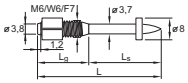
X-M6, X-W6, X-F7, X-M8, M10, W10 Threaded Studs for Concrete

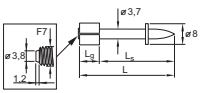
Product data

Dimensions

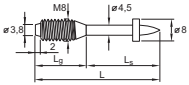
X-M6/W6/F7 ____ FP8



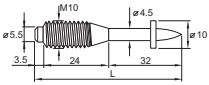
F7 ____ FS8



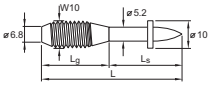
X-M8 ____ P8



M10-24-32 P10



W10 ____ P10



General information

Material specifications

Carbon steel shank:	HRC 53.5
Zinc coating:	5–13 µm

Fastening tools

DX 460, DX 351, DX 36, DX E72, DX 76, DX 76 PTR, DX 600 N

See fastener selection for more details.

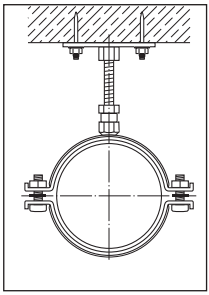
Approvals

ICC (USA):	**X-W6, W10**
UL:	**W10**

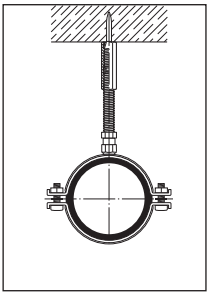
Note:
Technical data presented in these approvals and design guidelines reflect specific local conditions and may differ from those published in this handbook.

Applications

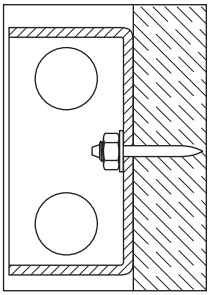
Examples



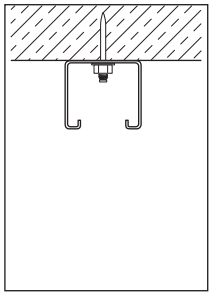
Plates for pipe rings



Hangings with threaded couplers



Electrical boxes



Miscellaneous attachments

Load data

Design data

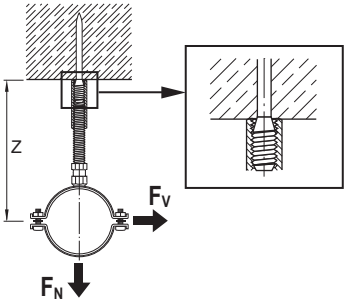
Recommended loads

Fastener designation	Shank diameter d_s [mm]	M_{rec} [Nm]
X-M6/W6, F7	3.7	5.0
X-M8, M10	4.5	9.0
W10	5.2	14.0

X-M6/W6, F7, X-M8, M10, W10

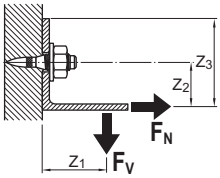
$N_{rec} = V_{rec}$ =	0.4 kN for $h_{ET} \geq 27$ mm
$N_{rec} = V_{rec}$ =	0.3 kN for $h_{ET} \geq 22$ mm
$N_{rec} = V_{rec}$ =	0.2 kN for $h_{ET} \geq 18$ mm

Arrangements to prevent moment on shank:
Coupler tight against concrete

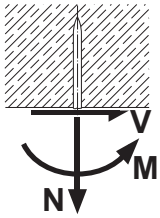


Non-symmetric arrangement

- Moment on fastened part
- Prying effect must be considered in determining loads acting on fastener



Conditions



- Minimum 5 fastenings per fastened unit (normal weight concrete)
- All visible failures must be replaced.
- With lightweight concrete base material and greater loading may be possible, please contact Hilti.
- Predominantly static loading.
- Observance of all application limitations and recommendations.
- The recommended loads in the table refer to the resistance of the individual fastening and may not be the same as the loads F_N and F_V acting on the fastened part.
  Note: If relevant, prying forces need to be considered in design, see example. Moment acting on fastener shank only in case of a gap between base and fastened material.

Test data

Important note: test data are for information only and cannot be used for design. These data are examples and do not represent the whole range of applications and load cases.
Design data for Hilti standard nails in concrete are based on a specific statistical evaluation method taking into consideration high variation coefficients. The evaluation procedure is described in the **Direct Fastening Principles and Technique** section of this manual.
For more detailed information please contact Hilti.

Fastener designation	Pull-out load (mean ultimate) $N_{u,m}$ [kN]	Embedment depth h_{ET} [mm]	Variation coefficient [%]	Concrete strength at 28 days f_{cc} [N/mm²]
X-M6-11-27 (DX 460)	4.37	26.3	42.8	24.9
	4.64	26.7	53.7	45.6
X-M8-15-27 (DX 460)	3.83	27.7	41.0	24.9
	4.00	26.8	57.8	45.6
W10-30-32 P10 (DX 600N)	8.18	33.2	28.6	45.6

Application requirements

Thickness of base material

Concrete

h_{min} = 80 mm (d_{nom} = 3.7 mm)

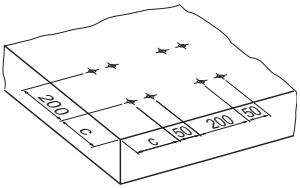
h_{min} = 100 mm (d_{nom} ≥ 4.5 mm)

Thickness of fastened material

M6:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 15 mm**
W6:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 33 mm**
F7:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 10 mm**
M8:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 15 mm**
M10:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 19 mm**
W10:	$t_I \leq L_g - t_{washer} - t_{nut} \cong$ **up to 25 mm**

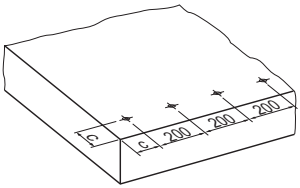
Spacing and edge distances (mm)

Pairs



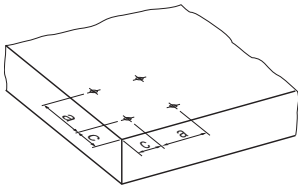
	Reinforced *	Non-reinforced
c	100	150

Row along edge



	Reinforced *	Non-reinforced
c	80	150

General (e.g. group of fasteners



	Reinforced *	Non-reinforced
c	80	150
a	80	100

* Minimum ∅ 6 reinforcing steel continuous along all edges and around all corners. Edge bars must be enclosed by stirrups.

Corrosion information

The intended use only comprises fastenings which are not directly exposed to external weather conditions or moist atmospheres. For further detailed information on corrosion see relevant chapter in **Direct Fastening Principles and Technique** section.

Fastener selection and system recommendation

Fastener selection

Required thread length

$L_g \geq t_I + t_{washer} + t_{nut}$ [mm]

System recommendation

Fasteners					Tool
Group [1]	Designation	Item no.	Standard threading[2] L_g [mm]	Standard shank lengths [2] L_S [mm]	Designation
M6	**X-M6-11-22FP8**	306076	11	22	**DX 460, DX 351, DX 36, DX E72**
	X-M6-11-27FP8	306077	11	27	**DX 460, DX 351, DX 36, DX E72**
	X-M6-20-22FP8	306078	20	22	**DX 460, DX 351, DX 36, DX E72**
	X-M6-20-27FP8	306079	20	27	**DX 460, DX 351, DX 36, DX E72**
	X-M6-8-17FP8	306080	8	17	**DX 460, DX 351, DX 36, DX E72**
	X-M6-8-22FP8	306081	8	22	**DX 460, DX 351, DX 36, DX E72**
	X-M6-8-27FP8	306082	8	27	**DX 460, DX 351, DX 36, DX E72**
	X-M6-11-17FP8	306489	11	17	**DX 460, DX 351, DX 36, DX E72**
W6	**X-W6-20-22FP8**	306073	20	22	**DX 460, DX 351, DX 36, DX E72**
	X-W6-20-27FP8	306074	20	27	**DX 460, DX 351, DX 36, DX E72**
	X-W6-38-27FP8	306075	38	27	**DX 460, DX 36, DX E72**
	X-W6-11-22FP8	306486	11	22	**DX 460, DX 351, DX 36, DX E72**
	X-W6-11-27FP8	306487	11	27	**DX 460, DX 351, DX 36, DX E72**
F7	**X-F7-7-22FS8**	306089	7	22	**DX 460, DX 351, DX 36, DX E72**
	X-F7-7-27FS8	306090	7	27	**DX 460, DX 351, DX 36, DX E72**
	X-F7-15-27FS8	306493	15	27	**DX 460, DX 351, DX 36, DX E72**
M8	**X-M8-15-27P8**	306092	15	27	**DX 460, DX 36, DX E72**
	X-M8-15-42P8	306094	15	42	**DX 460, DX 36, DX E72**
	X-M8-20-32P8	306096	20	32	**DX 460, DX 36, DX E72**
M10	**M10-24-32P10**	26413	24	32	**DX 76, DX 76 PTR**
W10	**W10-30-27P10**	26472	30	27	**DX 600 N**
	W10-30-32P10	26473	30	32	**DX 600 N**
	W10-30-42P10	26476	30	42	**DX 600 N**

[1]) Type threading: M = metric; W6, W10 = Whitworth 1/4"; 3/8"; F7 = French 7 mm
[2]) Standard threading and shank lengths. Other lengths and combinations available on special order.

Cartridge selection

Cartridge recommendation:

M6, W6, F7, M8:	**6.8/11M yellow or red cartridge**
M10:	**6.8/18M blue or red**
W10:	**6.8/18 yellow, red or black**

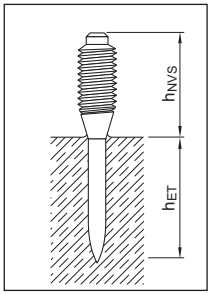
Tool energy adjustment by setting tests on site.

Fastening quality assurance

Fastening inspection

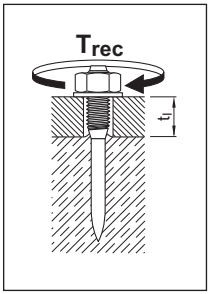
X-M6 / W6 / F7

Penetration depth



$h_{ET} = L_s \pm 2$

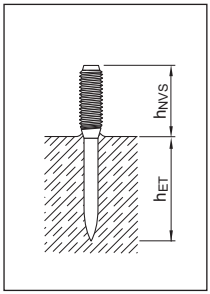
Tightening torque



$T_{rec} \leq 4$ Nm

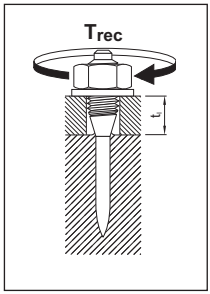
X-M8, M10, W10

Penetration depth



$h_{ET} = L_s \pm 2$

Tightening torque



$T_{rec} \leq 6$ Nm