

LOCK T EVO TIMBER



OUTDOOR CONCEALED HOOK TIMBER-TO-TIMBER CONNECTOR

ALLUMINIO EVO

Thanks to the special painting it can be used outdoors in service class 3. Easy and quick to install, it can be fastened with a single type of screw.

OUTDOOR

The joint can be easily disassembled, ideal for the construction of temporary structures exposed to weather.

AGGRESSIVE WOODS

Ideal for applications with woods containing tannin or treated with impregnating agents and other chemical processes.



CHARACTERISTICS

FOCUS	outdoor joints that can be disassembled
TIMBER SECTIONS	from 53 x 80 mm to 160 x 280 mm
STRENGTH	$R_{v,k}$ up to 35 kN
FASTENERS	HBS PLATE EVO, KKF AISI410

VIDEO

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



MATERIAL

Aluminium alloy with special paint in graphite black colour.

FIELDS OF USE

Outdoor timber-to-timber shear joints

- solid timber and glulam
- CLT, LVL
- aggressive woods (containing tannin)
- chemically treated woods



SERVICE CLASS 3

The specially painted aluminium alloy together with the C4 EVO coated screws or martensitic stainless steel screws allow the joint to be used in service class 3.

OAK FRAME

Ideal for fastening aggressive woods containing tannin, such as chestnut and oak. Assembly with KKF AISI410 outdoor screws.

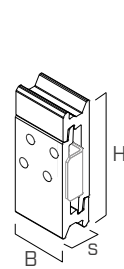
CODES AND DIMENSIONS

LOCK T EVO Ø5

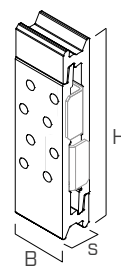
CODE	B [mm]	H [mm]	s [mm]	n _{screws} - Ø	n _{LOCKSTOP} - type	pcs *
LOCKTEVO3580	35	80	20	8 - Ø5	2 LOCKSTOP5	50
LOCKTEVO35120	35	120	20	16 - Ø5	4 LOCKSTOP5	25

Screws and LOCK STOP not included in the package.

* number of connector pairs



LOCKTEVO3580

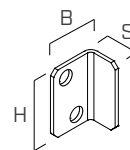


LOCKTEVO35120

LOCK STOP Ø5

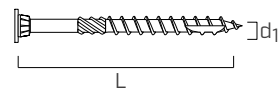
CODE	B [mm]	H [mm]	s [mm]	pcs
LOCKSTOP5	19	27,5	13	100

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



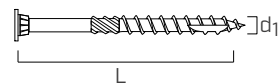
HBS PLATE EVO

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
HBSPEVO550	5	50	30	TX25	200
HBSPEVO570	5	70	40	TX25	100



KKF AISI410

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
KKF550	5	50	30	TX25	200
KKF570	5	70	40	TX25	100



MATERIAL AND DURABILITY

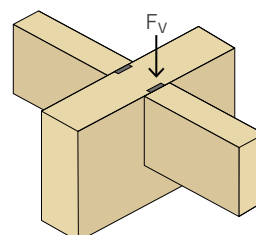
LOCK T EVO: EN AW-6005A aluminium alloy.

To be used in service classes 1, 2 and 3 (EN 1995-1-1).

FIELD OF USE

- Timber-to-timber joints between solid timber, glulam, LVL and CLT structural elements

EXTERNAL LOADS



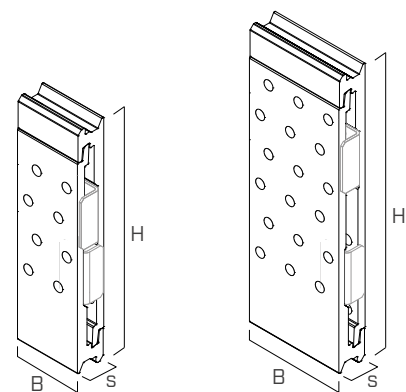
CODES AND DIMENSIONS

LOCK T EVO Ø6

CODE	B [mm]	H [mm]	s [mm]	n _{screws} - Ø	n _{LOCKSTOP} - type	pcs*
LOCKTEVO50175	50	175	22	16 - Ø6	4 LOCKSTOP 7	18
LOCKTEVO75215	75	215	22	36 - Ø6	4 LOCKSTOP 7	12

Screws and LOCK STOP not included in the package.

* number of connector pairs



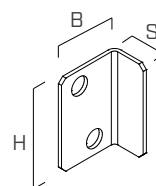
LOCKTEVO50175

LOCKTEVO75215

LOCK STOP Ø6

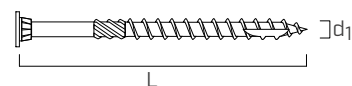
CODE	B [mm]	H [mm]	s [mm]	pcs
LOCKSTOP7	26,5	38	15	50

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



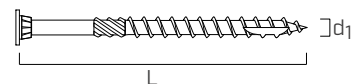
HBS PLATE EVO

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
HBSPEVO680	6	80	50	TX30	100



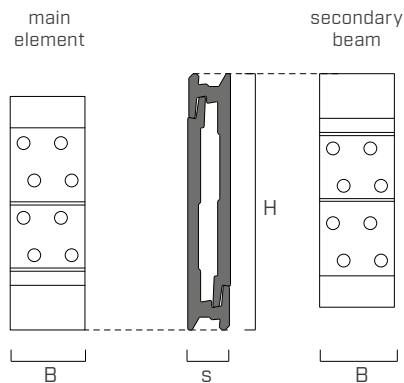
KKF AISI410

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
KKF680	6	80	50	TX30	100



PERGOLAS AND GAZEBOS

Ideal for the construction of wooden structures placed outdoors and in service class 3. Possibility to uninstall the joint for seasonal needs.



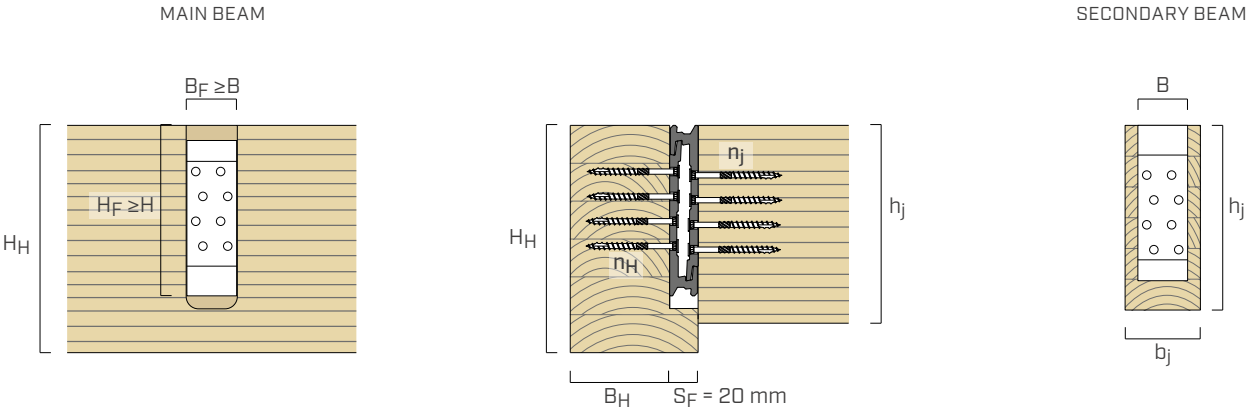
SINGLE CONNECTOR

LOCK T EVO CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	HBS PLATE EVO KKF AISI410 $n_H + n_J - \varnothing \times L$ [mm]	column $B_{S,min} \times H_{S,min}$ [mm] with pre-drilling hole	beam $B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	$b_{J,min} \times h_{j,min}$ [mm] with pre-drilling hole without pre-drilling hole	
LOCKTEVO3580	35 x 80 x 20	4+4 - Ø5x50 4+4 - Ø5x70	53 x 50 53 x 70	50 x 95 70 x 95	53 x 80	61 x 80
LOCKTEVO35120	35 x 120 x 20	8+8 - Ø5x50 8+8 - Ø5x70	53 x 50 53 x 70	50 x 135 70 x 135	53 x 120	61 x 120

COUPLED CONNECTORS

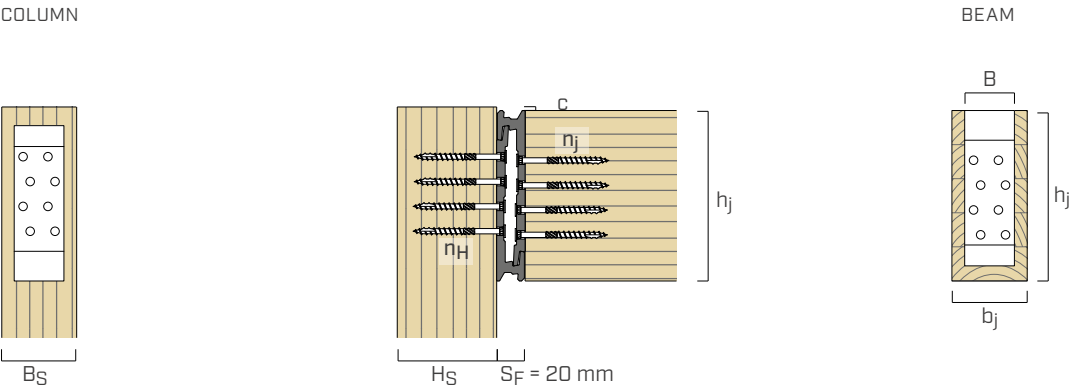
LOCK T EVO CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	HBS PLATE EVO KKF AISI410 $n_H + n_J - \varnothing \times L$ [mm]	column $B_{S,min} \times H_{S,min}$ [mm] with pre-drilling hole	beam $B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	$b_{J,min} \times h_{j,min}$ [mm] with pre-drilling hole without pre-drilling hole	
LOCKTEVO 35120 + 35120	70 x 120 x 20	16+16 - Ø5x50 16+16 - Ø5x70	88 x 50 88 x 70	50 x 135 70 x 135	88 x 120	96 x 120

■ INSTALLATION ON BEAM | LOCK T EVO Ø5



The H_F dimension refers to the minimum height of the grooving at constant width. The rounded part must be taken into account when grooving.

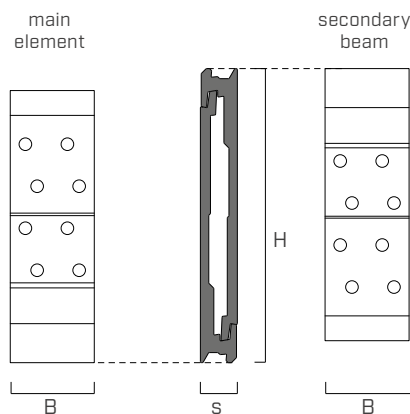
■ INSTALLATION ON COLUMN | LOCK T EVO Ø5



■ CONNECTOR POSITIONING | LOCK T EVO Ø5

connector	c_{min} [mm]
LOCKTEVO3580	7,5
LOCKTEVO35120	2,5

For installation on column, respecting the minimum distance of the screw from the unloaded end of the column, requires to lower the connector by a quantity c , compared to the end of the column. This can be achieved either by raising the column with respect to the top of the beam (as in the image) or by lowering the connector with respect to the top of the beam by a c amount.



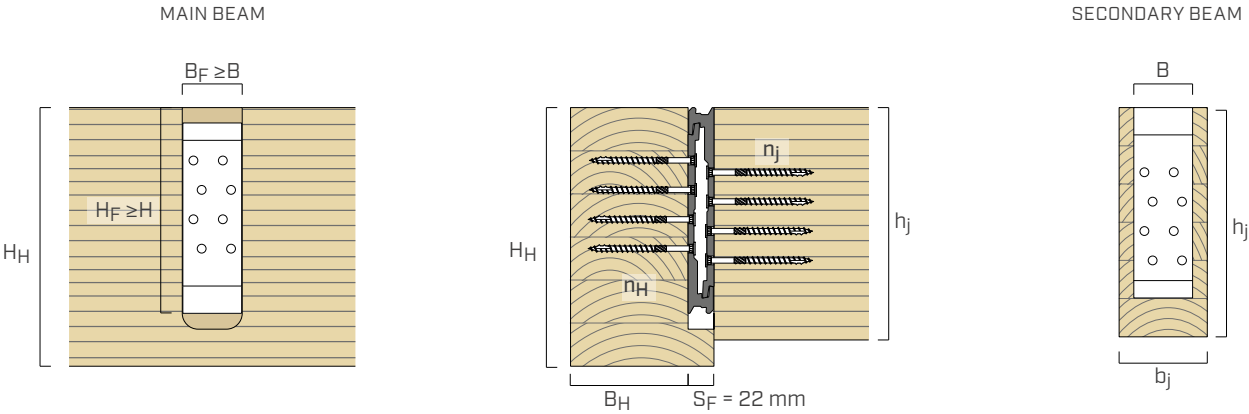
SINGLE CONNECTOR

LOCK T EVO CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	HBS PLATE EVO KKF AISI410 $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{J,min} \times h_{j,min}$ [mm]	
			$B_{S,min} \times H_{S,min}$ [mm]	$B_{H,min} \times H_{H,min}$ [mm]	with pre-drilling hole	without pre-drilling hole
			with pre-drilling hole	without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKTEVO50175	50 x 175 x 22	8+8 - Ø6x80	68 x 80	80 x 180	68 x 175	80 x 175
LOCKTEVO75215	75 x 215 x 22	18+18 - Ø6x80	93 x 80	80 x 220	93 x 215	105 x 215

COUPLED CONNECTORS

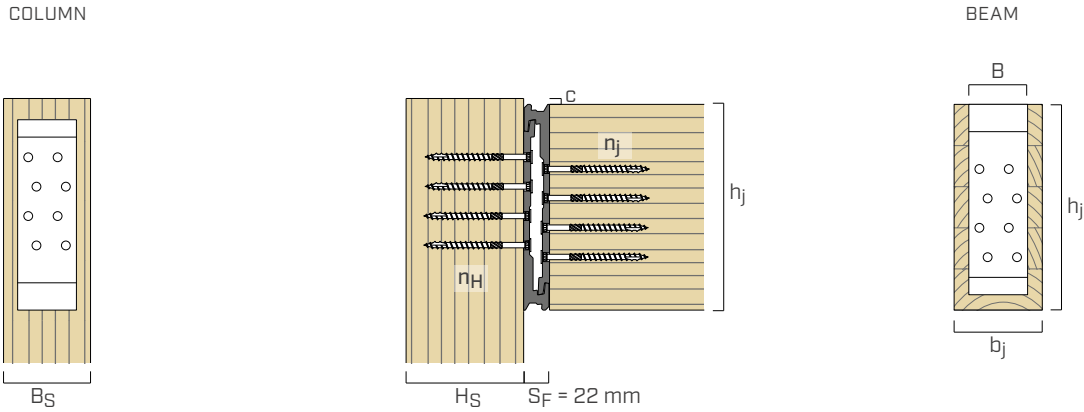
LOCK T EVO CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	HBS PLATE EVO KKF AISI410 $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{J,min} \times h_{j,min}$ [mm]	
			$B_{S,min} \times H_{S,min}$ [mm]	$B_{H,min} \times H_{H,min}$ [mm]	with pre-drilling hole	without pre-drilling hole
			with pre-drilling hole	without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKTEVO 50175 + 50175	100 x 175 x 22	16+16 - Ø6x80	118 x 80	80 x 180	118 x 175	130 x 175
LOCKTEVO 75215 + 75215	150 x 215 x 22	36+36 - Ø6x80	168 x 80	80 x 220	168 x 215	180 x 215

■ INSTALLATION ON BEAM | LOCK T EVO Ø6



The H_F dimension refers to the minimum height of the grooving at constant width. The rounded part must be taken into account when grooving.

■ INSTALLATION ON COLUMN | LOCK T EVO Ø6



■ CONNECTOR POSITIONING | LOCK T EVO Ø6

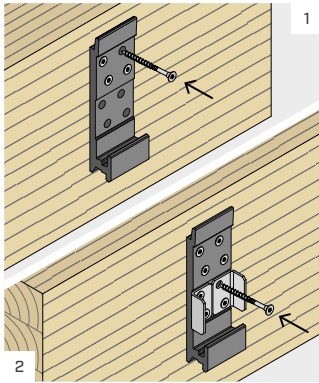
connector	c_{min} [mm]
LOCKTEVO50175	5
LOCKTEVO75215	15

For installation on column, respecting the minimum distance of the screw from the unloaded end of the column, requires to lower the connector by a quantity c , compared to the end of the column. This can be achieved either by raising the column with respect to the top of the beam (as in the image) or by lowering the connector with respect to the top of the beam by a c amount.

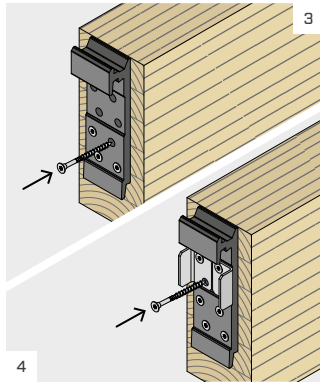
INSTALLATION



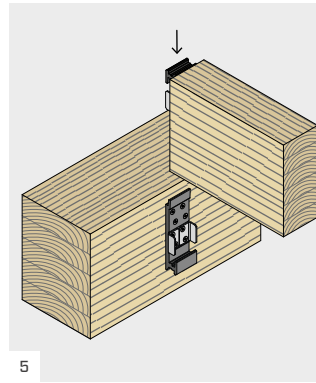
EXPOSED INSTALLATION WITH LOCK STOP



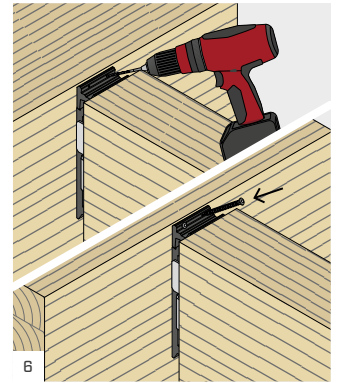
Place the connector on the main element and fasten the first screws. When using LOCK STOP (optional) position LOCK STOP and fasten the remaining screws.



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

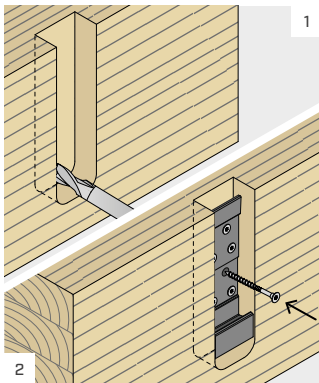


Hook the secondary beam fitting it from the top to the bottom.

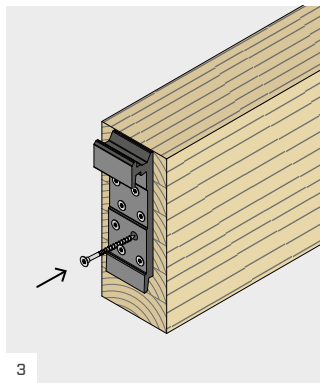


It is possible to insert anti-slip screws without structural function, by drilling one hole Ø5 inclined at 45° in the upper part of the connector. A Ø5 screw must be inserted in the hole.

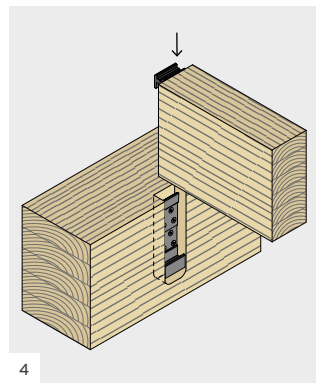
CONCEALED INSTALLATION



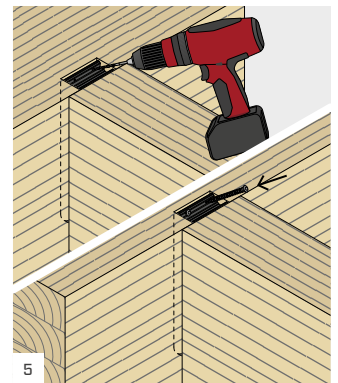
Carry out the grooving on the main element. Place the connector on the main element and fasten all screws.



Place the connector on the secondary beam and fasten all screws.

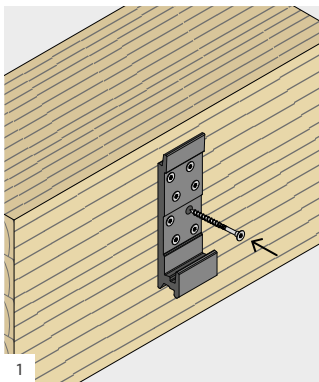


Hook the secondary beam fitting it from the top to the bottom.

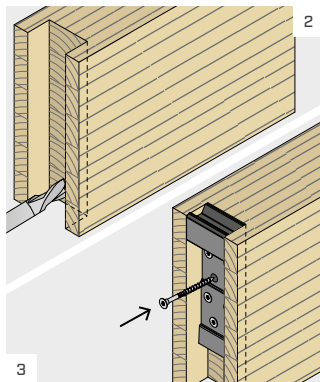


It is possible to insert anti-slip screws without structural function, by drilling one or more holes Ø5 inclined at 45° in the upper part of the connector. A Ø5 screw must be inserted in the holes.

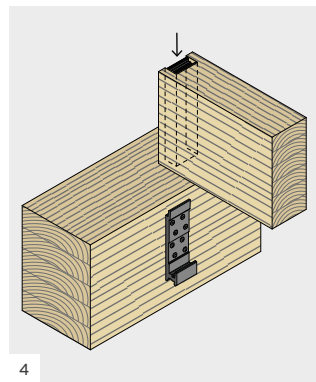
SEMI-CONCEALED INSTALLATION



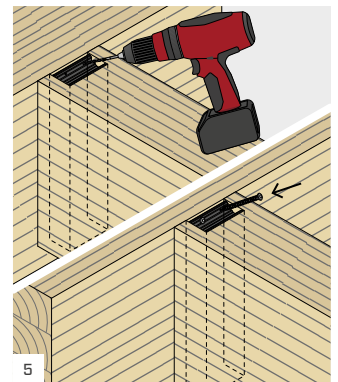
Place the connector on the main element and fasten all screws.



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



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



It is possible to insert anti-slip screws without structural function, by drilling one or more holes Ø5 inclined at 45° in the upper part of the connector. A Ø5 screw must be inserted in the holes.

NOTE: for the geometry of the holes for the optional inclined screws see the "OPTIONAL INCLINED SCREWS" page 70.

■ STATIC VALUES

LOCK T EVO Ø5

LOCK T EVO CONNECTOR		TIMBER			ALUMINIUM
type	B x H x s [mm]	HBS PLATE EVO screws KKF AISI410 n _H +n _j - ØxL [mm]	R _{v,timber,k} [kN]		R _{v,alu,k} [kN]
			C24 ⁽¹⁾	C50 ⁽²⁾	
LOCKTEVO3580	35 x 80 x 20	4+4 - Ø5x50 4+4 - Ø5x70	3,97 4,81	5,66 6,23	20,0
LOCKTEVO35120	35 x 120 x 20	8+8 - Ø5x50 8+8 - Ø5x70	7,94 9,62	11,31 12,46	20,0
LOCKTEVO 35120 + 35120	70 x 120 x 20	16+16 - Ø5x50 16+16 - Ø5x70	15,88 19,23	22,62 24,92	40,0

LOCK T EVO Ø6

LOCK T EVO CONNECTOR		TIMBER			ALUMINIUM
type	B x H x s [mm]	HBS PLATE EVO screws KKF AISI410 n _H +n _j - ØxL [mm]	R _{v,timber,k} [kN]		R _{v,alu,k} [kN]
			C24 ⁽¹⁾	C50 ⁽²⁾	
LOCKTEVO50175	50 x 175 x 22	8+8 - Ø6x80	13,92	18,24	40,0
LOCKTEVO75215	75 x 215 x 22	18+18 - Ø6x80	31,31	41,04	60,0
LOCKTEVO 50175 + 50175	100 x 175 x 22	16+16 - Ø6x80	27,83	36,48	80,0
LOCKTEVO 75215 + 75215	150 x 215 x 22	36+36 - Ø6x80	62,62	82,07	120,0

CONNECTION STIFFNESS:

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

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

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/m³;

n is the number of screws in the secondary beam.

NOTES:

⁽¹⁾ 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/m³ has been taken in consideration in the calculation.

⁽²⁾ Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws with pre-drilling hole. ρ_k=430 kg/m³ 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:

$$R_{v,d} = \min \left\{ \begin{array}{l} R_{v,timber,d} = \frac{R_{v,timber,k} \cdot k_{mod}}{\gamma_M} \\ R_{v,alu,d} = \frac{R_{v,alu,k}}{\gamma_{M2}} \end{array} \right.$$

- Dimensioning and verification of the timber elements must be carried out separately. In particular, for loads perpendicular to the beam axis, it is recommended to perform a splitting check in both wooden elements.
- If coupled connectors are used, special care must be taken in alignment during installation to avoid different stresses in the two connectors.
- Screws with the same length must be used in all holes, separately for each side of the connector. It is possible to use screws of different length in the two connectors, main element side and secondary beam side.
- The connector must always be fully fastened using all the holes.
- The pre-drill is not required for screws on main or secondary beam, with characteristic density ρ_k≤420 kg/m³. The pre-drill is mandatory on main or secondary beam with characteristic density ρ_k> 420 kg/m³.
- For screws on column, pre-drilling is always mandatory.