F70

“T” SHAPED POST BASE

VIDEO

DESIGN REGISTERED

ETA-10/0422

PARTIAL INTERLOCKING
Bending moment resistant for partial bracing of canopies and shelters. Strength and stiffness values tested.

INVISIBLE
The internal knife plate is used to create a totally concealed joint. Designed to accommodate columns of all dimensions. Hot-dip galvanisation and aluminium versions ensure durability in outdoor settings.

TWO VERSIONS
Without holes, to be used with self-drilling dowels; with holes, to be used with smooth dowels or bolts.

ALUMIDI
For compression and shear stress, the ALUMIDI aluminium bracket can be used as a post base with SBD self-drilling dowels.

CANADIAN DESIGN VALUES
USA, EU and more design values available online.

SERVICE CONDITION
WET

MATERIAL

S235 HDGS5 — **F70** versions **80**, **100**, **140**: carbon steel S235 with hot-dip galvanising 55 µm

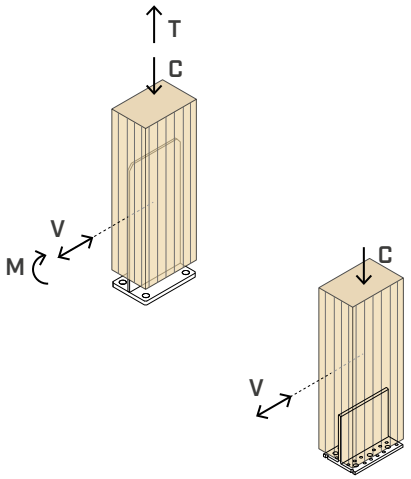
S355 HDGS5 — **F70** versions **180** and **220**: S355 carbon steel with hot-dip galvanising 55 µm

S235 HDG — **F70LIFT**: S235 hot dip bright zinc plated carbon steel

alu 6005A — **ALUMIDI**: EN AW-6005A° aluminium alloy

GROUND CLEARANCE
from 21 to 40 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 one direction.
Pergolas, carports, gazebos.

Suitable for columns in:
- solid timber softwood and hardwood
- Glulam, LVL

VERSATILE

It can be used not only as a post holder but also for the construction of cantilever beams (such as canopies, roofs, etc.).

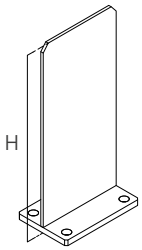
SPECIAL STRUCTURES

By means of a tension plate and a compression plate, it is possible to produce joints for large glulam columns.

CODES AND DIMENSIONS

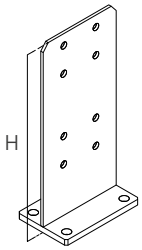
F70

CODE	H [mm] *[in]*	bottom plate [mm] *[in]*	base holes [n. x mm] *[n. x in]*	knife plate thickness [mm] *[in]*	pcs
F7080	156 *6 1/8*	80 x 80 x 6 *3 1/8 x 3 1/8 x 0.24*	4 x Ø9 *4 x Ø0.35*	4 *0.16*	1
F70100	206 *8 1/8*	100 x 100 x 6 *4 x 4 x 0.24*	4 x Ø9 *4 x Ø0.35*	6 *0.24*	1
F70140	308 *12 1/8*	140 x 140 x 8 *5 1/2 x 5 1/2 x 0.31*	4 x Ø11,5 *4 x Ø0.45*	8 *0.31*	1
F70180	400 *15 3/4*	180 x 120 x 12 *7 1/8 x 4 3/4 x 0.47*	4 x Ø18 *4 x Ø0.71*	6 *0.24*	1
F70220	400 *15 3/4*	220 x 140 x 15 *8 5/8 x 5 1/2 x 0.59*	4 x Ø18 *4 x Ø0.71*	6 *0.24*	1



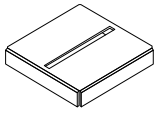
F70 L

CODE	H [mm] *[in]*	bottom plate [mm] *[in]*	base holes [n. x mm] *[n. x in]*	knife plate thickness [mm] *[in]*	knife plate hole [n. x mm] *[n. x in]*	pcs
F70100L	206 *8 1/8*	100 x 100 x 6 *4 x 4 x 0.24*	4 x Ø9 *4 x Ø0.35*	6 *0.24*	4 x Ø13 *4 x Ø0.51*	1
F70140L	308 *12 1/8*	140 x 140 x 8 *5 1/2 x 5 1/2 x 0.31*	4 x Ø11,5 *4 x Ø0.45*	8 *0.31*	6 x Ø13 *6 x Ø0.51*	1
F70180L	400 *15 3/4*	180 x 120 x 12 *7 1/8 x 4 3/4 x 0.47*	4 x Ø18 *4 x Ø0.71*	6 *0.24*	8 x Ø13 *8 x Ø0.51*	1
F70220L	400 *15 3/4*	220 x 140 x 15 *8 5/8 x 5 1/2 x 0.59*	4 x Ø18 *4 x Ø0.71*	6 *0.24*	12 x Ø13 *12 x Ø0.51*	1



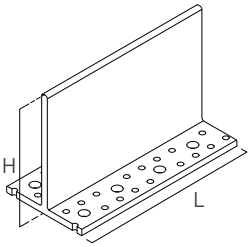
F70 LIFT

CODE	H [mm] *[in]*	plate [mm] *[in]*	thickness [mm] *[in]*	suitable for	pcs
F70100LIFT	20 *13/16*	120 x 120 *4 3/4 x 4 3/4*	2 *0.08*	F70100-F7100L	1
F70140LIFT	22 *7/8*	160 x 160 *6 1/4 x 6 1/4*	2 *0.08*	F70140-F70140L	1

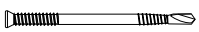
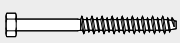
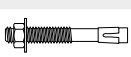
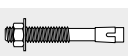
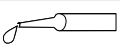


ALUMIDI

CODE	H [mm]	*[in]*	type	L [mm]	*[in]*	pcs
ALUMIDI80	109,4	*4 5/16*	without holes	80	*3 1/8*	25
ALUMIDI120	109,4	*4 5/16*	without holes	120	*4 3/4*	25
ALUMIDI160	109,4	*4 5/16*	without holes	160	*6 1/4*	25
ALUMIDI200	109,4	*4 5/16*	without holes	200	*8*	15
ALUMIDI240	109,4	*4 5/16*	without holes	240	*9 1/2*	15

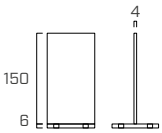


FASTENERS

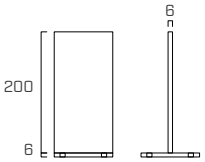
type	description		d [mm]	support
SBD	self-drilling dowel		7,5	
STA	smooth dowel		12	
KOS/KOT	hexagonal/round head bolt		M12	
SKR/SKR EVO	screw-in anchor		7,5 - 8 - 10 - 16	
AB1	CE1 expansion anchor		M10 - M16	
ABE A4	CE1 expansion anchor		M8 - M10	
VIN-FIX	vinyl ester chemical anchor		M8 - M10 - M16	
HYB-FIX	hybrid chemical anchor		M8 - M10 - M16	
EPO-FIX	epoxy chemical anchor		M8 - M10 - M16	

GEOMETRY

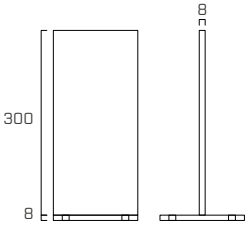
F7080



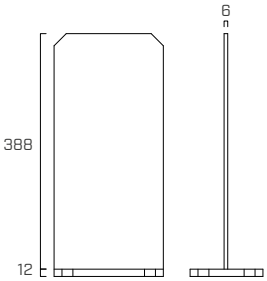
F70100



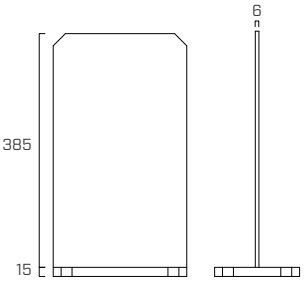
F70140

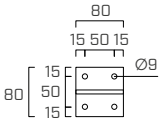


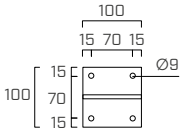
F70180

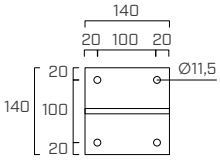


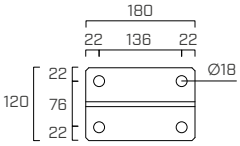
F70220

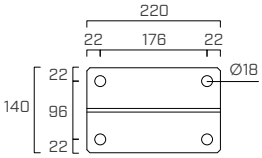




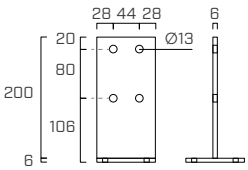




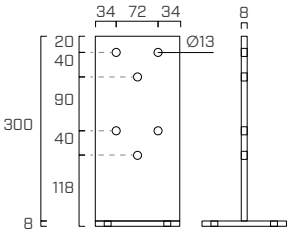




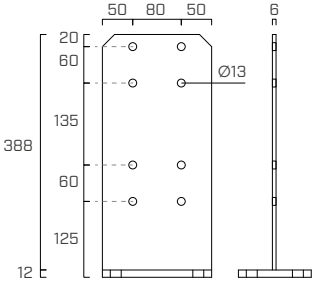
F70100L



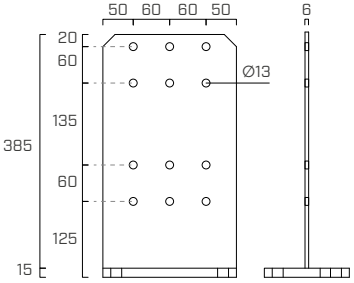
F70140L

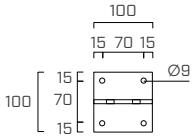


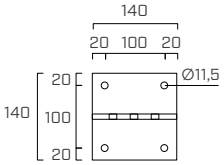
F70180L

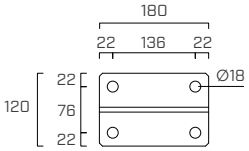


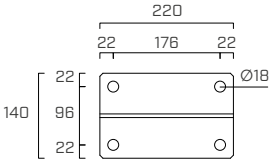
F70220L



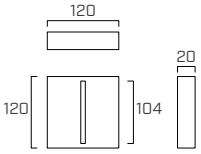




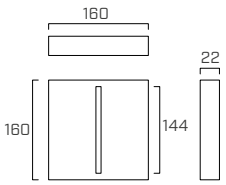




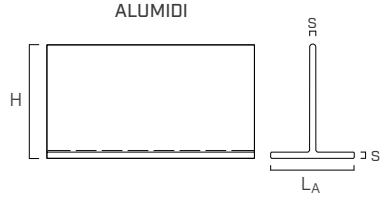
F70100LIFT

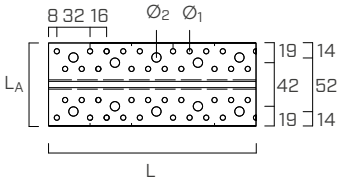


F70140LIFT



ALUMIDI



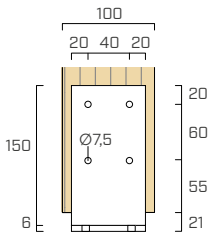


ALUMIDI			
thickness	**s**	[mm]	6
flange width	**L_A**	[mm]	80
height	**H**	[mm]	109,4
small flange-holes	**$Ø_1$**	[mm]	5,0
large flange-holes	**$Ø_2$**	[mm]	9,0

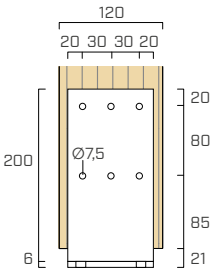
FASTENING CONFIGURATIONS

F70 WITH SBD SELF-DRILLING DOWELS

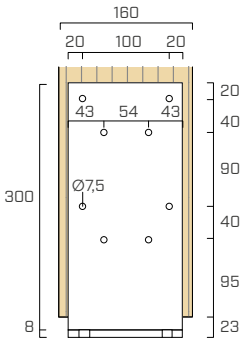
F7080



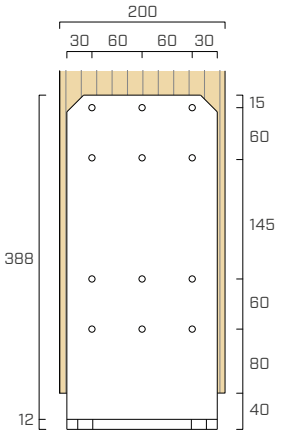
F70100



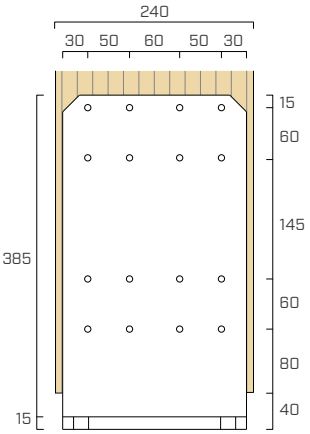
F70140



F70180

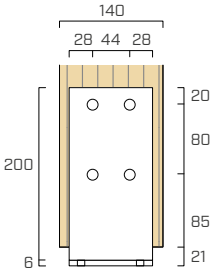


F70220

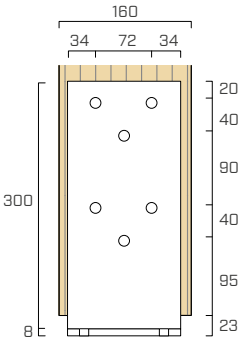


F70 WITH STA SMOOTH DOWELS OR BOLTS

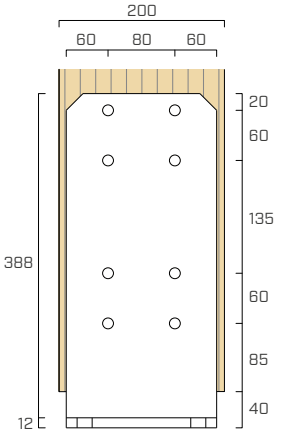
F70100L



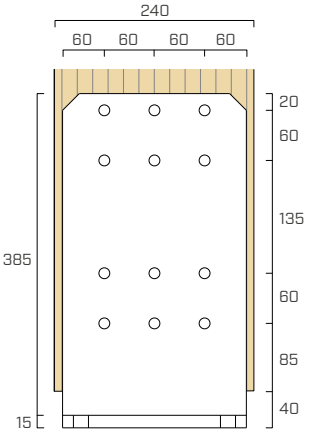
F70140L



F70180L

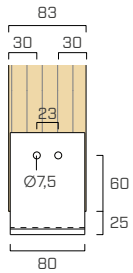


F70220L

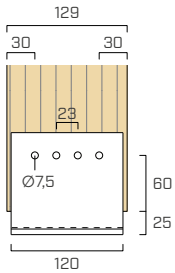


ALUMIDI WITH SBD SELF-DRILLING DOWELS

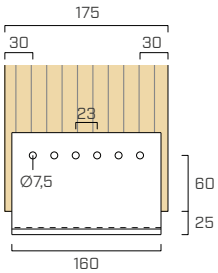
ALUMIDI80



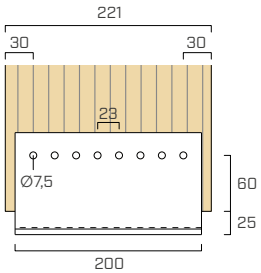
ALUMIDI120



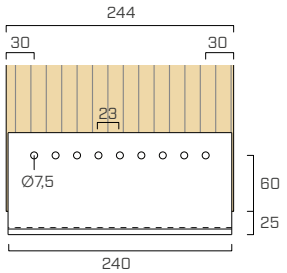
ALUMIDI160

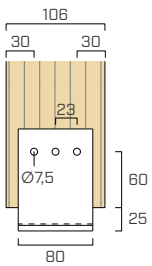


ALUMIDI200



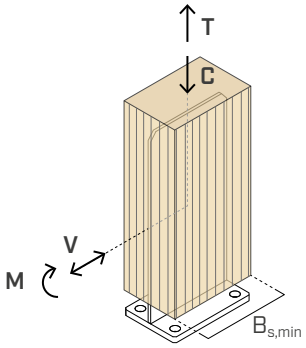
ALUMIDI240

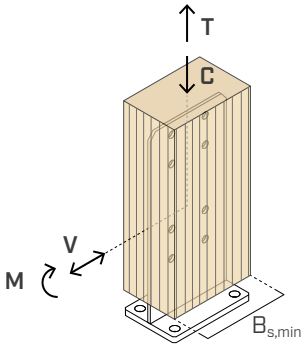




STRUCTURAL VALUES | F70

STRENGTH VALUES
CSA-O86 2019
CSA-S16 2014





F70

CODE	fasteners for timber SBD Ø7,5(1)	column $B_{s,min}$	COMPRESSION		TENSION		SHEAR		MOMENT	
	pcs - Ø x L [mm]	[mm]	$C_{r,timber}$(3) [kN]	$C_{r,steel}$(4) [kN]	$T_{r,timber}$(3) [kN]	$T_{r,steel}$ [kN]	$V_{r,timber}$ [kN]	$V_{r,steel}$(5) [kN]	$M_{r,timber}$(3)(6) [kNm]	$M_{r,steel}$(7) [kNm]
F7080	4-Ø7,5x75	100x100	**20,5**	**30,7**	**14,7**	**24,4**	**9,1**	**4,7**	**0,4**	**0,5**
F70100	6-Ø7,5x95	120x120	**32,0**	**60,3**	**37,7**	**21,8**	**13,4**	**13,7**	**0,7**	**2,0**
F70140	8-Ø7,5x115	160x160	**47,1**	**122,2**	**64,1**	**37,9**	**23,2**	**17,2**	**1,3**	**3,5**
F70180	12-Ø7,5x155	160x200	**91,5**	**110,7**	**103,8**	**217,9**	**36,6**	**25,7**	**2,5**	**6,5**
F70220	16-Ø7,5x175	200x240	**121,0**	**141,6**	**155,4**	**318,9**	**51,6**	**45,1**	**4,1**	**11,4**

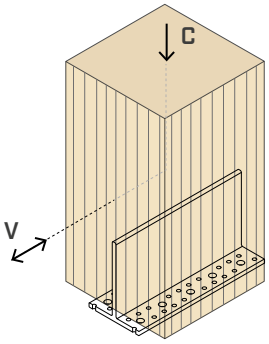
F70 L

CODE	fasteners for timber STA Ø12(2)	column $B_{s,min}$	COMPRESSION		TENSION		SHEAR		MOMENT	
	pcs - Ø x L [mm]	[mm]	$C_{r,timber}$(3) [kN]	$C_{r,steel}$(4) [kN]	$T_{r,timber}$(3) [kN]	$T_{r,steel}$ [kN]	$V_{r,timber}$ [kN]	$V_{r,steel}$(5) [kN]	$M_{r,timber}$(3)(6) [kNm]	$M_{r,steel}$(7) [kNm]
F70100L	4-Ø12x120	140x140	**32,3**	**60,3**	**39,1**	**21,8**	**18,0**	**13,7**	**0,8**	**2,0**
F70140L	6-Ø12x140	160x160	**55,7**	**139,7**	**75,4**	**37,9**	**26,2**	**16,7**	**1,5**	**3,5**
F70180L	8-Ø12x160	160x200	**90,1**	**102,8**	**79,7**	**217,9**	**32,2**	**25,7**	**2,5**	**6,5**
F70220L	12-Ø12x180	200x240	**132,4**	**131,4**	**135,2**	**314,6**	**45,2**	**45,1**	**4,5**	**11,4**

STIFFNESS

CODE	fasteners for timber	configuration pcs - Ø [mm]	$K_{2/3,ser}$ [kNm/rad]
F70100	SBD	6 - Ø7,5	60
F70140		8 - Ø7,5	190
F70180		12 - Ø7,5	640
F70220		16 - Ø7,5	900
F70100L	STA	4 - Ø12	50
F70140L		6 - Ø12	190
F70180L		8 - Ø12	580
F70220L		12 - Ø12	700

NOTES and GENERAL PRINCIPLES see page 8.



				COMPRESSION
CODE	**L**	**fasteners for timber SBD Ø7,5[1]**	**column $B_{s,min}$**	**$C_{r,\ timber}$[3]**
	[mm]	pcs - Ø x L [mm]	[mm]	[kN]
ALUMIDI80	80	2-Ø7,5x75	83	**6,4**
ALUMIDI80	80	3-Ø7,5x95	106	**10,4**
ALUMIDI120	120	4-Ø7,5x115	129	**15,1**
ALUMIDI160	160	6-Ø7,5x155	175	**26,2**
ALUMIDI200	200	8-Ø7,5x195	221	**39,4**
ALUMIDI240	240	9-Ø7,5x235	244	**48,3**

				SHEAR
CODE	**L**	**fasteners for timber SBD Ø7,5[1]**	**column $B_{s,min}$**	**$V_{r,\ timber}$**
	[mm]	pcs - Ø x L [mm]	[mm]	[kN]
ALUMIDI80	80	2-Ø7,5x75	83	**7,0**
ALUMIDI80	80	3-Ø7,5x95	106	**11,6**
ALUMIDI120	120	4-Ø7,5x115	129	**18,6**
ALUMIDI160	160	6-Ø7,5x155	175	**31,7**
ALUMIDI200	200	8-Ø7,5x195	221	**46,1**
ALUMIDI240	240	9-Ø7,5x235	244	**56,2**

NOTES

[1] SBD Ø7,5, F_{yb}= 1034.2 MPa. Bending yield strength has been tested and evaluated in accordance with ASTM F1575 and ICC-ES Acceptance Criteria AC233.

[2] STA smooth dowel Ø12, F_{yb}= 275.8 MPa. Bending yield strength has been tested and evaluated in accordance with ASTM F1575 and ICC-ES Acceptance Criteria AC233.

[3] The effective length is L - 15 mm for SBD L ≥ 95 mm, and L - 8 mm for SBD with L ≤ 75 mm. For STA, L_{eff} = L. The embedment length is calculated using the following equation: $t_1 = (L_{eff} - t_2 - t_{mill})/2$ where L_{eff} is the effective length of the dowel, t_2 is the thickness of the steel plate, and t_{mill} is the thickness of the milled cut in the wood section, 2 mm was considered for the tabulated values.

[4] A milling of 2 mm has been considered to facilitate the escape of steel residues when drilling with SBD. This tolerance is also assumed to provide lateral restraint against buckling within the timber section. However, this assumption should be verified on a project-by-project basis, considering actual tolerances.

[5] The lateral force on the steel plate was calculated by considering the shear force applied at the center of the dowel group, which leads to a bending moment on the bottom plate.

[6] The moment capacities were calculated by introducing eccentricity to the axial compression failure mode. Eccentricity was calculated based on the assumption of e = d/6 + L/500. Where L is the length of the knife plate and d is the depth of the column. Values need to be recalculated for each real project using the actual length of compressive members.

[7] Moment resistance values are based on results obtained from the testing campaign.

GENERAL PRINCIPLES

- The calculations provided adhere to engineering design principles and comply with CSA 086-19 and CSA S16-14 standards. The timber resistance values reflect the minimum of the ductile and brittle failure modes, while the steel values indicate the governing capacity among the plate, weld, and dowel bearing.
- Timber can be used in both dry and wet service conditions according to CSA-O86. The listed values were calculated considering all factors (K_D=K_{SF}=K_T=K_{Sv}=K_{St}) to be equal to 1.0.
- The governing factored capacity between the timber and steel should be taken in the final design.
- Glulam (Douglas Fir-Larch 16c-E) with G = 0.49 were used for the timber sections. Steel (S235) for F70 versions 80, 100, and 140, and steel (S355) for F70 versions 180 and 220 were used in the calculated values.
- A fitting tolerance of 2 mm was used for the dowel holes in the timber section, and a 1 mm tolerance was applied for the steel holes on the knife plate.
- To prevent splitting and ensure load transfer occurs solely through the dowel, it is recommended to maintain a minimum gap of 15 mm between the top of the knife plate and the timber.
- The strength values indicated in the table are valid in compliance with the fasteners positioning and the timber column according to the configurations indicated.
- 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. Refer to ETA-10/0422 (F70) and ETA-09/0361 (ALUMIDI).
- Dimensioning and verification of timber and concrete elements must be carried out separately.

INTELLECTUAL PROPERTY

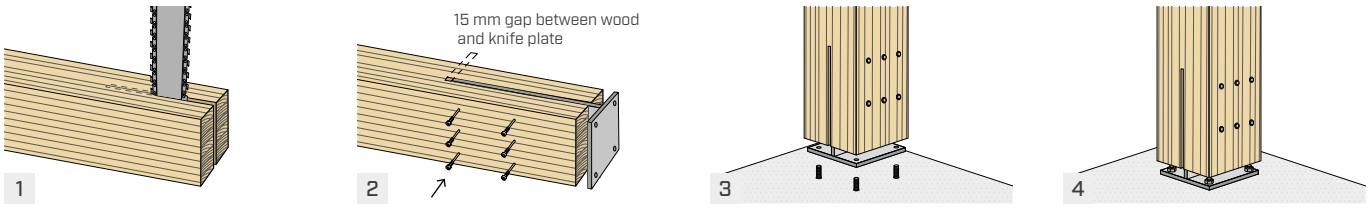
- Some models of F70 post bases are protected by the following Registered Community Designs:
  - RCD 015032190-0014;
  - RCD 015032190-0015.

UK CONSTRUCTION PRODUCT EVALUATION

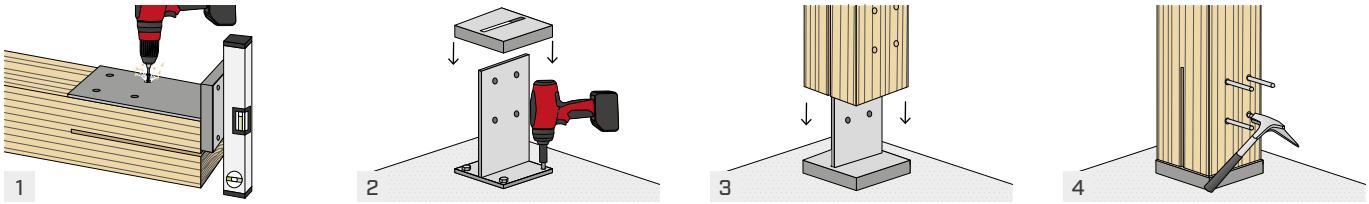
- UKTA-0836-22/6374.

MOUNTING

F70 or ALUMIDI with SBD self-drilling dowels



F70 L with STA dowels



ASSEMBLY WITH POSSIBILITY OF ADJUSTMENT

As an alternative to classic positioning, it is possible to assemble the product by levelling it as follows: