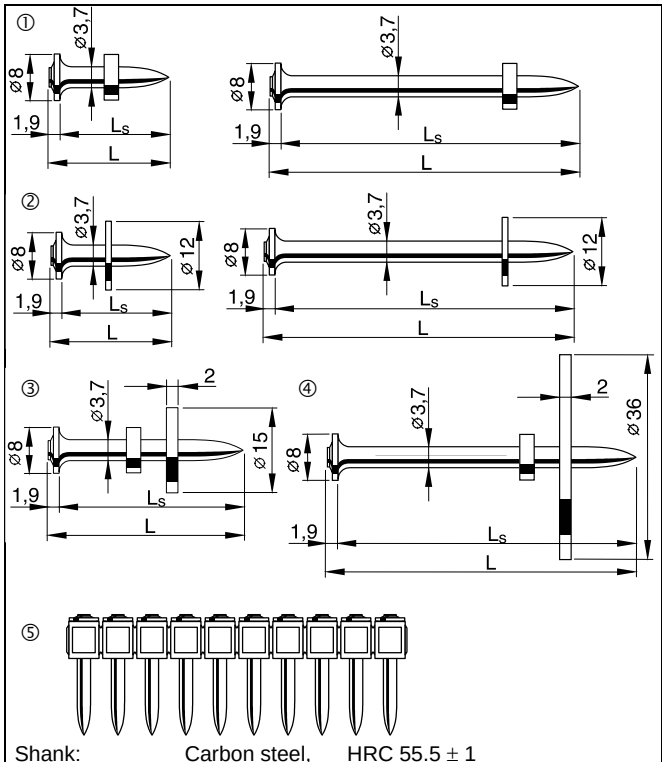
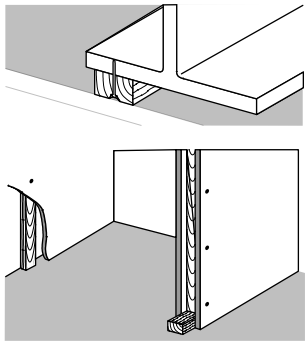
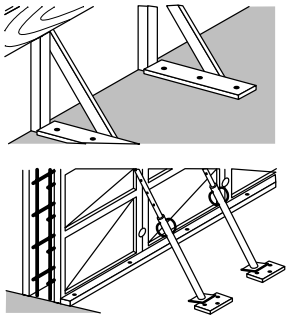
2.22 X-DNI General Purpose Nails for Concrete, Sandlime-Masonry and Steel



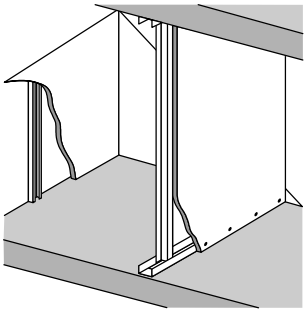
Shank: Carbon steel, HRC 55.5 ± 1
HRC 58 ± 1 (**X-DNI 82**,**97**,**117**)
Coating: Zn, 5 - 13 µm
Steel washers: Sheet steel, coating: Zn 10 - 20 µm
Plastic washers: Polyethylene

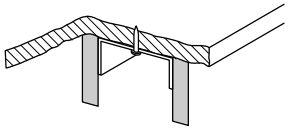


Sill plates, battens to conc., steel



Forming, barriers, temporary use





Drywall track to concrete, sandlime masonry and steel

Application Approvals and Governing Design Guidelines

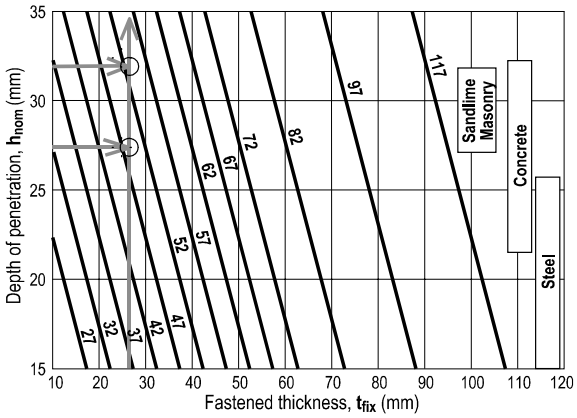
IBCO, Lloyd's, ABS

Technical data (design loads, application restrictions, etc.) presented in these approvals and design guidelines reflect specific local conditions and may differ from those published in this handbook. If the project is in a jurisdiction where the fastening is subject to the approval process or where a design guideline must be used, technical data in the approval or design guideline has precedence over data presented here. Approval copies are available from your Hilti technical advisory service.

Standard Program

	Designation	L_s	L	DX tools 1)
①	**X-DNI 19 P8**	19	20.9	**DX 460** (up to **X-DNI 72)**
	X-DNI 22 P8	22	23.9	**DX-A 40** (up to **X-DNI 47)**
	Sizes in 5 mm increments			**DX-A 41** (up to **X-DNI 72)**
	X-DNI 62 P8	62	63.9	**DX 36M** (up to **X-DNI 62)**
	X-DNI 72 P8	72	73.9	**DX-E 37** (up to **X-DNI 37)**
	X-DNI 82 P8	82	83.9	**DX-E 72** (up to **X-DNI 72)**
	X-DNI 97 P8	97	98.9	
	X-DNI 117 P8	117	118.9	
②	**X-DNI 22 S12**	19	20.9	**DX 460** (up to **X-DNI 72)**
	Sizes in 5 mm increments			**DX-A 40** (up to **X-DNI 47**)
	X-DNI 52 S12	52	53.9	**DX-A 41** (up to **X-DNI 72)**
	X-DNI 62 S12	62	63.9	
	X-DNI 72 S12	72	73.9	
	X-DNI 97 S12	97	98.9	
③	**X-DNI 27 P8S15**	27	28.9	**DX 460**, **DX-A 41**
	X-DNI 32 P8S15	32	33.9	**DX-A 40** (up to **X-DNI 47)**
④	**X-DNI 32 P8S36**	32	33.9	**DX 36M** (up to **X-DNI 62)**
	X-DNI 52 P8S36	52	53.9	**DX-E 37** (up to **X-DNI 37)**
	X-DNI 72 P8S36	52	53.9	**DX-E 72**
⑤	**X-DNI 19 MX**	19	20.9	**DX-A 40** (≤ **DNI 32__ MX)**
	X-DNI 22 MX	22	23.9	**DX-A 41**
	Sizes in 5 mm increments			**DX 36M** (≤ **DNI 62__ MX)**
	X-DNI 72 MX	72	73.9	

Selection of nail length for fastening to wood or soft material



* Nail heads 3mm countersunk

Example: Fasten 25 mm thick wooden battens to concrete
f_{cc} = 25 ; h_{nom} = 27 - 32

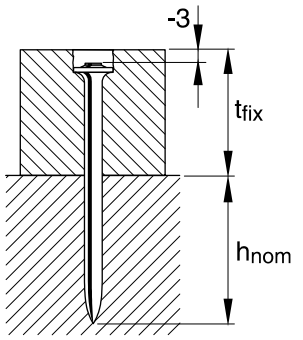
Q: Which nails will work?
A: **X-DNI 52 P8**

1) Nail length limits are for use without pre-driving into the wood. Hand-driving the nail into the wood and then bringing the DX tool into position over the nail head can extend the nail length range for any tool.

2.22 X-DNI General Purpose Nails for Concrete, Sandlime-Masonry and Steel

Wood to Concrete, Sandlime-Masonry and Steel

Concrete, Sandlime-Masonry



Lightweight concrete :

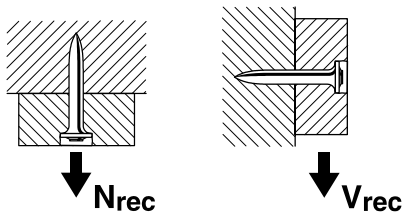
h_{nom} = 32 - 37 mm

Normal weight & sandlime concrete, h_{nom} according to f_{cc} :

f_{cc} (MPa)	15	25	37
h_{nom} - NWC	32	27	22
h_{nom} - sandl.	32	27	27

$L = h_{nom} + t_{fix} - 3$

Recommended working loads (predominently static)

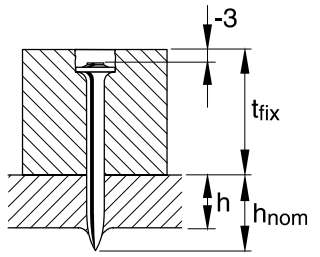


Concrete, Sandlime-Masonry: **400 N** Steel: **600 N**

Design conditions:

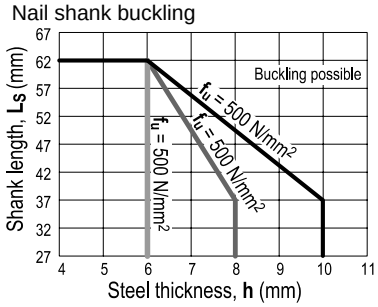
1a. Minimum 5 fastenings per fastened unit (normal weight concrete)
1b. Increase to 600 N possible if 8 or more fastenings in each fastened unit.
1c. All visible failures must be replaced.
2. Single point design possible with steel, sandlime-masonry or lightweight concrete base material.
3. Valid for concrete, sandlime f_{cc} < 40 mPa
4. Fastened material:
   - wood, minimum thickness = 24 mm
   - plywood, minimum thickness = 16 mm

Steel

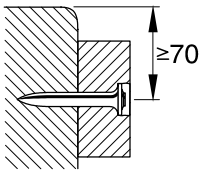


h_{nom} = 15 - 27 mm

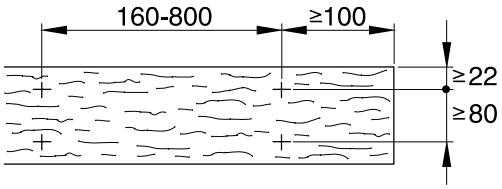
Nail shank buckling



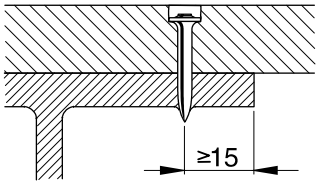
Distance to edge of concrete/ sandlime masonry:



Fastener spacings on wood:

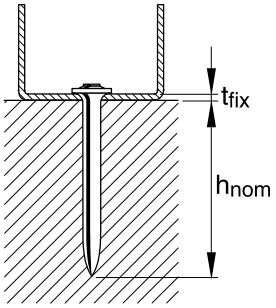


Distance to edge of steel:



Drywall Track to Concrete, Sandlime-Masonry and Steel

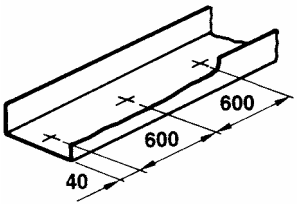
Concrete, Sandlime-Masonry



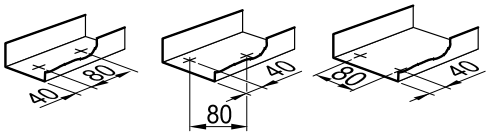
Select h_{nom} according to f_c :

f_c (mPa)	15	25	35
h_{nom} - NWC	32	27	22
h_{nom} - sandl.	32	27	27

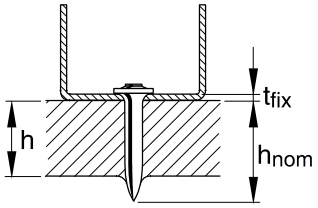
Spacing along track (per U.S. Gypsum Handbook)



At track ends (cut-outs for doors), secure with two nails



Steel



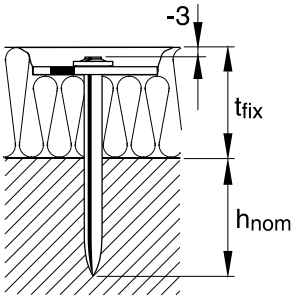
Use **X-DNI 19, 22,** or 27

Alternate nails:

- **X-EDNI 12** or **16**
- **X-EDNI 19** or **22** (if placeable)

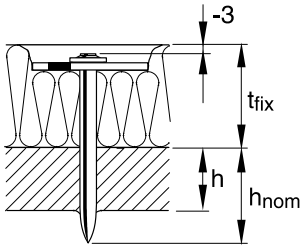
Soft Material to Concrete, Sandlime-Masonry and Steel

Concrete, Sandlime-Masonry



- Working loads depend on strength and thickness of material fastened. Do not use working loads in excess of those for wood.
- Depth of penetration and other conditions same as for fastening wood.
- Use R23 or R36 (ϕ4.5 hole) washer to control penetration and to increase pullover strength. Separately available from Hilti.

Steel



h_{nom} = 15 - 27 mm