X10 CROSS-SHAPED POST BASE



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







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	lower holes	Н	knife plate thickness	cross shaped blades	pcs
	[mm]	[n. x mm]	[mm]	[mm]		
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	lower holes	H knife plate thickness		cross shaped blades	pcs
	[mm]	[n. x mm]	[mm]	[mm]		
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

ADDITIONAL PRODUCTS - FASTENING

type	description	d	support	page
		[mm]		
SBD	self-drilling dowel	7,5	2)))))	48
STA	smooth dowel	12	27777	54
KOS	bolt	M12	<i>عا</i>	526
XEPOX F	epoxy adhesive	-	2////	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







XR10120



L

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]	144	176	
	V plate	[mm ³]	353780		
	Δ V	[mm ³]	402220	546700	
	waste coefficient		1,	4	
	amount of resin	[mm ³]	563109	765381	
	required	[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.







1 XR10













2

IDEO



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XS10 FASTENING CONFIGURATIONS



STATIC VALUES



XS10

			COMPRESSION	TENSION		SHEAR ^{(1) (2)}		MOMENT ^[1]							
CODE	config.	fasteners for timber		column 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} M _{4/5}	steel = k steel			
		type	pcs - Ø x L [mm]	[mm]	[kN]	[kN] γ _{steel}		[kN]	Ysteel	[kNm]	[kNm] γ _{steel}				
XS10120 S	S1 - SBD SBD Ø	SPD Ø7 F	16 - Ø7,5 x 115	140 x 140	133,0	32,6		3,97		3,03	0,90				
		31-360 360 0	360 07,5	16 - Ø7,5 x 135	160 x 160	149,0	32,6	γмо	3,97	γмо	3,34	0,90	γмо		
	S1 - STA	STA Ø12	8 - Ø12 x 120	160 x 160	125,0	32,6		4,01		2,09	0,90				
XS10160	S2 - SBD	CO. CDD	C2 CD2	63 600 G	CRD Ø7 F	16 - Ø7,5 x 135	160 x 160	197,0	59,0		7,99		3,33	1,83	
		360 07,5	16 - Ø7,5 x 155	200 x 200	213,0	59,0	γмо	7,99	Υмо	3,68	1,83	γмо			
	S2 - STA	STA Ø12	12 - Ø12 x 160	200 x 200	182,0	59,0		8,29		6,74	1,83				

XR10

			COMPRESSION	TENS	ION	SHEA	R ^{(1) (2)}	2) MOMENT ^[1]						
CODE	fastening	column B _{s,min}	R _{1,c k timber}	R _{1,t k steel}		R _{1,t k steel}		R _{1,t k steel}		R _{2/3 k} R _{4/5}	steel = k steel	M _{2/3 k timber} = M _{4/5 k timber}	M _{2/3 k} M _{4/5 k}	steel = c steel
	type	[mm]	[kN]	[kN]	Ysteel	[kN]	Ysteel	[kNm]	[kNm]	Ysteel				
XR10120	XEPOX adhesive ⁽³⁾	160 x 160	105,0	32,6	γмо	3,97	γмо	4,35	0,90	γмо				

XR10 NUMERICAL MODELING



Mises stress in the plate and the anchors.

A SHR

Yield stress in the plate and in 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	Ν	[kN]	50	25	0
horizontal load ^(*)	F _{H,max}	[kN]	40,77	49,49	50,64
bending capacity	M _{max}	[kNm]	6,12	7,42	7,60

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



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 $\rm B_{s,min}$ above the vertical flanges.
- $^{(2)}$ Limit value of the bottom plate for shear stress application at a height of e = 220 \div 230 mm.
- $^{\rm (3)}$ We recommend using XEPOX F.

GENERAL PRINCIPLES:

 $R_d = min$

- 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:

 $\begin{cases} \frac{R_{i,k \text{ timber}} \cdot k_{mod}}{\gamma_{timber}} \\ \frac{R_{i,k \text{ steel}}}{\gamma_{steel}} \end{cases}$

The coefficients ${\rm k}_{\rm mod}$ 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.