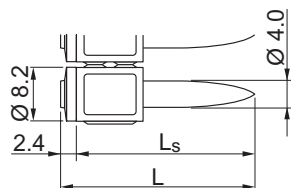


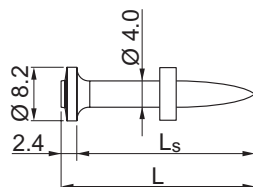
# X-P High Performance Nail for Fastening to Concrete and Wood to Steel applications

## Product data

X-P\_MX



X-P\_P8



## Features and Benefits

A **specially hardened fastener** with a **long conical tip** optimized for high load and stick rate for applications on **soft & tough** concrete and wood to steel.

## General information

### Recommended fastening tools

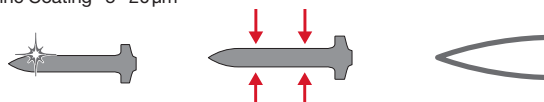
See **X-P fastener program** in the next pages and **Tools and equipment** chapter for more details

### Approvals and Certificates

IBMB (Germany), VHT (Germany), ICC-ESR 2269 (USA), COLA RR25675 (USA)

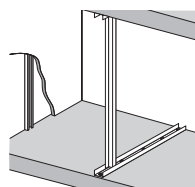
### Material Specifications

Carbon Steel 59 HRC    4mm shank diameter    Long Conical Tip  
Zinc Coating 5–20 µm

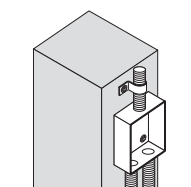


## Applications

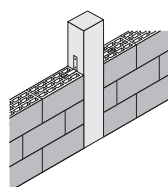
### Example



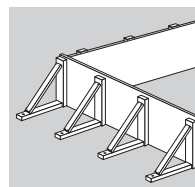
Drywall tracks



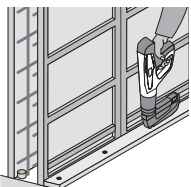
Mechanical, electrical



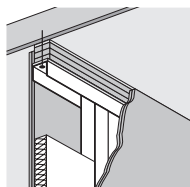
Wall ties



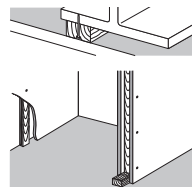
Formwork



System formwork



Deflection Head

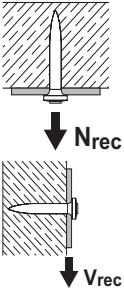


Wood Frame

The intended use for safety relevant and permanent applications only comprises fastenings which are not directly exposed to external weather conditions or moist atmospheres.

## Fastening sheet metal attachments to concrete

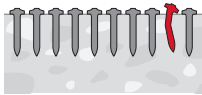
### Performance data



| Embedment<br>$h_{ET}$ [mm] | Recommended Loads [kN] |       |                 |       | Typical cartridge<br>colour selection<br>Type 6.8/11 |               |
|----------------------------|------------------------|-------|-----------------|-------|--|---------------|
|                            | Tension $N_{rec}$      |       | Shear $V_{rec}$ |       |  |               |
|                            | Concrete Toughness     |       |                 |       |  |               |
|                            | Soft                   | Tough | Soft            | Tough | Soft   | Tough         |
| $\geq 25$                  | 0.40                   | 0.20  | 0.80            | 0.40  | Red  | Red/<br>Black |
| $\geq 20$                  | 0.30                   | 0.15  | 0.60            | 0.30  |  |               |
| $\geq 18$                  | 0.20                   | 0.10  | 0.40            | 0.20  | Green/<br>Yellow                                     | Red           |

### 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  $f_{c,cube} = 45 \text{ N/mm}^2$ , Tough concrete up to  $f_{c,cube} = 65 \text{ N/mm}^2$ .
- Concrete with aggregate like granite or river rock or softer, and up to 16 mm diameter



| Stick rate estimation |                |
|-----------------------|----------------|
| Soft Concrete         | Tough Concrete |
| 95% – 99%             | 90% – 95%      |

- 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.

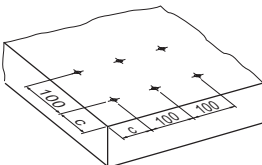
### Application requirements

#### Thickness of base material

Concrete:

$h_{min} = 80 \text{ mm}$

#### Edge distance and fastener spacing



Edge distance:

$c \geq 70 \text{ mm}$

Spacing:

$s \geq 100 \text{ mm}$

For standard light partition wall track:  $s \leq 60 \text{ cm}$

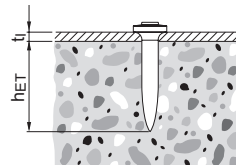
For track in proprietary fire rated light partition walls:  $s \leq 30 \text{ cm}$

#### Permissible sheet metal thickness

Sheet metal:

$t_l = 0.60 - 2.00 \text{ mm}$

#### Fastener shank length ( $L_s$ ) selection



Required nail shank length:

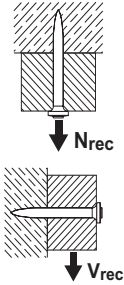
Recommendation:

$L_s = h_{ET} + t_l \text{ [mm]}$

$h_{ET} = 20 \text{ mm}$

## Fastening Wood to concrete (Wood Framing, Formwork)

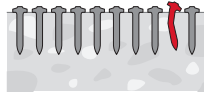
### Performance data



| Embedment<br>$h_{ET}$ [mm] | Recommended Loads [kN]<br>Tension $N_{rec}$ = Shear $V_{rec}$ |       | Typical cartridge<br>colour selection<br>Type 6.8/11 |           |
|----------------------------|---|-------|--|-----------|
|                            | Concrete Toughness  |       |  |           |
|                            | Soft  | Tough | Soft   | Tough     |
| $\geq 25$                  | 0.40  | 0.10  | Red  | Red/Black |
| $\geq 20$                  | 0.30  | -     |  | -         |
| $\geq 18$                  | 0.20  | -     | Green/<br>Yellow                                     | -         |
| $\geq 14$                  | 0.10  | -     |  | -         |

### Conditions:

- For safety relevant fastenings sufficient redundancy of the entire system is required:  
Minimum of 5 nails per fastened wood member. All visible setting failures must be replaced.
- Wood failure is not considered in recommended loads and must be assessed separately
- Soft concrete up to  $f_{c,cube} = 45 \text{ N/mm}^2$ , Tough concrete up to  $f_{c,cube} = 65 \text{ N/mm}^2$ .
- Concrete with aggregate like granite or river rock or softer, and up to 16 mm diameter
- To limit nail head penetration into wood or to increase pull-over load, use washers



| Stick rate estimation |   |
|-----------------------|---|
| Soft Concrete         | Tough Concrete<br>(temporary fastenings only) |
| 84% – 92%             | 80% – 90%                                     |

- 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.

### Application requirements

#### Thickness of base material

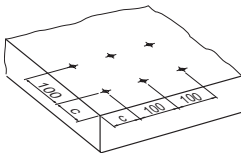
$h_{min} = 80 \text{ mm}$

#### Permissible wood thickness

On soft concrete:  $t_1 = 15 - 50 \text{ mm}$

On tough concrete:  $t_1 = 15 - 40 \text{ mm}$

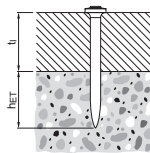
#### Edge distance and fastener spacing



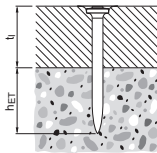
Edge distance:  
Spacing:

$c \geq 70 \text{ mm}$   
 $s \geq 100 \text{ mm}$

#### Fastener shank length ( $L_s$ ) selection



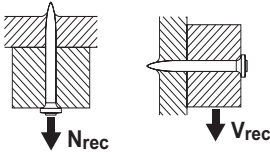
$L_s = h_{ET} + t_1 \text{ [mm]}$



In case of flush fastenings:  
 $L_s = h_{ET} + t_1 - 3 \text{ [mm]}$

## Fastening wood to steel base material

### Recommended loads



| Base steel thickness | Recommended loads [kN] |                 | Typical cartridge colour selection<br>Type 6.8/11 |
|----------------------|------------------------|-----------------|---|
|                      | Tension $N_{rec}$      | Shear $V_{rec}$ |   |
| 10 mm                | 0.4                    | 0.6             | Red / Black                                       |
| 8 mm                 |                        |                 | Red   |
| 6 mm                 |                        |                 | Yellow / Red                                      |
| 4 mm                 |                        |                 | Green / Yellow                                    |

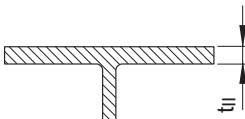
### Conditions:

- For safety-relevant fastenings sufficient redundancy of the entire system is required.
- The recommended loads above are conservatively controlled by wood capacity determined in accordance with EN 1995. For a more detailed design of the wood member, EN 1995 must be considered.
- Observe nail edge distance and spacing in wood required by recognized standards (e.g. EN 1995)
- To limit nail head penetration into wood or to increase pull-over load, use washers.

### Application requirements

#### Thickness of base material

Concrete:



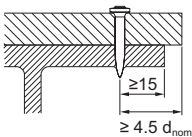
$$10 \text{ mm} \geq t_{II} \geq 4 \text{ mm}$$

#### Thickness of fastened material

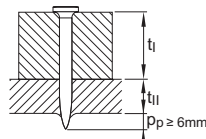
wood:

$$t_I = 15 - 50 \text{ mm}$$

### Edge distance

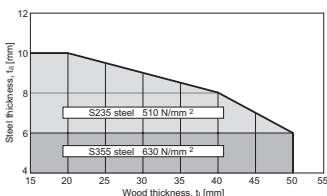


### Fastener shank length ( $L_S$ ) selection



### Application limits

For X-P 22 P8 to X-P 62 P8



$p_p$  = penetration of nail point through base steel

$$\text{Nail shank length } L_S \sim t_I + t_{II} + 6 \text{ mm}$$

For nail installation flush with wood surface:

$$\text{Nail shank length } L_S \sim t_I + t_{II} + 3 \text{ mm}$$

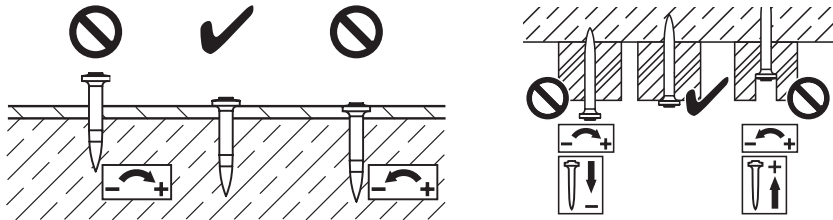
### Corrosion information

Zinc-coated fasteners are not suitable for long-term service outdoors or in otherwise corrosive environments.

The use of certain wood species like Oak and Douglas Fir, as well as some wood treatments can require the use of stainless steel fasteners, independent of environmental conditions. The use of carbon steel fasteners is then not permitted. Please consider relevant local regulations.

For further detailed information on corrosion see chapter **Direct Fastening Principles and Technique**.

### Fastening quality assurance



*These are abbreviated instructions which may vary by application.*

**ALWAYS** review / follow the instructions accompanying the product.

### Fastener selection and system recommendation

#### Fastener program

| Fastener  | Item No. | L <sub>S</sub><br>[mm] | DX 460 MX | DX 460 F8 | DX 5 MX | DX 5 F8 | DX 2 | DX 351 MX | DX 351 P8 | DX 462 F8 | Key applications                             |
|-----------|----------|------------------------|-----------|-----------|---------|---------|------|-----------|-----------|-----------|--|
| X-P 22 MX | 2150380  | 22                     | ■         |           | ■       |         |      | ■         |           |           | Track or Wall Tie to concrete                |
| X-P 27 MX | 2150381  | 27                     | ■         |           | ■       |         |      | ■         |           |           | Track or Wall Tie to concrete                |
| X-P 34 MX | 2150382  | 34                     | ■         |           | ■       |         |      |           |           |           | Track or Wall Tie to concrete                |
| X-P 40 MX | 2150383  | 40                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete & steel,<br>Deflection Head |
| X-P 47 MX | 2173900  | 47                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete & steel,<br>Deflection Head |
| X-P 52 MX | 2173901  | 52                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete & steel,<br>Deflection Head |
| X-P 57 MX | 2173902  | 57                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete & steel,<br>Deflection Head |

■ = Recommended

■ = Feasible

| Fastener  | Item No. | L <sub>s</sub><br>[mm] | DX 460 MX | DX 460 F8 | DX 5 MX | DX 5 F8 | DX 2 | DX 351 MX | DX 351 P8 | DX 462 F8 | Key applications                             |
|-----------|----------|------------------------|-----------|-----------|---------|---------|------|-----------|-----------|-----------|--|
| X-P 62 MX | 2173903  | 62                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete & steel,<br>Deflection Head |
| X-P 72 MX | 2173904  | 72                     | ■         |           | ■       |         |      |           |           |           | Wood to concrete,<br>Deflection Head         |
| X-P 22 P8 | 2150366  | 22                     |           | ■         |         | ■       | ■    |           | ■         | ■         | Track or Wall Tie to concrete                |
| X-P 27 P8 | 2150367  | 27                     |           | ■         |         | ■       | ■    |           | ■         | ■         | Track or Wall Tie to concrete                |
| X-P 34 P8 | 2150368  | 34                     |           | ■         |         | ■       | ■    |           | ■         | ■         | Track or Wall Tie to concrete                |
| X-P 40 P8 | 2150369  | 40                     |           | ■         |         | ■       | ■    |           | ■         | ■         | Wood to concrete & steel,<br>Deflection Head |
| X-P 47 P8 | 2173875  | 47                     |           | ■         |         | ■       | ■    |           | ■         | ■         | Wood to concrete & steel,<br>Deflection Head |
| X-P 52 P8 | 2173876  | 52                     |           | ■         |         | ■       | ■    |           |           | ■         | Wood to concrete & steel,<br>Deflection Head |
| X-P 57 P8 | 2173877  | 57                     |           | ■         |         | ■       | ■    |           |           | ■         | Wood to concrete & steel,<br>Deflection Head |
| X-P 62 P8 | 2173878  | 62                     |           | ■         |         | ■       | ■    |           |           |           | Wood to concrete & steel,<br>Deflection Head |
| X-P 72 P8 | 2173879  | 72                     |           | ■         |         | ■       | ■    |           |           |           | Wood to concrete,<br>Deflection Head         |

■ = Recommended

■ = Feasible