X10

CROSS-SHAPED POST BASE

VIDEO

CE
ETA-10/0422

PARTIAL INTERLOCKING IN TWO DIRECTIONS

Resistant to bending moment in both directions, for the creation of a partial interlocking in the bracing of canopies and shelters. Strength and stiffness values tested.

TWO VERSIONS

Without holes for use with self drilling dowels, smooth dowels or bolts; with holes, for use with XEPOX epoxy adhesive. Both versions are hot-dip galvanised for maximum durability in outdoor settings.

CONCEALED JOINT

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

USA, Canada and more design values available online.

SERVICE CLASS SC1 SC2 SC3

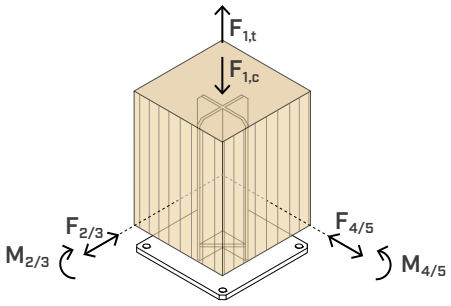
MATERIAL

S235 HDG55 S235 carbon steel with hot galvanising 55 µm

GROUND CLEARANCE

from 46 to 50 mm

EXTERNAL LOADS



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

FIELDS OF USE

Ground joints for moment-resistant columns in both directions.
Pergolas, carports, gazebos.

Suitable for columns in:

- solid timber softwood and hardwood
- glulam, 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.

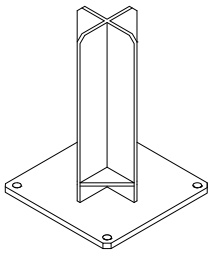
XEPOX

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

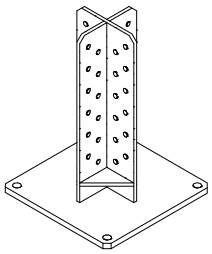
XS10 - fastening with dowels or bolts

CODE	bottom plate [mm] *[in]*	lower holes [n. x mm] *[n. x in]*	H [mm] *[in]*	knife plate thickness [mm] *[in]*	cross shaped blades	pcs
XS10120	220 x 220 x 10 *8 5/8 x 8 5/8 x 0.39*	4 x Ø13 *4 x Ø0.51*	310 *12 3/16*	6 *0.24*	smooth	1
XS10160	260 x 260 x 12 *10 1/4 x 10 1/4 x 0.47*	4 x Ø17 *4 x Ø0.67*	312 *12 5/16*	8 *0.31*	smooth	1



XR10 - fastening with resin for wood

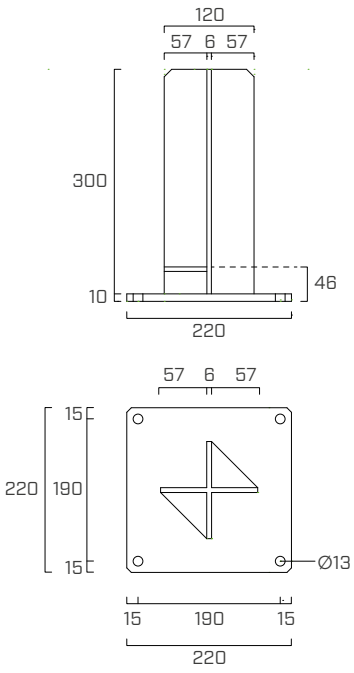
CODE	bottom plate [mm] *[in]*	lower holes [n. x mm] *[n. x in]*	H [mm] *[in]*	knife plate thickness [mm] *[in]*	cross shaped blades	pcs
XR10120	220 x 220 x 10 *8 5/8 x 8 5/8 x 0.39*	4 x Ø13 *4 x Ø0.51*	310 *12 3/16*	6 *0.24*	holes Ø8 *holes Ø0.31*	1



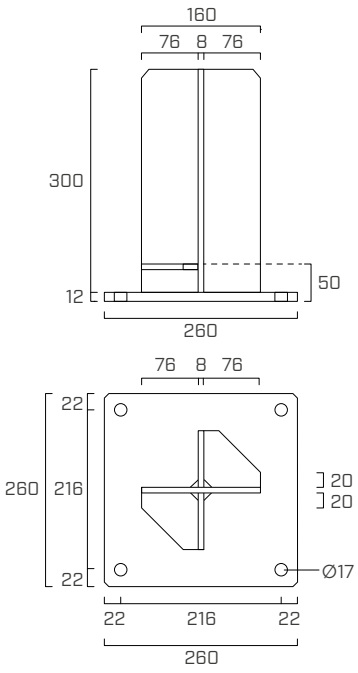
Not holding CE marking.

GEOMETRY

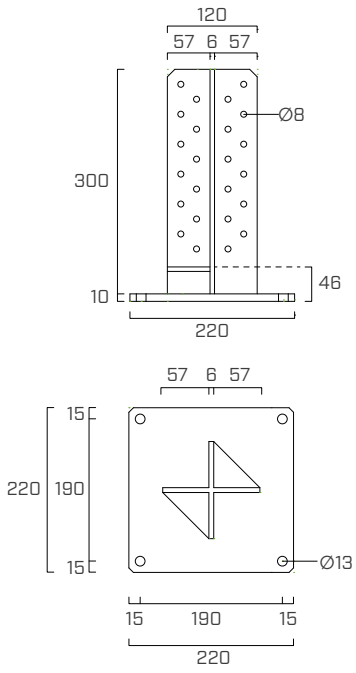
XS10120



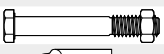
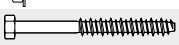
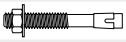
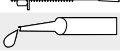
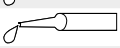
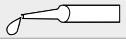
XS10160



XR10120

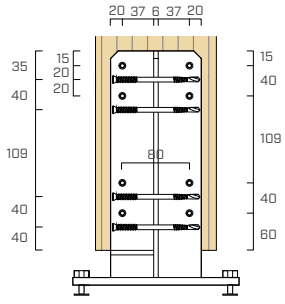


ADDITIONAL PRODUCTS - FASTENING

type	description		d [mm]	support	page
SBD	self-drilling dowel		7,5		154
STA	smooth dowel		12		162
KOS	hexagonal head bolt		M12		168
XEPOX F	epoxy adhesive		-		136
AB1	CE1 expansion anchor		12-16		536
SKR/SKR EVO	screw-in anchor		12-16		528
ABE	CE1 expansion anchor		M12 - M16		532
VIN-FIX	vinyl ester chemical anchor		M12-M16		545
HYB-FIX	hybrid chemical anchor		M12-M16		552
EPO-FIX	epoxy chemical anchor		M12-M16		557

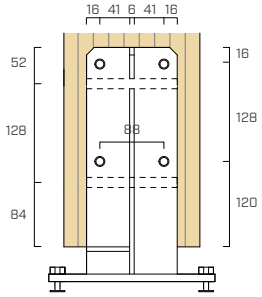
XS10 FASTENING CONFIGURATIONS

XS10120



S1 - SBD

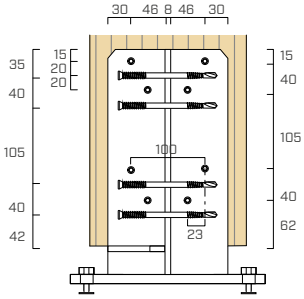
SBD self-drilling dowels



S1 - STA

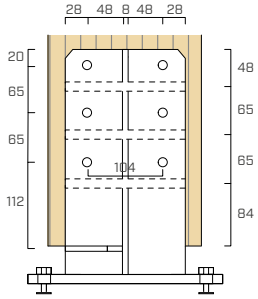
smooth dowels STA

XS10160



S2 - SBD

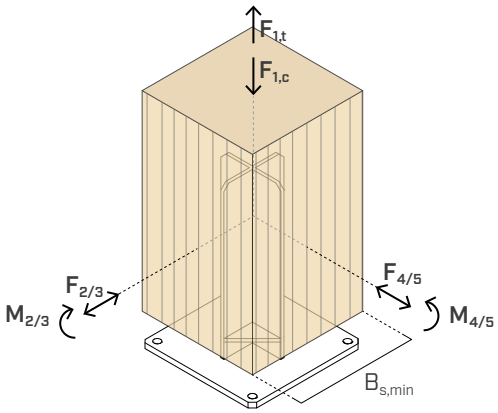
SBD self-drilling dowels

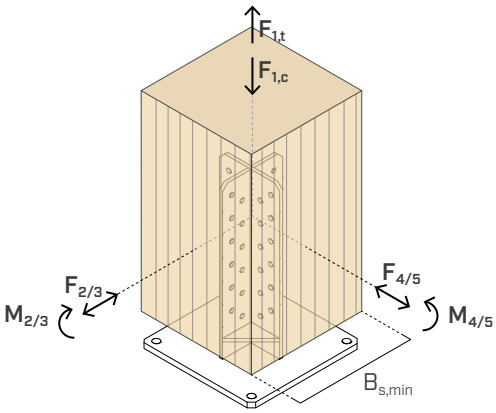


S2 - STA

smooth dowels STA

STRUCTURAL VALUES





XS10

CODE	config.	fasteners for timber		column	COMPRESSION	TENSION		SHEAR[1][2]		MOMENT[1]		
		type	pcs - Ø x L [mm]	$B_{s,min}$ [mm]	$R_{1,c\ k\ timber}$ [kN]	$R_{1,t\ k\ steel}$ [kN]	γ_{steel}	$R_{2/3\ k\ steel} = R_{4/5\ k\ steel}$ [kN]	γ_{steel}	$M_{2/3\ k\ timber} = M_{4/5\ k\ timber}$ [kNm]	$M_{2/3\ k\ steel} = M_{4/5\ k\ steel}$ [kNm]	γ_{steel}
XS10120	S1 - SBD[4]	SBD Ø7,5	16 - Ø7,5 x 115	140 x 140	134,0	32,6	γ_{M0}	4,0	γ_{M0}	3,0	5,9	γ_{M0}
			16 - Ø7,5 x 135	160 x 160	154,0	32,6		4,0		3,3	5,9	
	S1 - STA	STA Ø12	8 - Ø12 x 120	160 x 160	125,0	32,6		4,0		2,1	5,9	
XS10160	S2 - SBD[4]	SBD Ø7,5	16 - Ø7,5 x 135	160 x 160	205,0	59,0	γ_{M0}	8,0	γ_{M0}	3,3	11,5	γ_{M0}
			16 - Ø7,5 x 155	200 x 200	224,0	59,0		8,0		3,7	11,5	
	S2 - STA	STA Ø12	12 - Ø12 x 160	200 x 200	182,0	59,0		8,3		6,7	11,5	

XR10

CODE	fastening	column	COMPRESSION	TENSION		SHEAR[1][2]		MOMENT[1]		
	type	$B_{s,min}$ [mm]	$R_{1,c\ k\ timber}$ [kN]	$R_{1,t\ k\ steel}$ [kN]	γ_{steel}	$R_{2/3\ k\ steel} = R_{4/5\ k\ steel}$ [kN]	γ_{steel}	$M_{2/3\ k\ timber} = M_{4/5\ k\ timber}$ [kNm]	$M_{2/3\ k\ steel} = M_{4/5\ k\ steel}$ [kNm]	γ_{steel}
XR10120	XEPOX adhesive[3]	160 x 160	105,0	32,6	γ_{M0}	4,0	γ_{M0}	4,4	5,9	γ_{M0}

NOTES and GENERAL PRINCIPLES see page 480.

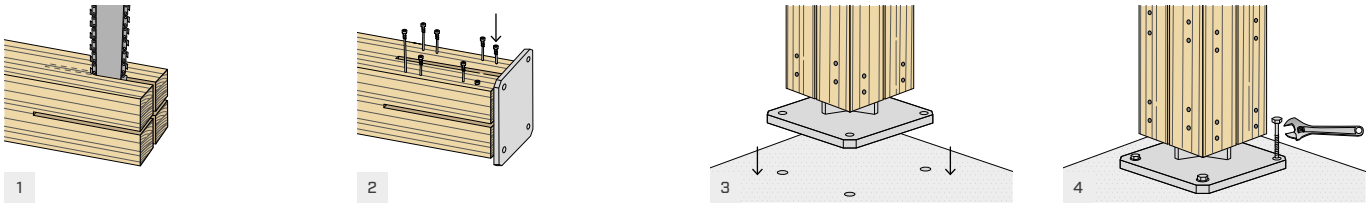
STIFFNESS

CODE	fasteners for timber	configuration pcs - Ø [mm]	$K_{2/3,ser} = K_{4/5,ser}$ [kNm/rad]
XS10120	S1 - SBD	16 - Ø7,5	55
	S2 - STA	8 - Ø12	140
XS10160	S1 - SBD	16 - Ø7,5	350
	S2 - STA	12 - Ø12	160

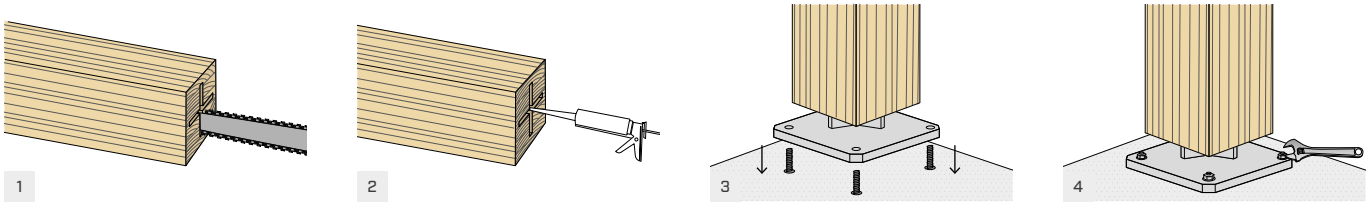
MOUNTING

VIDEO

XS10



XR10



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. The amount of resin required depends on the thickness of the routing:

- 0,4L for 8mm routing;
- 0,6L for 10mm routing;
- 0,8L for 12mm routing.

The values are obtained with a waste coefficient of 1.4.

(4) SBD self-drilling dowels Ø7,5: M_{yk} = 75000 Nmm.

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 1995-1-1:2014 and in accordance with ETA-10/0422 (XS10).
- The design values are obtained as follows:

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

The coefficients k_{mod}, γ_M and γ_{Mi} 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.
- A timber density of ρ_k = 350 kg/m^3 was considered for the calculation process.
- Dimensioning and verification of timber and concrete elements must be carried out separately.
- Consider a milling in the timber with a thickness of 8mm for XS10120 and 10mm for XS10160.

UK CONSTRUCTION PRODUCT EVALUATION

- UKTA-0836-22/6374.