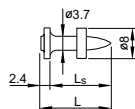


# X-CR Stainless Steel Nails for Fastening to Steel

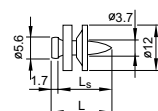
## Product data

### Dimensions

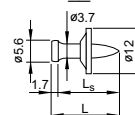
X-CR \_\_ P8



X-CR 14 D12



X-CR \_\_ S12



### General information

#### Material specifications

Nail shank: CR-500 (CrNiMo alloy)

 $f_u \geq 1800 \text{ N/mm}^2$ 

Steel washers: X2CrNiMo 18143

Plastic washers: polyethylene

#### Recommended fastening tools

DX 460, DX 450

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

#### Approvals

DIBt (Germany):

X-CR 14 P8  
fastening of glass facades  
with DX 450 (125%)

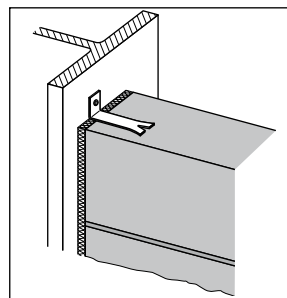
ABS, LR, IBMB:

all types

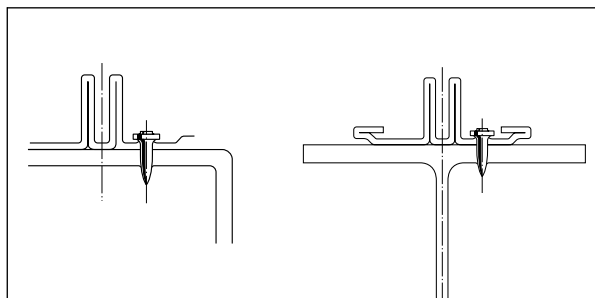


## Applications (for fastenings exposed to weather or other corrosive conditions)

### Examples



Wall ties



Fastening of glass facades

## Load data

### Recommended loads

#### Steel sheet fastening

Carbon steel sheet,  $f_u \geq 370 \text{ N/mm}^2$ 

$t_f$ [mm]	X-CR P8		X-CR D12/S12	
	$N_{rec}$ [kN]	$V_{rec}$ [kN]	$N_{rec}$ [kN]	$V_{rec}$ [kN]
0.75	1.0	1.1	1.4	1.1
1.00	1.2	1.4	1.6	1.4
1.25	1.5	1.7	1.8	1.7
2.00	2.2	2.0	2.2	2.0

Aluminium sheet,  $f_u \geq 210 \text{ N/mm}^2$ 

$t_f$ [mm]	X-CR P8		X-CR D12/S12	
	$N_{rec}$ [kN]	$V_{rec}$ [kN]	$N_{rec}$ [kN]	$V_{rec}$ [kN]
0.8	0.4	0.4	0.6	0.4
1.0	0.6	0.6	0.8	0.6
1.2	0.8	0.9	1.1	0.9
1.5	1.1	1.4	1.6	1.4
2.0	1.6	1.7	1.9	1.7

- Recommended working loads valid for fastened materials as shown above.
- For intermediate sheet thicknesses, use recommended load for next smaller thickness.
- For stainless steel sheet, use same loads as for carbon steel sheet.
- Recommended loads include an overall safety factor applied to the characteristic strength.  
Static test:  $N_{rec} = N_{test,k} / 3.0$   $V_{rec} = V_{test,k} / 3.0$
- These recommended loads are appropriate for Eurocode 1 (or similar) wind loading designs.

#### Other applications\*

X-CR P8 / X-CR 14 D12 / X-CR S12

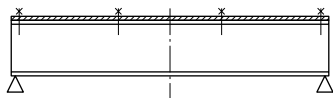
$N_{rec}$ [kN]	$V_{rec}$ [kN]	$M_{rec}$ [Nm]
1.6	2.0	3.8

\* Fastened parts: thicker steel components (clips, brackets, etc.)

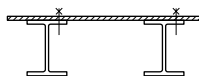
- Failure of fastened material is not considered in  $N_{rec}$  and  $V_{rec}$ .
- Loads valid for predominantly static loading.

### Forces of constraint

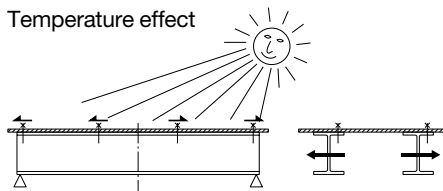
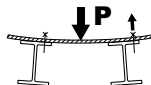
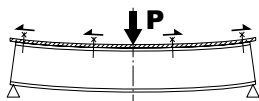
When fastening large pieces of steel or aluminium, the possibility of shear loadings from forces of constraint should be considered in the fastening design. Either allow for movement or avoid exceeding  $V_{rec}$ !



Deflection due to primary loading



Temperature effect



## Application requirements

### Thickness of base material

Using **DX 450** tool:  $t_{II} \geq 5.0 \text{ mm}$  <sup>1)</sup>

Using **DX 460** tool:  $t_{II} \geq 6.0 \text{ mm}$

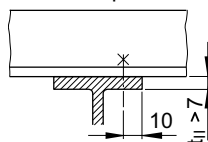
<sup>1)</sup>  $t_{II} \geq 4 \text{ mm}$  possible for specific types of hollow sections

### Thickness of fastened material

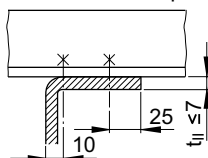
$t_I \leq 12.0 \text{ mm}$  (details see fastener selection)

### Spacing and edge distances (mm)

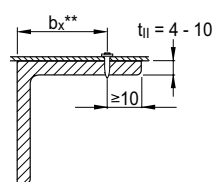
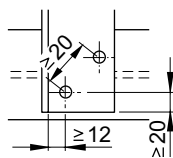
Rolled shapes



Cold formed shapes



Fastened material



\*\* max. allowable  $b_x \leq 8 \times t_{II}$  (however, jobsite trials advisable)

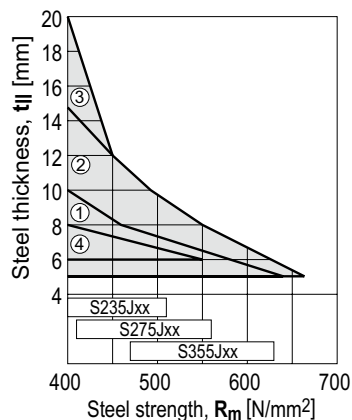
### Corrosion information

For fastenings exposed to weather or other corrosive conditions. Not for use in highly corrosive surroundings like swimming pools or highway tunnels.

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

### Application limits

#### DX 450, DX 460



① **X-CR16** ( $t_I \leq 3 \text{ mm}$ ) with DX 450 tool

② **X-CR14** ( $t_I \leq 2 \text{ mm}$ ) with DX 450 tool

③ **X-CR14** ( $t_I \leq 1 \text{ mm}$ ) with DX 450 tool

④ **X-CR14** ( $t_I \leq 1 \text{ mm}$ ) with DX 460 tool

**DX 450:** Steel thickness  $t_{II} \geq 5 \text{ mm}$

**DX 460:** Steel thickness  $t_{II} \geq 6 \text{ mm}$

## Fastener program

## Fastening of steel sheets

Fixed material thickness  $t_f$  [mm]

$\leq 1$	2	3	Fastener Designation	Item no.	$L_s$ [mm]	$h_{ET}$ [mm]	Tool
■	■		<b>X-CR 14 P8</b>	306701	14	$\geq 9$	<b>DX 450, DX 460</b>
		■	<b>X-CR 16 P8</b>	247356	16	$\geq 9$	<b>DX 450, DX 460</b>
■			<b>X-CR 14 D12</b>	244601	14	$\geq 9$	<b>DX 450</b>
	■	■	<b>X-CR 16 S12</b>	298855	16	$\geq 9$	<b>DX 450</b>

## Fastening of wood or soft material

Fixed material thickness  $t_f$  [mm]

$\leq 4$	5	6	8	9	11	Fastener Designation	Item no.	$L_s$ [mm]	$h_{ET}$ [mm]	Tool
	■	■				<b>X-CR 18 P8</b>	247357	18	$\geq 9$	<b>DX 450, DX 460</b>
			■	■		<b>X-CR 21 P8</b>	247358	21	$\geq 9$	<b>DX 450, DX 460</b>
■	■					<b>X-CR 18 S12</b>	298856	18	$\geq 9$	<b>DX 450</b>
		■	■			<b>X-CR 21 S12</b>	298857	21	$\geq 9$	<b>DX 450</b>
				■	■	<b>X-CR 24 S12</b>	298858	24	$\geq 9$	<b>DX 450</b>

■ = recommended thickness

 $L_s = h_{ET} + t_f$  for X-CR \_\_P8 $L_s = h_{ET} + t_f + 1$  for X-CR \_\_D12/S12

## Cartridge recommendation

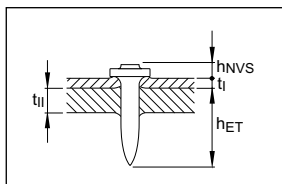
DX 460 **6.8/11M red or black cartridge**DX 450 **6.8/11M yellow cartridge** ( $t_{fl} \geq 5-6$  mm)**6.8/11M red cartridge** ( $t_{fl} > 6$  mm)

Tool energy adjustment by setting tests on site.

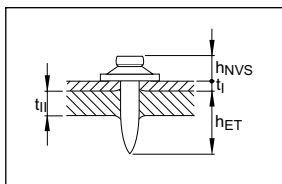
## Fastening quality assurance

## Fastening inspection

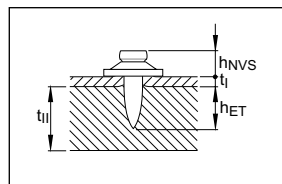
## X-CR \_\_ P8

 $h_{NVS} = 3.0-4.5$  mm

## X-CR 14 D12

 $h_{NVS} = 4-5$  mm

## X-CR \_\_ S12

 $h_{NVS} = 4-5$  mm