LOCK C CONCRETE

VIDEO

CE ETA 19/0831

CONCEALED HOOK TIMBER-TO-CONCRETE CONNECTOR

SIMPLE
Quick installation on concrete. Easy to hook system with screw anchors on the concrete side and self-drilling screws on the wood side.

REMOVABLE
Thanks to the hooking system, the wooden beams can be easily removed for seasonal requirements.

CONCEALED
Fastening on concrete is concealed. When installed without grooving, it generates an aesthetically pleasing joint shadow.

LOCK C FLOOR

CHARACTERISTICS

FOCUS	joints for concrete that can be disassembled
TIMBER SECTIONS	from 70 x 120 mm to 200 x 440 mm
STRENGTH	$R_{v,k}$ up to 65 kN
FASTENERS	LBS, SKS-E

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

MATERIAL

Aluminium alloy three dimensional perforated plate.

FIELDS OF USE

Timber-to-concrete shear joint
- solid timber and glulam
- CLT, LVL

BUILDING RECOVERY

The rod version is specially designed for fastening CLT floors to reinforced concrete beams or kerbs or masonry elements. Ideal for the restoration or renovation of existing buildings.

TIMBER-TO-CONCRETE

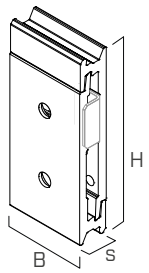
Ideal for the construction of roofs or pergolas near concrete supports. Concealed fastening and easy to install.

CODES AND DIMENSIONS

LOCK C Ø5

CODE	B	H	s	n_{screws} - Ø	$n_{anchors}$ - Ø	$n_{LOCKSTOP}$ - type	pcs *
	[mm]	[mm]	[mm]				
LOCKC53120	52,5	120	20	12 - Ø5	2 - Ø8	2 LOCKSTOP5	25

Screws, anchors and LOCK STOP not included in the package.
* number of connector pairs (wood side connector + concrete side connector)

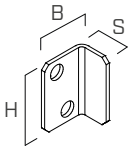


LOCKC53120

LOCK STOP Ø5

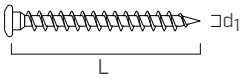
CODE	B	H	s	pcs
	[mm]	[mm]	[mm]	
LOCKSTOP5	19	27.5	13	100

The use of LOCK STOP is optional and does not affect structural performance.



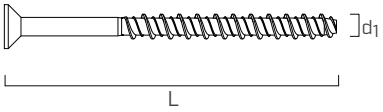
LBS

CODE	d_1	L	b	TX	pcs
	[mm]	[mm]	[mm]		
LBS550	5	50	46	TX20	200
LBS570	5	70	66	TX20	200



SKS-E

CODE	d_1	L	d_0	T_{inst}	TX	pcs
	[mm]	[mm]	[mm]	[Nm]		
SKS75100CE	8	100	6	20	TX30	50



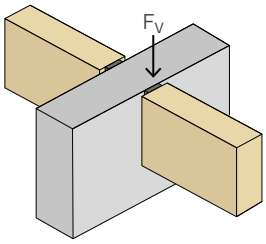
MATERIAL AND DURABILITY

LOCK C: EN AW-6005A aluminium alloy.
To be used in service classes 1 and 2 (EN 1995-1-1).

FIELD OF USE

- Timber-to-concrete or timber to-steel joints

EXTERNAL LOADS

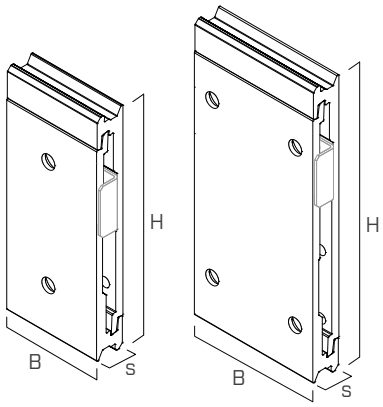


CODES AND DIMENSIONS

LOCK C Ø7

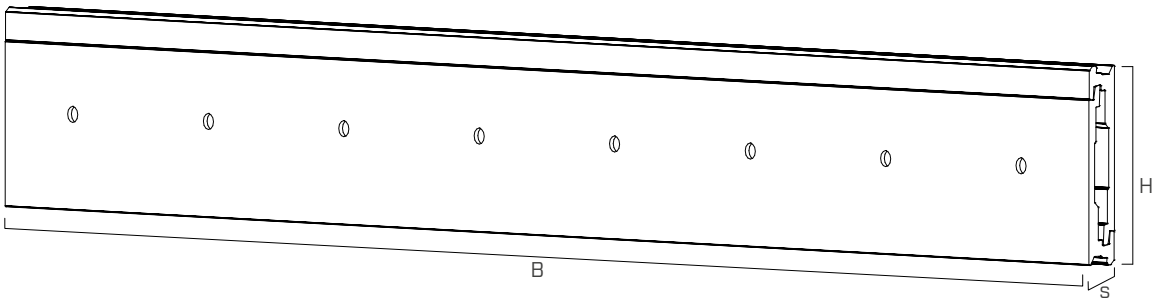
CODE	B	H	s	n_{screws} - Ø	$n_{anchors}$ - Ø	$n_{LOCKSTOP}$ - type	pcs*
	[mm]	[mm]	[mm]				
LOCKC75175	75	175	22	12 - Ø7	2 - Ø10	2 LOCKSTOP7	12
LOCKC100215	100	215	22	24 - Ø7	4 - Ø10	2 LOCKSTOP7	8

Screws, anchors and LOCK STOP not included in the package.
* number of connector pairs (wood side connector + concrete side connector)



LOCKC75175 LOCKC100215

LOCK C FLOOR Ø7



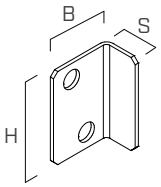
CODE	B	H	s	n_{screws} - Ø	$n_{anchors}$ - Ø	pcs*
	[mm]	[mm]	[mm]			
LOCKCFLOOR135	1200	135	22	32 - Ø7	8 - Ø10	1

Screws and anchors not included in the package.
* number of connector pairs (wood side connector + concrete side connector)

LOCK STOP Ø7

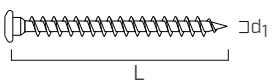
CODE	B	H	s	pcs
	[mm]	[mm]	[mm]	
LOCKSTOP7	26.5	38	15	50

The use of LOCK STOP is optional and does not affect structural performance.



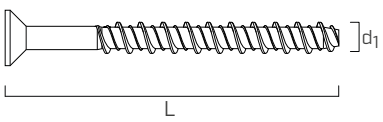
LBS

CODE	d_1	L	b	TX	pcs
	[mm]	[mm]	[mm]		
LBS780	7	80	75	TX30	100

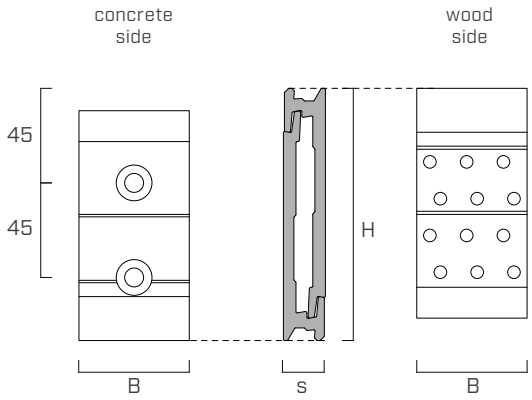


SKS-E

CODE	d_1	L	d_0	T_{inst}	TX	pcs
	[mm]	[mm]	[mm]	[Nm]		
SKS10100CE	10	100	8	50	TX40	50



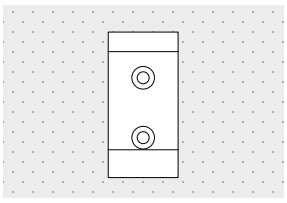
GEOMETRY | LOCK C Ø5

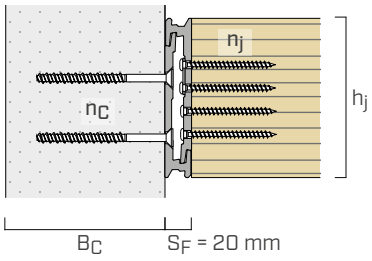


LOCK C CONNECTOR		CONCRETE		TIMBER		
		SKS-E anchors		LBS screws		
type	B x H x s [mm]	n_C - ØxL [mm]	$B_{C,min}$ [mm]	n_j - ØxL [mm]	$b_{J,min}$ x $h_{j,min}$ [mm]	
					with pre-drilling hole	without pre-drilling hole
LOCKC53120	52,5 x 120 x 20	2 - Ø8x100	120	12 - Ø5x50 12 - Ø5x70	70 x 120	78 x 120

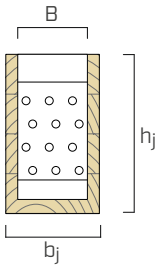
INSTALLATION | LOCK C Ø5

CONCRETE

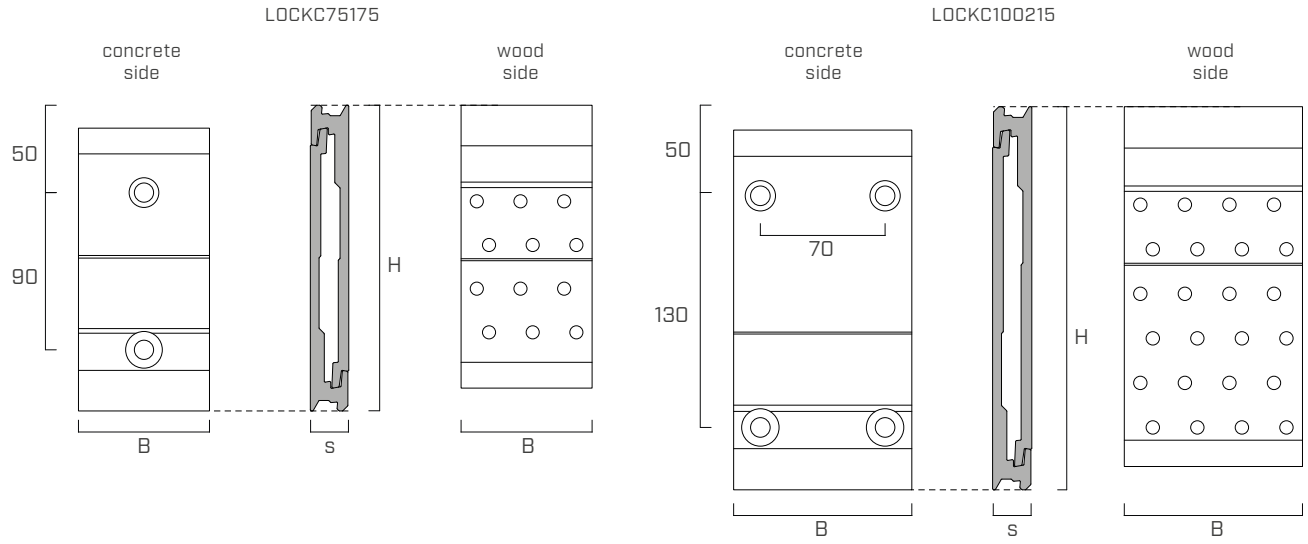




TIMBER

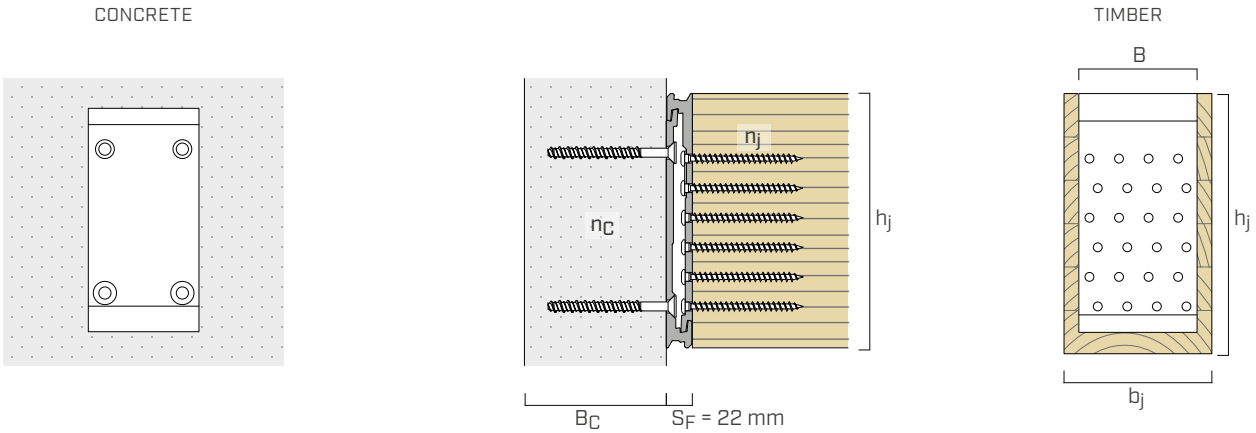


GEOMETRY | LOCK C Ø7

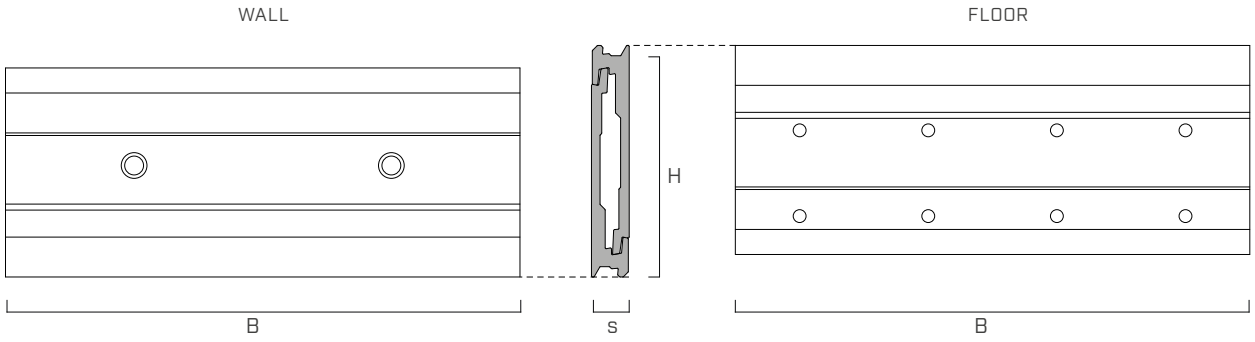


LOCK C CONNECTOR	CONCRETE		TIMBER		
		SKS-E anchors		LBS screws	
type	B x H x s [mm]	n_C - ØxL [mm]	$B_{C,min}$ [mm]	n_j - ØxL [mm]	$b_{J,min}$ x $h_{j,min}$ [mm] with pre-drilling hole	$b_{J,min}$ x $h_{j,min}$ [mm] without pre-drilling hole
LOCKC75175	75 x 175 x 22	2 - Ø10x100	120	12 - Ø7x80	99 x 175	105 x 175
LOCKC100215	100 x 215 x 22	4 - Ø10x100	120	24 - Ø7x80	124 x 215	130 x 215

INSTALLATION | LOCK C Ø7

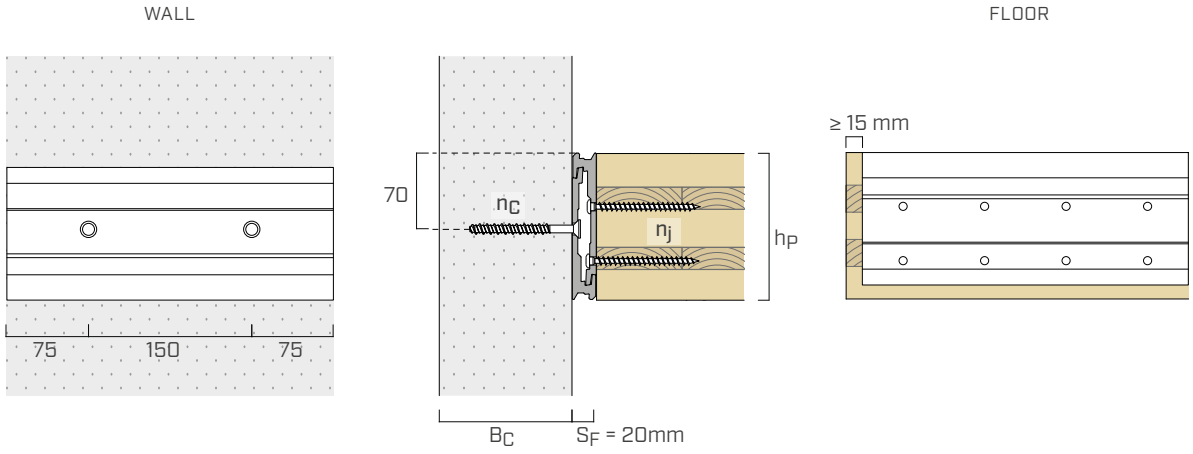


GEOMETRY| LOCK C FLOOR ON CLT



CONNECTOR LOCK T FLOOR			WALL		CLT FLOOR	
type	no. of modules[1]	B x H x s [mm]	SKS-E anchors n_C - ØxL [mm]	$B_{C,min}$ [mm]	LBS screws n_j - ØxL [mm]	$h_{p,min}$ [mm]
LOCKFLOOR135	1	300 x 135 x 22	2 - Ø10x100	120	8 - Ø7x80	135
LOCKFLOOR135	2	600 x 135 x 22	4 - Ø10x100	120	16 - Ø7x80	135
LOCKFLOOR135	3	900 x 135 x 22	6 - Ø10x100	120	24 - Ø7x80	135
LOCKFLOOR135	4	1200 x 135 x 22	8 - Ø10x100	120	32 - Ø7x80	135

INSTALLATION| LOCK C FLOOR ON CLT



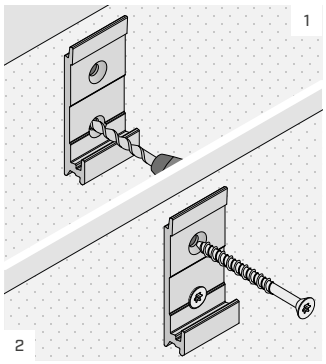
NOTES:

[1] The connector with 1200 mm length can be cut into modules with 300 mm width.

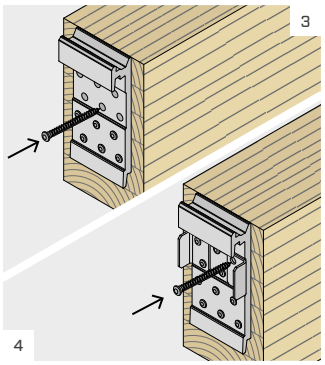
INSTALLATION

EXPOSED INSTALLATION WITH LOCK STOP

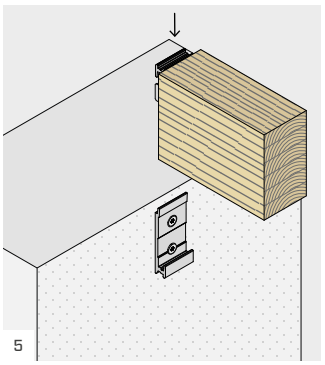
VIDEO

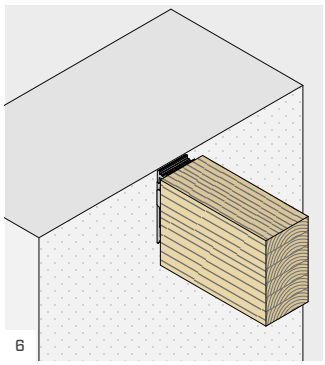


Place the connector on concrete and fasten the anchors according to the installation instructions.



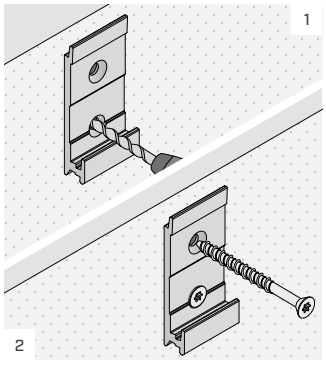
Place the connector on the wooden beam and fasten the first screws. When using LOCK STOP (optional) position LOCK STOP and fasten the remaining screws.



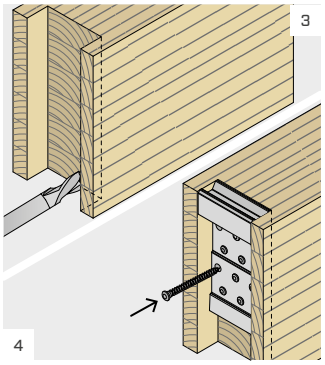


Hook the beam fitting it from the top to the bottom.

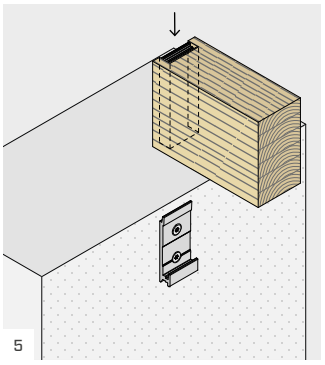
SEMI-CONCEALED INSTALLATION

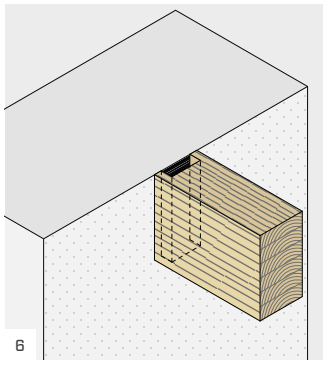


Place the connector on concrete and fasten the anchors according to the installation instructions.



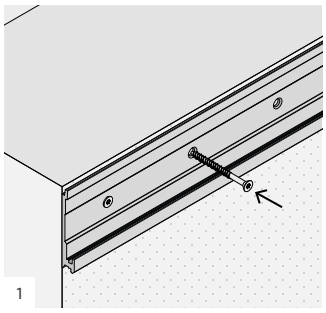
Perform full grooving on the secondary beam. Position the connector and fasten all screws.



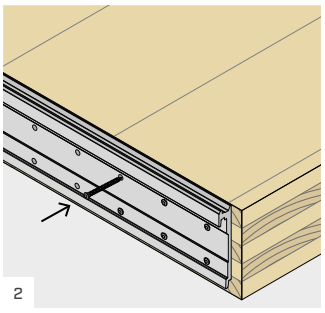


Hook the beam fitting it from the top to the bottom.

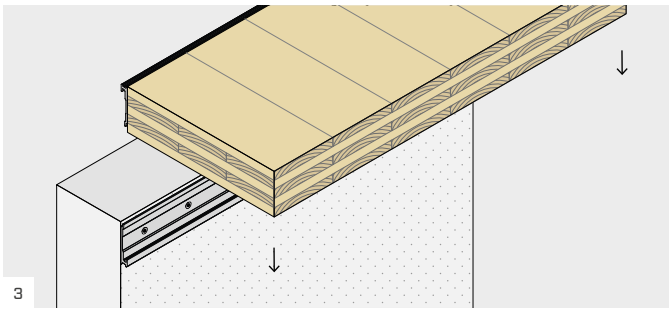
LOCK C FLOOR INSTALLATION



Place the connector on concrete and fasten the anchors according to the installation instructions.



Place the connector on the floor and fasten all screws.



Hook the beam fitting it from the top to the bottom.

STATIC VALUES

LOCK C Ø5

LOCK C CONNECTOR		TIMBER				ALUMINIUM	CONCRETE UNCRACKED	
type	B x H x s [mm]	LBS screws n_j - ØxL [mm]	$R_{v,timber,k}$ [kN] C24[2]	GL24h[3]	LVL[4]	$R_{v,alu,k}$ [kN]	SKS-E anchors n_C - ØxL [mm]	$R_{v,concrete,d}$ [kN]
LOCKC53120	52,5 x 120 x 20	12 - Ø5x50	13,96	15,22	15,50	30,0	2 - Ø8x100	12,10
		12 - Ø5x70	17,15	17,99	17,92			

LOCK C Ø7

LOCK C CONNECTOR		TIMBER				ALUMINIUM	CONCRETE UNCRACKED	
type	B x H x s [mm]	LBS screws n_j - ØxL [mm]	$R_{v,timber,k}$ [kN] C24[2]	GL24h[3]	LVL[4]	$R_{v,alu,k}$ [kN]	SKS-E anchors n_C - ØxL [mm]	$R_{v,concrete,d}$ [kN]
LOCKC75175	75 x 175 x 22	12 - Ø7x80	30,75	32,72	31,80	60,0	2 - Ø10x100	20,80
LOCKC100215	100 x 215 x 22	24 - Ø7x80	61,51	65,43	63,60	80,0	4 - Ø10x100	35,50

LOCK C FLOOR FOR CLT

LOCK C FLOOR CONNECTOR		TIMBER		ALUMINIUM	CONCRETE UNCRACKED	
type	B x H x s [mm]	LBS screws n_j - ØxL [mm]	$R_{v,timber,k}$ [kN] CLT[5]	$R_{v,alu,k}$ [kN]	SKS-E anchors n_C - ØxL [mm]	$R_{v,concrete,d}$ [kN]
LOCKCFLOOR135	300 x 135 x 22	8 - Ø7x80	20,40	240,0	2 - Ø10x100	24,60
LOCKCFLOOR135	600 x 135 x 22	16 - Ø7x80	40,79	480,0	4 - Ø10x100	47,90
LOCKCFLOOR135	900 x 135 x 22	24 - Ø7x80	61,19	720,0	6 - Ø10x100	71,10
LOCKCFLOOR135	1200 x 135 x 22	32 - Ø7x80	81,59	960,0	8 - Ø10x100	94,30

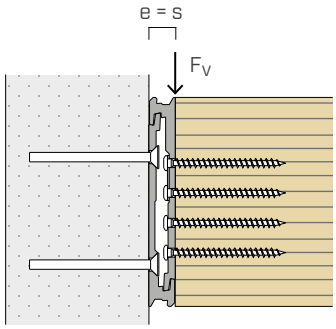
STATIC VALUES

DIMENSIONING OF ALTERNATIVE ANCHORS

For fastening by means of anchors other than those listed in the table, the calculation of the fasteners on concrete can be carried out with reference to the anchor ETA, following the diagram shown aside.

In the same way, for fastening on steel using countersunk head bolts, the calculation of the fasteners on steel can be carried out with reference to the regulations in force for the calculation of bolts in steel structures, following the diagram shown aside.

The group of anchors shall be tested for shear force and bending moment respectively equal to:



$$V_d = F_{v,d}$$

$$M_d = e \cdot F_{v,d}$$

CONNECTION STIFFNESS

The sliding module can be calculated according to ETA-19/0831, with the following expression:

$$K_{v,ser} = \frac{n \cdot \rho_m^{1,5} \cdot d^{0,8}}{30} \quad \frac{kN}{mm}$$

where:

- d is the diameter of the screw thread in the secondary beam, in mm;
- ρ_m is the average density of the secondary beam, in kg/m^3;
- n is the number of screws in the secondary beam.

NOTES:

(2) Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. ρ_k=350 kg/m^3 has been taken in consideration in the calculation.

(3) Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. ρ_k=385 kg/m^3 has been taken in consideration in the calculation.

(4) Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws with pre-drilling hole. ρ_k=480 kg/m^3 has been taken in consideration in the calculation.

(5) Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. ρ_k=350 kg/m^3 has been taken in consideration in the calculation.

GENERAL PRINCIPLES:

- The design values are obtained from the characteristic values as follows:
- The coefficient γ_{M2} is the partial coefficient for aluminium sections subject to tension, to be taken according to the current regulations used for the calculation. If there are no other provisions, it is suggested to use the value provided by EN 1999-1-1, equal to γ_{M2}=1.25.
- The coefficient γ_M the relevant safety coefficient, on the timber connection side, to be taken according to the current regulations used for the calculation.
- The design strength is obtained from the characteristic values as follows:

$$R_{v,d} = min \begin{cases} R_{v,timber,d} = \dfrac{R_{v,timber,k} \cdot k_{mod}}{\gamma_M} \\ R_{v,alu,d} = \dfrac{R_{v,alu,k}}{\gamma_{M2}} \\ R_{v,concrete,d} \end{cases}$$

- Dimensioning and verification of the timber beam must be carried out separately. In particular, for loads perpendicular to the beam axis, it is recommended to perform a splitting check.
- Screws with same length must be used in all the holes, with a total connector fastening , using all the holes.
- The pre-drill is not required for screws on beam, with characteristic density $\rho_k \leq 420$ kg/m^3. The pre-drill is mandatory on beams with characteristic density $\rho_k > 420$ kg/m^3.
- For the LOCKTFLOOR135 connector installed on CLT panels no pre-drilling hole is required.
- In the calculation phase, a strength class of C25/30 concrete with thin reinforcement was considered, in the absence of spacing and distances from the edge and minimum thickness indicated in the tables listing the installation parameters of the anchors used. The strength values are valid for the calculation hypotheses defined in the table; for boundary conditions different from those in the table (e.g. minimum distances from the edge or different concrete thickness), the concrete-side strength must be calculated separately (see the DIMENSIONING OF ALTERNATIVE ANCHORS section).