X10

CROSS-SHAPED POST BASE

S235 HOT DIP

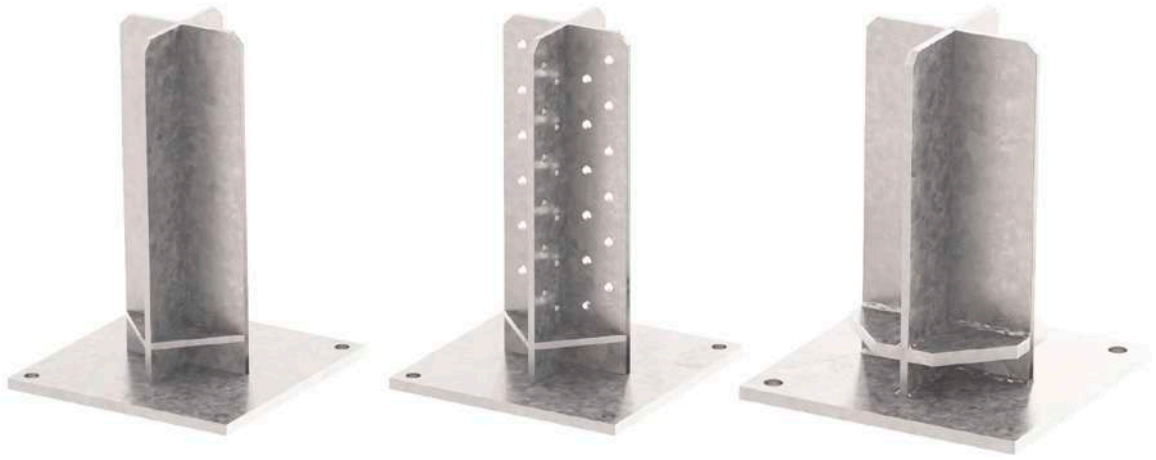
VIDEO

CE ETA 10/0422

TWO VERSIONS
Without holes for use with self drilling dowels, smooth dowels or bolts; with holes, for use with epoxy adhesive.

CONCEALED JOINT
Totally concealed installation. Different strength levels depending on the fastening configuration selected.

FIXED-END
Moment-resisting joint for fixed-end constraints. Values of the characteristic moment certified in both directions.



CHARACTERISTICS

FOCUS	concealed joints
COLUMNS	from 120 x 120 mm to 240 x 240 mm
HEIGHT	adjustable from 50 to 200 mm
FASTENERS	SBD, STA, XEPOX, VIN-FIX PRO

VIDEO
Scan the QR Code and watch the video on our YouTube channel

MATERIAL
Hot dip bright zinc plated carbon steel.

FIELDS OF USE
Moment resisting joints for outdoor use. Suitable for outdoor use (service classes 1, 2 and 3)
- solid timber and glulam
- CLT, LVL

FREE STRUCTURES

The base constraint can absorb horizontal loads allowing to realize pergolas or gazebos which do not require bracings and are open on all sides.

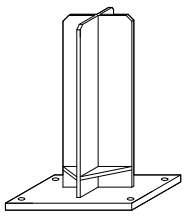
XEPOX

The cross shaped configuration and the fastener disposition are designed to guarantee a moment-resisting capacity, creating a semi-rigid constraint at the base.

CODES AND DIMENSIONS

XS10 - fastening with dowels or bolts

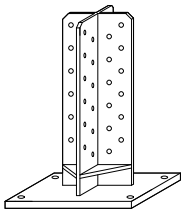
CODE	bottom plate [mm]	lower holes [n. x mm]	H [mm]	knife plate thickness [mm]	cross shaped blades	pcs
XS10120	220 x 220 x 10	4 x Ø13	310	6	smooth	1
XS10160	260 x 260 x 12	4 x Ø17	312	8	smooth	1



XR10 - fastening with resin for wood

CODE	bottom plate [mm]	lower holes [n. x mm]	H [mm]	knife plate thickness [mm]	cross shaped blades	pcs
XR10120	220 x 220 x 10	4 x Ø13	310	6	holes Ø8	1

Not holding CE marking.



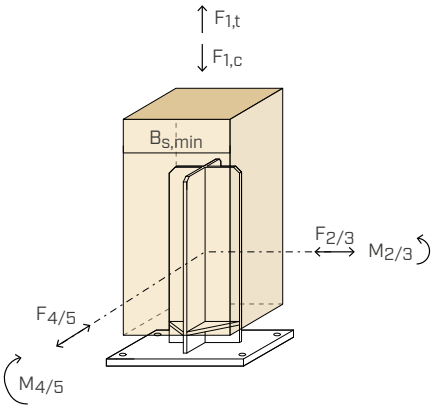
MATERIAL AND DURABILITY

TYP X: S235 hot dip bright zinc plated carbon steel.
To be used in service classes 1, 2 and 3 (EN 1995-1-1).

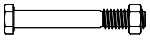
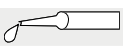
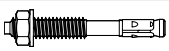
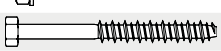
FIELD OF USE

- Solid timber or glulam columns

EXTERNAL LOADS

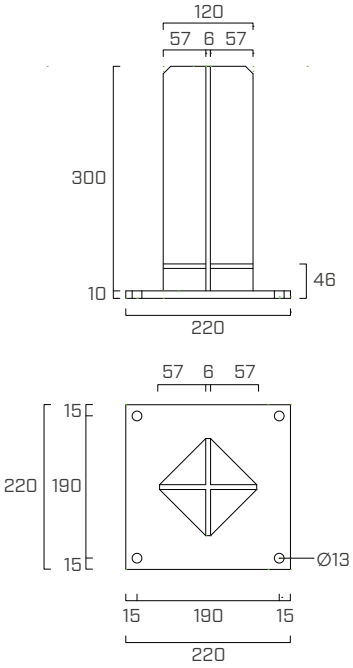


ADDITIONAL PRODUCTS - FASTENING

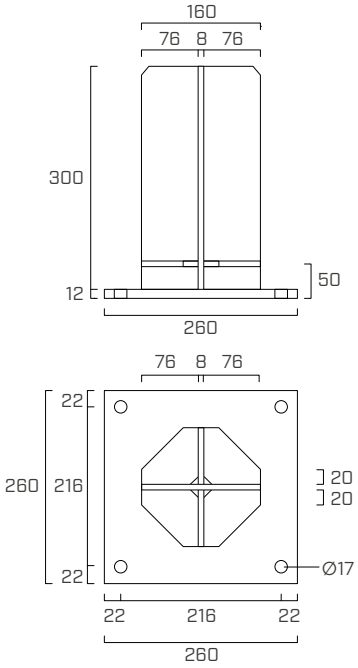
type	description		d [mm]	support	page
SBD	self-drilling dowel		7,5		48
STA	smooth dowel		12		54
KOS	bolt		M12		526
XEPOX F	epoxy adhesive		-		146
AB1	metal anchor		12-16		494
SKR	screw anchor		12-16		488
VIN-FIX PRO	chemical anchor		M12-M16		511
EPO-FIX PLUS	chemical anchor		M12-M16		517

GEOMETRY

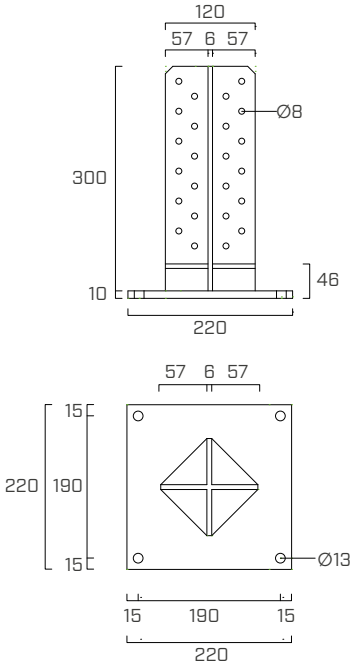
XS10120



XS10160



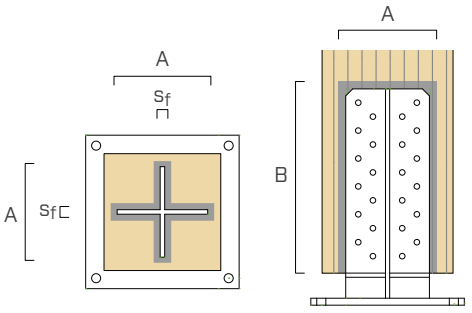
XR10120



INSTALLATION

ESTIMATE OF THE REQUIRED AMOUNT OF XEPOX RESIN - XR10

Examples of d imensions of the grooving	**grooving thickness s_f**	**[mm]**	**10**	**12**
	A horizontal grooving	[mm]	140	140
	B horizontal grooving	[mm]	280	280
	V grooving	[mm^3]	756000	900480
	V plate holes	[mm^3]	14476	
	V plate	[mm^3]	353780	
	Δ V	[mm^3]	402220	546700
	waste coefficient		1,4	
	amount of resin required	[mm^3]	563109	765381
		[litre]	**0,60**	**0,80**

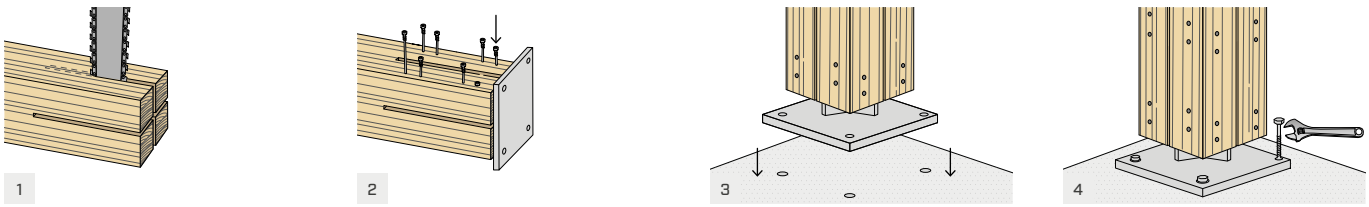


The evaluation of the right amount of resin is an approximate estimate for the installer.
Verify the variability of the data shown in the table
depending on the effective grooving thickness realized.

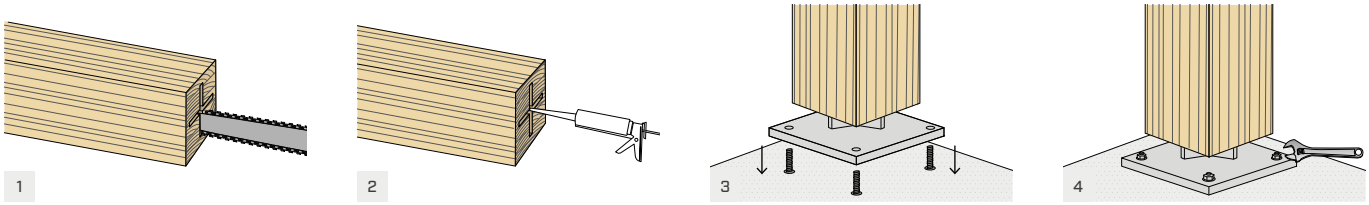
ASSEMBLY

VIDEO

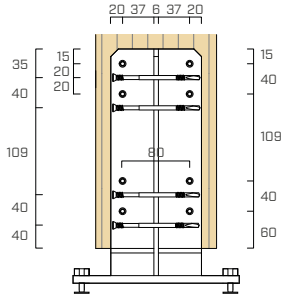
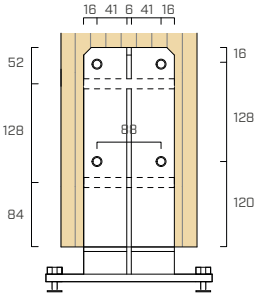
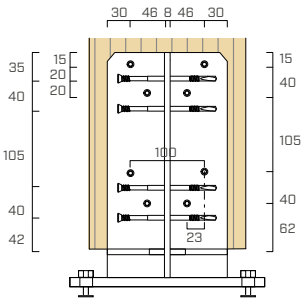
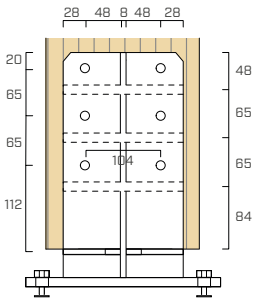
XS10



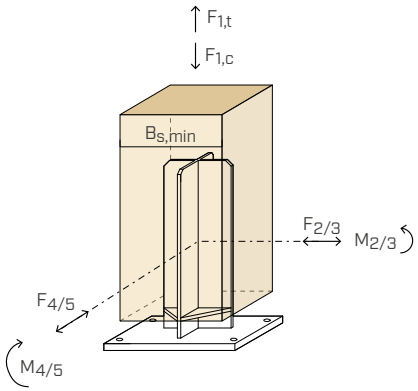
XR10



XS10 FASTENING CONFIGURATIONS

XS10120		XS10160	
S1 - SBD SBD self-drilling dowels	**S1 - STA** smooth dowels STA	**S2 - SBD** SBD self-drilling dowels	**S2 - STA** smooth dowels STA
			

STATIC VALUES



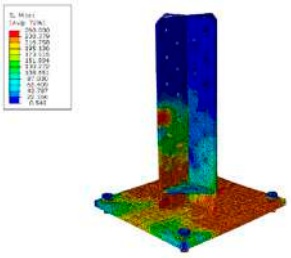
XS10

CODE	config.	fasteners for timber		column	COMPRESSION	TENSION		SHEAR[1] [2]		MOMENT[1]		
				$B_{s,min}$	$R_{1,c\ k\ timber}$	$R_{1,t\ k\ steel}$		$R_{2/3\ k\ steel} = R_{4/5\ k\ steel}$		$M_{2/3\ k\ timber} = M_{4/5\ k\ timber}$	$M_{2/3\ k\ steel} = M_{4/5\ k\ steel}$	
		type	pcs - Ø x L [mm]	[mm]	[kN]	[kN]	γ_{steel}	[kN]	γ_{steel}	[kNm]	[kNm]	γ_{steel}
XS10120	S1 - SBD	SBD Ø7,5	16 - Ø7,5 x 115	140 x 140	**133,0**	**32,6**	γ_{M0}	**3,97**	γ_{M0}	**3,03**	**0,90**	γ_{M0}
			16 - Ø7,5 x 135	160 x 160	**149,0**	**32,6**		**3,97**		**3,34**	**0,90**	
	S1 - STA	STA Ø12	8 - Ø12 x 120	160 x 160	**125,0**	**32,6**		**4,01**		**2,09**	**0,90**	
XS10160	S2 - SBD	SBD Ø7,5	16 - Ø7,5 x 135	160 x 160	**197,0**	**59,0**	γ_{M0}	**7,99**	γ_{M0}	**3,33**	**1,83**	γ_{M0}
			16 - Ø7,5 x 155	200 x 200	**213,0**	**59,0**		**7,99**		**3,68**	**1,83**	
	S2 - STA	STA Ø12	12 - Ø12 x 160	200 x 200	**182,0**	**59,0**		**8,29**		**6,74**	**1,83**	

XR10

CODE	fastening	column	COMPRESSION	TENSION		SHEAR[1] [2]		MOMENT[1]		
		$B_{s,min}$	$R_{1,c\ k\ timber}$	$R_{1,t\ k\ steel}$		$R_{2/3\ k\ steel} = R_{4/5\ k\ steel}$		$M_{2/3\ k\ timber} = M_{4/5\ k\ timber}$	$M_{2/3\ k\ steel} = M_{4/5\ k\ steel}$	
	type	[mm]	[kN]	[kN]	γ_{steel}	[kN]	γ_{steel}	[kNm]	[kNm]	γ_{steel}
XR10120	XEPOX adhesive[3]	160 x 160	**105,0**	**32,6**	γ_{M0}	**3,97**	γ_{M0}	**4,35**	**0,90**	γ_{M0}

XR10 NUMERICAL MODELING



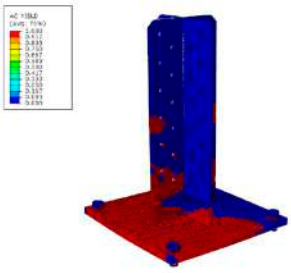
Mises stress in the plate and the anchors.

Investigation on the load bearing capacity and plastic deformation history of XR10 post base via finite element analysis.

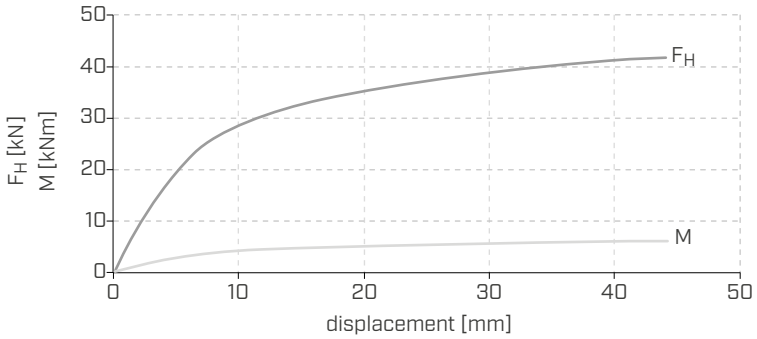
JOINT LOAD BEARING CAPACITY - STEEL SIDE

vertical load	**N**	[kN]	50	25	0
horizontal load(*)	$\mathbf{F_{H,max}}$	[kN]	40,77	49,49	50,64
bending capacity	$\mathbf{M_{max}}$	[kNm]	6,12	7,42	7,60

(*) Shear force application point F_H at a height e = 150 mm.



Yield stress in the plate and in the anchors.



The analyses show how the application of a compression load (N) does not significantly affect the overall strength of the connection upon reaching the bending limit value of the bottom plate (M = Max).

NOTES:

(1) Provide orthogonal reinforcement to the grain for each load direction, installing 2 screws VGZ Ø7 x $B_{s,min}$ above the vertical flanges.

(2) Limit value of the bottom plate for shear stress application at a height of e = 220 ÷ 230 mm.

(3) We recommend using XEPOX F.

GENERAL PRINCIPLES:

- The strength values indicated in the table are valid in compliance with the fasteners installation according to the configurations indicated.
- Characteristic values are consistent with EN 1995-1-1 and in accordance with ETA-10/0422 (XS10).
- The design values are obtained as follows:

$$R_d = min \begin{cases} \dfrac{R_{i,k\ timber} \cdot k_{mod}}{\gamma_{timber}} \\ \dfrac{R_{i,k\ steel}}{\gamma_{steel}} \end{cases}$$

The coefficients k_{mod} and y should be taken according to the current regulations used for the calculation.

The verification of the fastener-to-concrete connection must be carried out separately.

- The moment and shear strength values are calculated individually not taking into account the stabilizing contributions, if any, deriving from the compressive stress that influence the overall strength of the connection. In case of combined loading the verification must be carried out separately.
- For the calculation process a timber density ρ_k = 350 kg/m^3 has been considered.
- Dimensioning and verification of timber and concrete elements must be carried out separately.