | X-FG B3-FE # 2208570 | | ✓ |
| | X-FG B3-N # 2208489 | | |
| | X-FG B3-IF # 2116415 | | ✗ |
| | X-WHC B3 # 2149225 | | |
| | X-FG B3-L 02 # 2179275 | | ✗ |
| | X-FG B3-L 02 # 2179275 | | |

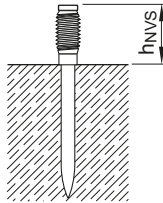
Fastening quality assurance

Fastening inspection

Nails and studs in concrete / sand-lime masonry

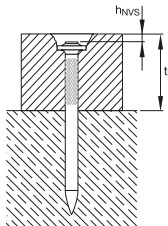


X-C_B3, X-P_B3:
 $h_{NVS} = 2-5 \text{ mm}$

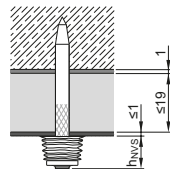


X-M6-7-24 B3 P7
X-W6-12-20 B3 P7

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

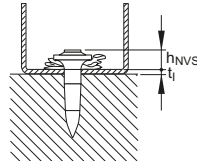


X-C_B3, X-P_B3:
 $h_{NVS} = 2-3 \text{ mm}$

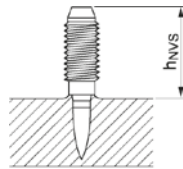


Deflection head
X-P 36 B3 P7, X-C 36 B3 MX
12.5 mm board: $h_{NVS} \leq 12 \text{ mm}$
15 mm board: $h_{NVS} \leq 9 \text{ mm}$
19 mm board: $h_{NVS} \leq 5 \text{ mm}$

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 |

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

Examples

