

BENDING MOMENT RESISTANT POST BASE

TWO VERSIONS

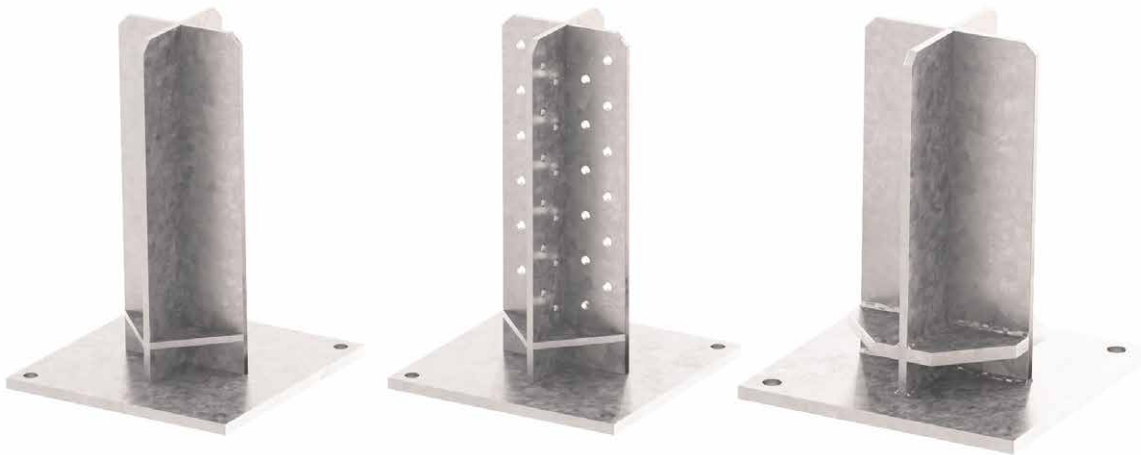
Without holes for use with self drilling dowels, smooth dowels or bolts;
with holes, for use with epoxy adhesive.

CONCEALED JOINT

Totally concealed installation. Different resistance depending on the fastening configuration selected.

FIXED-END

Bending moment resistant connection for base restraint. Resistance values are available for both axes of the post base.



CHARACTERISTICS

FOCUS	concealed joints	
COLUMNS	from 120 x 120 mm to 240 x 240 mm	6 x 6 inch to 10 x 10 inch
HEIGHT	adjustable from 50 to 200 mm	1,97 to 7,87 inch
FASTENERS	SBD, STA, XEPOX, VIN-FIX PRO	

VIDEO

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



MATERIAL

Hot dip galvanized carbon steel.

FIELDS OF USE

Bending moment resistant connections for outdoor use. Suitable for outdoor use (suitable for dry and wet service conditions)

- solid timber, glulam and LVL



BRACING-FREE STRUCTURES

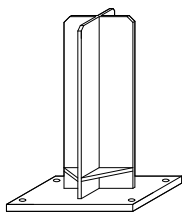
The base restraint can absorb horizontal loads allowing to realize pergolas or gazebos which do not require bracings and are open on all sides.

XEPOX

The cross shaped configuration and the fastener disposition are designed to guarantee a bending moment resistance, creating a semi-rigid restraint at the base of the post.

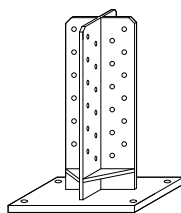
CODES AND DIMENSIONS

XS10 - fastening with dowels or bolts



CODE	bottom plate		lower holes		H		knife plate thickness		cross shaped blades	pcs
	[mm]	[in]	[n. x mm]	[n. x in]	[mm]	[in]	[mm]	[in]		
XS10120	220 x 220 x 10	8.66 x 8.66 x 0.39	4 x Ø13	4 x Ø0.51	310	12.21	6	0.24	smooth	1
XS10160	260 x 260 x 12	10.23 x 10.23 x 0.47	4 x Ø17	4 x Ø0.67	312	12.28	8	0.32	smooth	1

XR10 - fastening with resin for wood



CODE	bottom plate		lower holes		H		knife plate thickness		cross shaped blades		pcs
	[mm]	[in]	[n. x mm]	[n. x in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	
XR10120	220 x 220 x 10	8.66 x 8.66 x 0.39	4 x Ø13	4 x Ø0.51	310	12.20	6	0.24	holes Ø8	holes Ø0.32	1

Not holding CE marking.

MATERIAL AND DURABILITY

TYP X: S235(*) hot dip galvanized carbon steel.

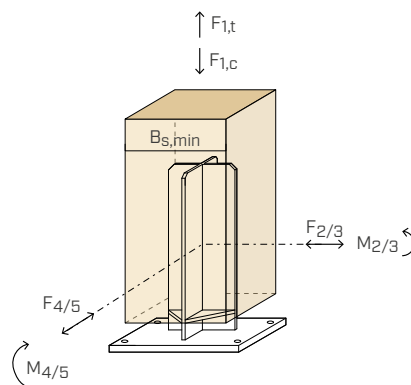
To be used in dry and wet services conditions.

(*) Comparable to A36 steel.

FIELD OF USE

- Solid timber, glulam or LVL columns

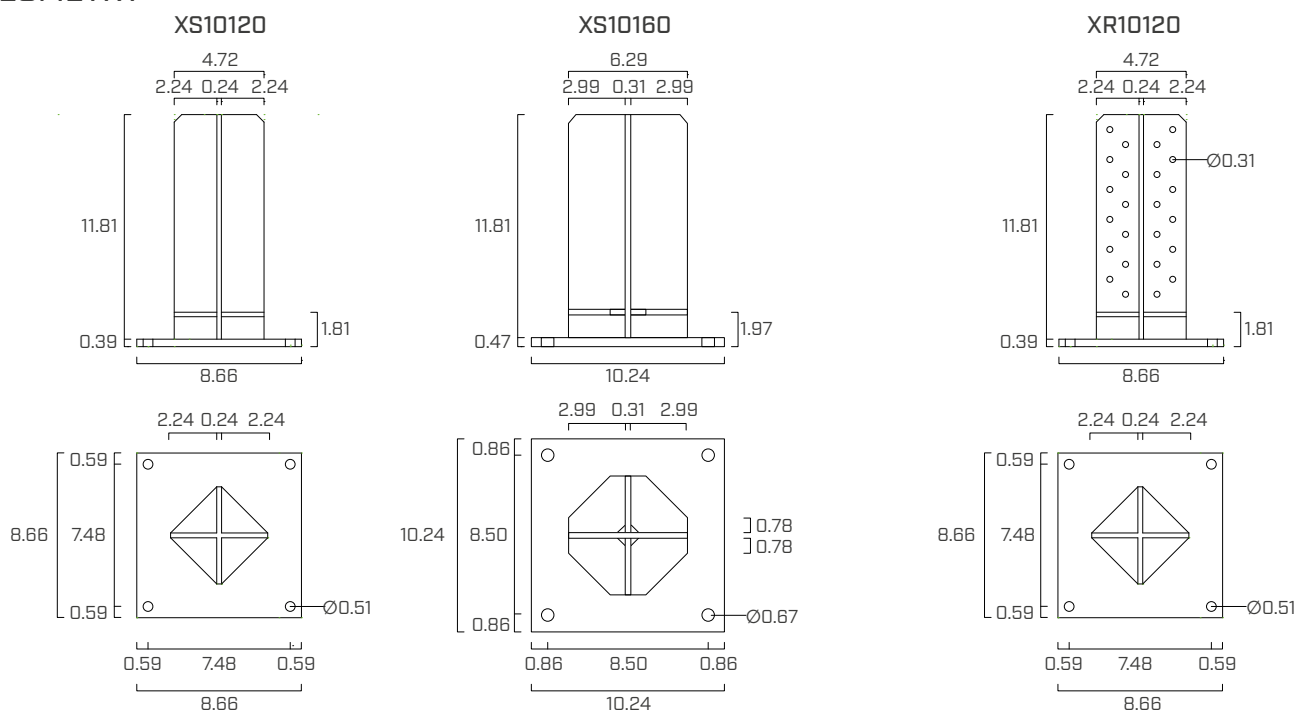
EXTERNAL LOADS



ADDITIONAL PRODUCTS - FASTENING

type	description		d		support
			[mm]	[in]	
SBD	self-drilling dowel		7.5	0.30	
STA	smooth dowel		12	0.48	
KOS	bolt		M12	0.48	
XEPOX F	epoxy adhesive		-	-	
AB1	metal anchor		12-16	0.48-0.63	
SKR	screw anchor		12-16	0.48-0.63	
VIN-FIX PRO	chemical anchor		M12-M16	0.48-0.63	
EPO-FIX PLUS	chemical anchor		M12-M16	0.48-0.63	

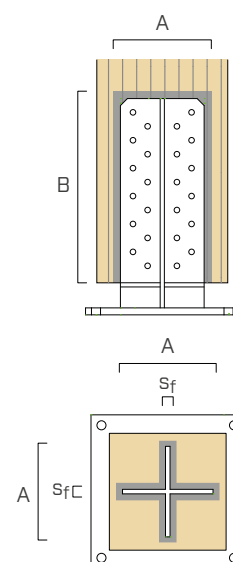
GEOMETRY



INSTALLATION

ESTIMATE OF THE REQUIRED AMOUNT OF XEPOX RESIN - XR10

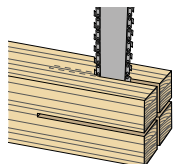
	grooving thickness s_f	[mm]	10	12
		[in]	0.39	0.47
Examples of dimensions of the grooving	A horizontal grooving	[mm]	140	140
		[in]	5.5	5.5
B horizontal grooving		[mm]	280	280
		[in]	11.0	11.0
V grooving		[mm ³]	756000	900480
		[in ³]	46.13	54.95
V plate holes		[mm ³]	14476	
		[in ³]	0.88	
V plate		[mm ³]	353780	
		[in ³]	21.59	
ΔV		[mm ³]	402220	546700
		[in ³]	24.55	33.36
waste coefficient			1,4	
amount of resin required		[mm ³]	563109	765381
		[in ³]	34.36	46.71
		[litre]	0.60	0.80
		[oz]	20.29	27.05



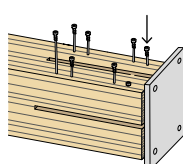
The evaluation of the right amount of resin is an approximate estimate for the installer. Verify the variability of the data shown in the table depending on the effective grooving thickness realized.

ASSEMBLY

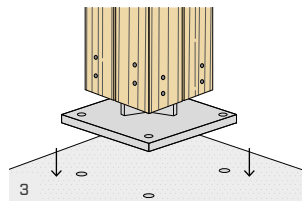
XS10



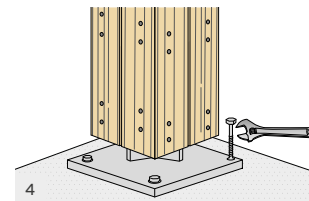
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2

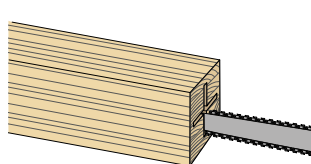


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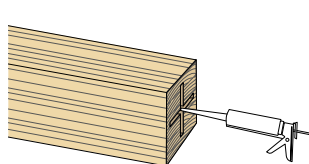


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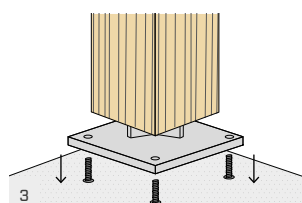
XR10



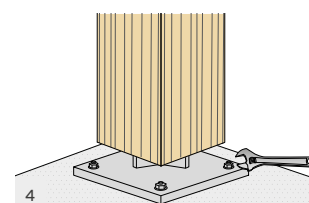
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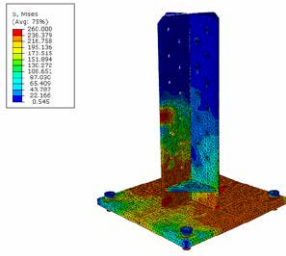


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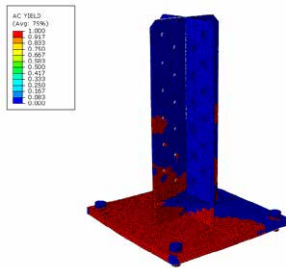


VIDEO

XR10 NUMERICAL MODELING



Mises stress in the plate and the anchors.



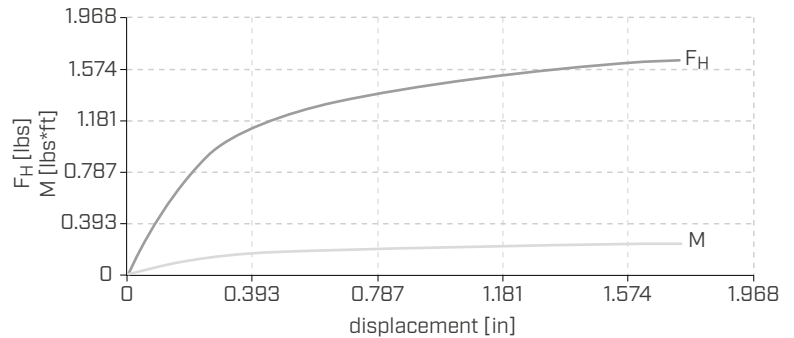
Yield stress in the plate and in the anchors.

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

JOINT LOAD BEARING CAPACITY - STEEL SIDE

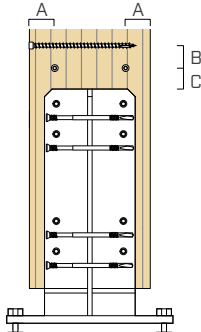
vertical load	N	[kN]	50	25	0
		[lbs]	11,240.44	5,620.22	0
horizontal load ^(*)	F_{H,max}	[kN]	40.77	49.49	50.64
		[lbs]	9,165.46	11,125.79	11,384.32
bending capacity	M_{max}	[kNm]	6.12	7.42	7.60
		[lbs*ft]	4,513.88	5,472.71	5,605.47

^(*) Shear force application point F_H at a height $e = 150$ mm (5.90 inch).



The analysis shows 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 ($M = \text{Max}$).

REINFORCEMENT PERPENDICULAR TO THE GRAIN



If the post base needs to withstand the bending moment, it is needed to insert VGZ Ø7 screws as a reinforcement perpendicular to the grain.

A	min a_{2CG}	[mm]	21
		[inch]	0.83
B	min a_{CROSS}	[mm]	11
		[inch]	0.43
C	min a_{1CG}	[mm]	56
		[inch]	2.20

The minimum distances in the table refer to a Ø7 mm diameter screw.

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) The bending moment due to the eccentricity of the shear force is not considered in the resistance values. The designer of the structure should implement the verification with the resistance of the steel plate.
- (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 NDS (2018).
- The verification of the fastener-to-concrete connection must be carried out separately.
- The moment and shear strength values are calculated individually. In case of combined loading the verification must be carried out separately.
- For the calculation process a timber with a specific gravity of 0.49 has been considered (douglas fir-larch, north).

- Dimensioning and verification of timber structural elements and concrete elements must be carried out separately.
- The values are calculated according to the NDS (2018). The tabled reference design values are unfactored and should be multiplied by the adjustment factors to get the adjusted design values.
- The designer of the structure should implement the verification with the resistance of the steel plate and steel to concrete resistance of the connection.
- The calculation of the smooth dowels resistance is done for the fasteners driven into properly sized holes (holes diameter = dowels diameter) in dry material.
- The calculation is an indication of the reference design resistance. It is up to the designer to understand and confirm the resistance values.
- The compression resistance of the post base is calculated considering the bearing of the timber section on the steel plates supporting the timber column.
- All the dimensions in the drawings are expressed in inches.