

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-22/0876
of 7 February 2023

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

X-X Fasteners for drywall track
& deflection head fastening to concrete

Product family
to which the construction product belongs

Power-actuated fastener in concrete and fixtures for
redundant non-structural applications

Manufacturer

Hilti AG
Feldkircherstraße 100
9494 Schaan
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

Hilti Werk 1
Hilti Werk 8

This European Technical Assessment
contains

11 pages including 3 annexes which form an integral part
of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 330083-04-0601, Edition 11/2022

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Specific Part**1 Technical description of the product**

The "X-X Fasteners for drywall track & deflection head fastening to concrete" are powder-actuated fasteners made of galvanised steel which are placed into the concrete without previous drill by use of a powder actuated tool Hilti DX 6 MX or Hilti DX 6 F8. They are anchored in the concrete by sintering and mechanical interlock.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the fastener is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the fastener of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment**3.1 Mechanical resistance and stability (BWR 1)**

Essential characteristic	Performance
Characteristic values of resistance and displacements	See Annex B2 and C1

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C2

3.3 Aspects of Durability

Essential characteristic	Performance
Durability	See Annex B1

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 330083-04-0601, the applicable European legal act is: 1997/463/EC (EU).

The system to be applied is: 2+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document


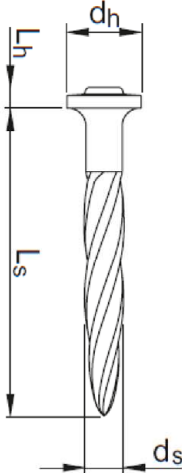

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 7 February 2023 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

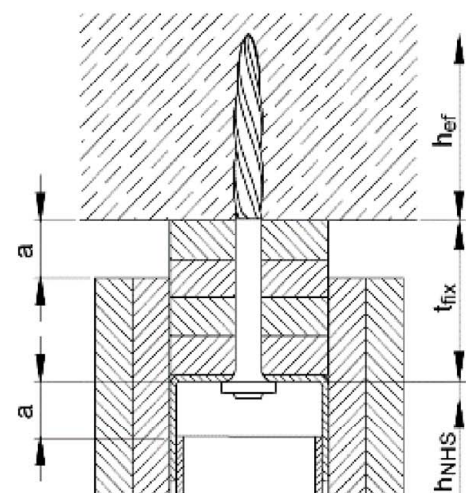
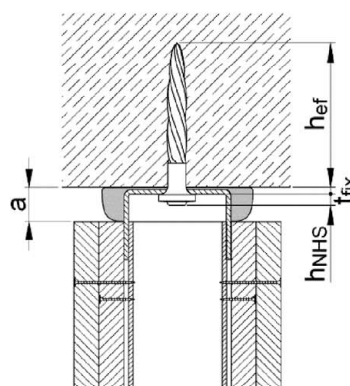
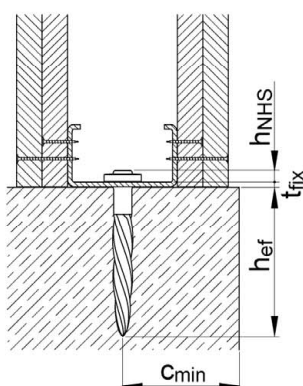
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Baderschneider

Power Actuated Fasteners for drywall track & gypsum deflection head fastening to concrete

X-X Fasteners	Dimensions
<p>Single fasteners X-X 22, 62 and 72 <u>P8</u></p> 	
<p>Collated Fasteners X-X 22, 62 and 72 <u>MX</u></p> 	

		X-X 22	X-X 62	X-X 72
Shaft length L_s	[mm]	22	62	72
Total length $L_s + L_h$	[mm]	24,4	64,4	74,4
Max shaft diameter d_s	[mm]	4,4	4,4	4,4
Head diameter d_h	[mm]	8,2	8,2	8,2
Material	[-]	Hardened carbon steel, Rockwell Hardness 58 HRC, zinc plating > 5 µm		

Installed configuration (application examples)



(Can be installed with or without sealant)

X-X Fasteners for drywall track & deflection head fastening to concrete

Product description, Product, Dimensions, Material and installed configuration

Annex A1

Specifications of Intended Use

- Fastening metal track with thicknesses of $0,6 \text{ mm} \leq t \leq 1 \text{ mm}$ and a tensile strength of $R_m \geq 270 \text{ N/mm}^2$, with or without fire sealants (e.g., Hilti CFS-TTS) or PE sealant ($< 5 \text{ mm}$).
- Fastening of gypsum deflection heads with 3 to 4 layers fire resistant gypsum strips DF (EN 520:2009) or GKF (DIN 18180:2014-09) with a nominal thickness of $12,5 \text{ mm}$ and a density $\geq 800 \text{ kg/m}^3$, as well as metal track with a thickness of $0,6 \text{ mm} \leq t$ (tensile strength $R_m \geq 270 \text{ N/mm}^2$) – with deflection allowance on the top of the wall of $a \leq 20 \text{ mm}$

Demand on Fasteners:

- Shear load on partitions resulting from weight, crowd pressure, wind, or eccentric vertical loads (e.g., cabinets).

Base Material:

- Reinforced and unreinforced normal weight concrete, classes C20/25 to C40/50 according to EN 206-1:2000.
- Cracked and non-cracked concrete
- For fastening in two-dimensional reinforced concrete members, i.e., ceiling / floor slabs

Environmental Service Conditions:

- Structures subject to dry internal conditions
- Minimum temperature: $-40 \text{ }^\circ\text{C}$
- Maximum temperature: $+80 \text{ }^\circ\text{C}$

Design:

- The fastener is to be used only for redundant non-structural application with following definition:
Number of fixing points $n_1 \geq 5$ (i.e., minimum of 5 fasteners per track)
Number of fasteners per fixing point $n_2 = 1$,
Design value of actions $V_{Ed,lim}$ per fixing point $n_3 \leq 2,0 \text{ kN}$
- Design: $H \cdot s \leq V_{Rk} / (\gamma_M \cdot \gamma_F)$

where

H	=	Horizontal shear force on the track per meter
s	=	fastener spacing in Meter
V_{Rk}	=	Characteristic shear resistance per Annex C1 (fire resistance see Annex C2)
γ_M	=	partial factor for resistance
γ_F	=	partial factor for demand or stress

Installation:

Installation to be executed by trained personnel. Damage to the concrete surface during installation shall be repaired in accordance with the state of the art, e.g., EN 1504-3:2005. In case of installation failures, an additional fastener shall be installed at a distance $\geq 150 \text{ mm}$, and $\geq 3 h_{ef}$ to the edge of the damages surface.

X-X Fasteners for drywall track & deflection head fastening to concrete

Intended Use: Specification

Annex B1

Table 3: Concrete strength classes and member dimensions

Fastener		X-X ... MX	X-X ... P8
Minimum concrete strength class	[-]	C20/25	
Maximum concrete strength class	[-]	C40/50	
Minimum member thickness h_{\min}	[mm]	80	

Table 4a: Installation parameters for track fastening (incl. Hilti TTS or PE Sealant)

Fastener	Embedment h_{ef} [mm]	Nail head stand off h_{NHS} [mm]
X-X 22 MX Or P8	21	≤ 6

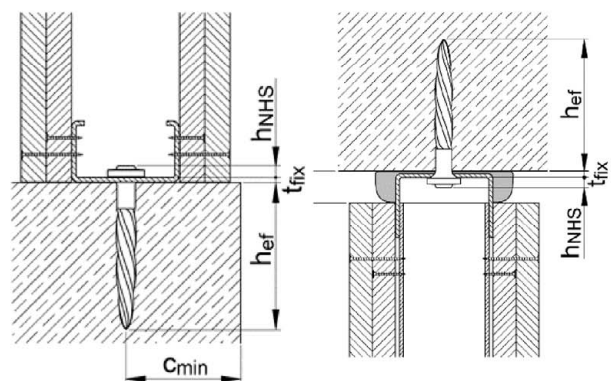
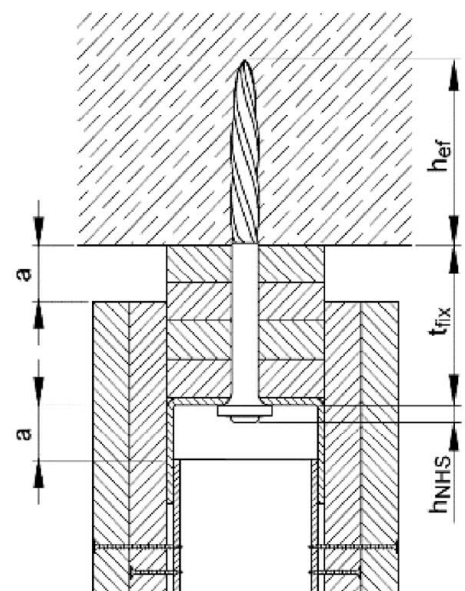


Table 4b: Installation parameters for gypsum deflection heads (3 to 4 gypsum layers)

Fastener	Embedment h_{ef} [mm]	Nail head stand off h_{NHS} [mm]
X-X 62 MX or P8 (3 layers x 12,5 mm)	23	≤ 6
X-X 72 MX or P8 (4 layers x 12,5 mm)	21	≤ 6



Nail length selection

The nail length shall be selected per table 4a or 4b, as applicable, and Hilti's installation instructions (Annex B4).

X-X Fasteners for drywall track & deflection head fastening to concrete

Intended Use: Concrete strength classes and installation parameters

Annex B2

Setting tools

Hilti DX 6 MX:
for collated fasteners X-X MX, fully automatic,
powder actuated



Hilti DX 6 F8:
for single fasteners X-X P8, fully automatic,
powder actuated



Collated fasteners
Hilti X-X 22, 62 and 72 MX



Single fasteners
Hilti X-X 22, 62 and 72 P8



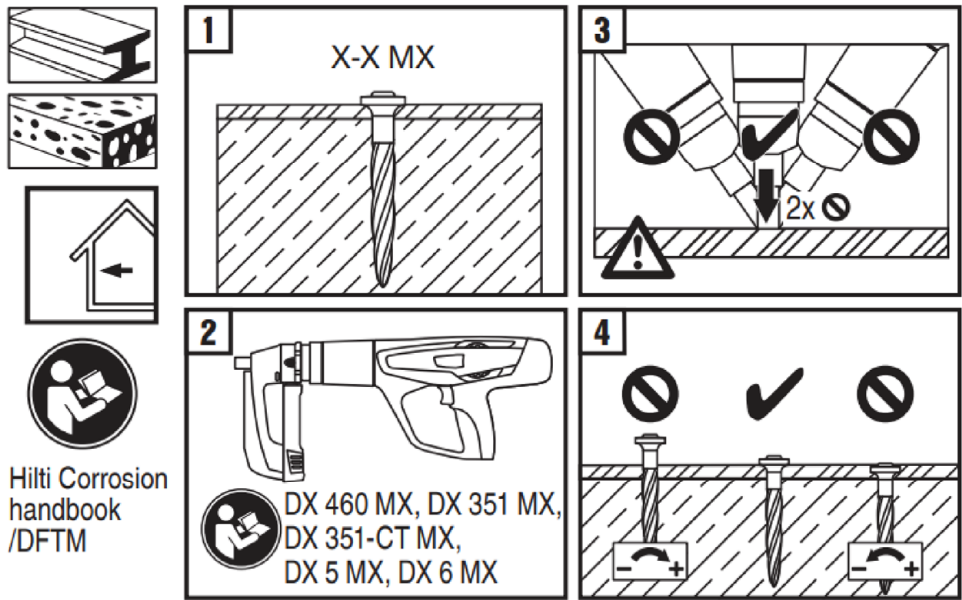
X-X Fasteners for drywall track & deflection head fastening to concrete

Intended Use: Setting tool

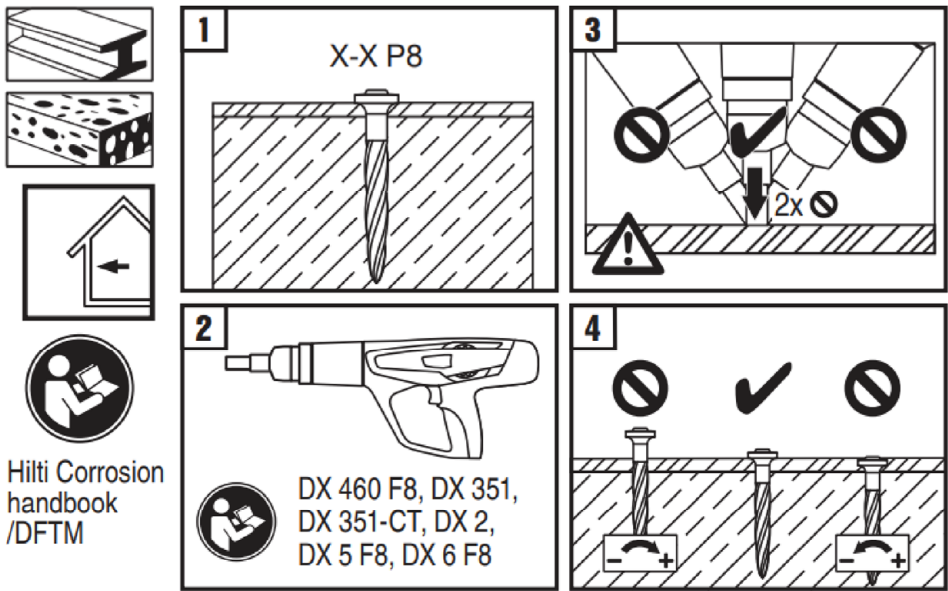
Annex B3

Installation Instruction

X-X MX



X-X-P8



Fastening quality control – Nail stand off

To check fastening quality, the nail head stand-off h_{NHS} is measured, (Table 4a and 4b, Annex B2).

X-X Fasteners for drywall track & deflection head fastening to concrete

Intended Use: Installation Instruction

Annex B4

Performance: Static resistance in cracked and non-cracked concrete

Table 5a: Track fastening (incl. Hilti TTS or PE sealant)

Fastener X-X 22 MX or P8		Track thickness t^1	
		0,6 mm	1,0 mm
Characteristic shear resistance V_{Rk} C20/25 – C40/50	[kN]	1,25	1,49
Partial factor $\gamma_M^{2)}$	[-]	1,5	
Partial factor $\gamma_F^{2)}$	[-]	1,4	
Minimum spacing s_{min}	[mm]	200	
Maximum spacing s_{max}	[mm]	600	
Minimum edge distance c_{min}	[mm]	150	
Minimum thickness of fixture t_{fix}	[mm]	0,6	
Maximum thickness of fixture t_{fix}	[mm]	1,0	

1) Intermediate values of track thicknesses can be linearly interpolated

2) In absence of national regulations

Table 5b: Gypsum deflection head (3 to 4 gypsum layers)

Fastener: Configuration:		X-X 62 MX or P8 3 gypsum layers (12,5 mm each)	X-X 72 MX or P8 4 gypsum layers (12,5 mm each)
Characteristic shear V_{Rk} C20/25 – C40/50	[kN]	0,94	0,85
Partial factor $\gamma_M^{1)}$	[-]	1,5	
Partial factor $\gamma_F^{1)}$	[-]	1,4	
Minimum spacing s_{min}	[mm]	200	
Maximum spacing s_{max}	[mm]	600	
Minimum edge distance c_{min}	[mm]	150	
Thickness of fixture t_{fix}	[mm]	38,1 (gypsum & track)	50,6 (gypsum & track)

1) In absence of national regulations

X-X Fasteners for drywall track & deflection head fastening to concrete

Performance: Characteristic resistance, spacing and edge distance, fixture thickness

Annex C1

Performance: Fire resistance in cracked and non-cracked concrete

Table 6a: Track fastening (incl. Hilti TTS or PE sealant)

Hilti X-X 22 MX / P8	Fire duration	Track thickness t ¹⁾	
		0,6 mm	1,0 mm
Characteristic Shear resistance V_{Rk} C20/25 – C40/50 [kN]	30 min	0,20	0,23
	60 min	0,16	0,19
	90 min	0,12	0,15
	120 min	0,05	0,11
Partial factor γ_M ²⁾ [-]		1,0	
Partial factor γ_F ²⁾ [-]		1,0	
Minimum spacing s_{min} [mm]		200	
Maximum spacing s_{max} [mm]		600	
Minimum edge distance c_{min} [mm]		150	

1) Intermediate values of track thicknesses can be linearly interpolated

2) In absence of national regulations

Table 6b: Gypsum deflection head (3 to 4 gypsum layers)

Hilti X-X 62 MX / P8 (3 gypsum layers) Hilti X-X 72 MX / P8 (4 gypsum layers)	Fire duration	Total thickness	
		Gypsum 3 x 12,5 mm Track 0,6 mm	Gypsum 4 x 12,5 mm Track 0,6 mm
Characteristic shear resistance V_{Rk} C20/25 – C40/50 [kN]	30 min	0,17	
	60 min	0,17	
	90 min	0,12	
Partial factor γ_M ¹⁾ [-]		1,0	
Partial factor γ_F ¹⁾ [-]		1,0	
Minimum spacing s_{min} [mm]		200	
Maximum spacing s_{max} [mm]		600	
Minimum edge distance c_{min} [mm]		150	

1) In absence of national regulations

X-X Fasteners for drywall track & deflection head fastening to concrete

Annex C2

Performance: Characteristic fire resistance, spacing and edge distance, fixture thickness