CTC

ELC-4645 ESR-4645 ETA-11/0030

CONNECTOR FOR TIMBER-TO-CONCRETE FLOORS

CERTIFICATION

Timber-to-concrete fastener with specific CE certification according to ETA-19/0244. Structural connector approved according to ICC ELC-4645 listing report in Canada. Structural connector approved according to ICC ELC-4645 listing report in Canada. Tested and calculated with parallel and crossed arrangement of 45° and 30° connectors, with and without wooden planking.

RAPID DRY SYSTEM

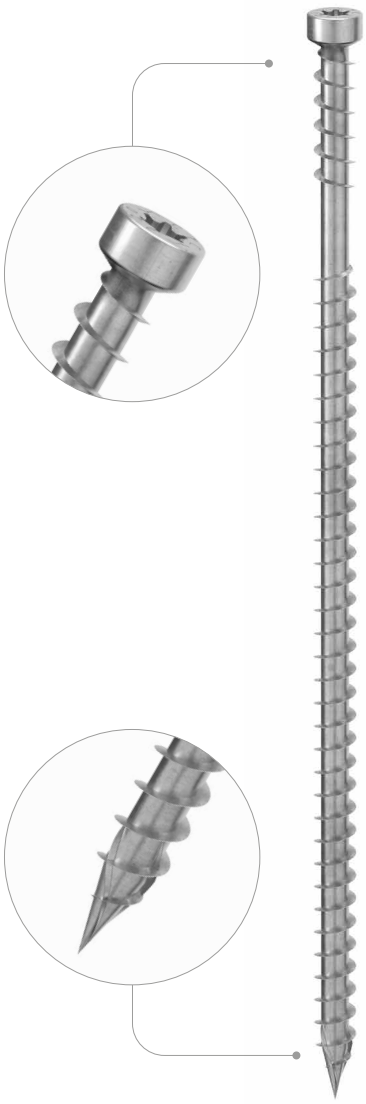
Approved system, self-drilling, reversible, fast and minimally invasive. Optimum static and noise performances, both for new projects and structural restoration.

COMPLETE RANGE

Self-perforating tip with notch and countersunk cylindrical head. Available in two diameters (7 and 9 mm) and two lengths (160 and 240 mm) to optimize the number of fasteners.

INSTALLATION INDICATOR

During installation, the under head counter-thread serves as "correct installation" indicator and increases the fastener tightness inside the concrete.



BIT INCLUDED

DIAMETER [mm]	6 — **7** **9** — 16
LENGTH [mm]	52 — **160** **240** — 400
SERVICE CONDITION	EC1 DRY
ATMOSPHERIC CORROSIVITY	C1 C2
WOOD CORROSIVITY	T1 T2
MATERIAL	Zn ELECTRO PLATED — electrogalvanized carbon steel
CORE HARDNESS	<390 HV — as required in CSA 086:24(1)

CANADIAN DESIGN VALUES

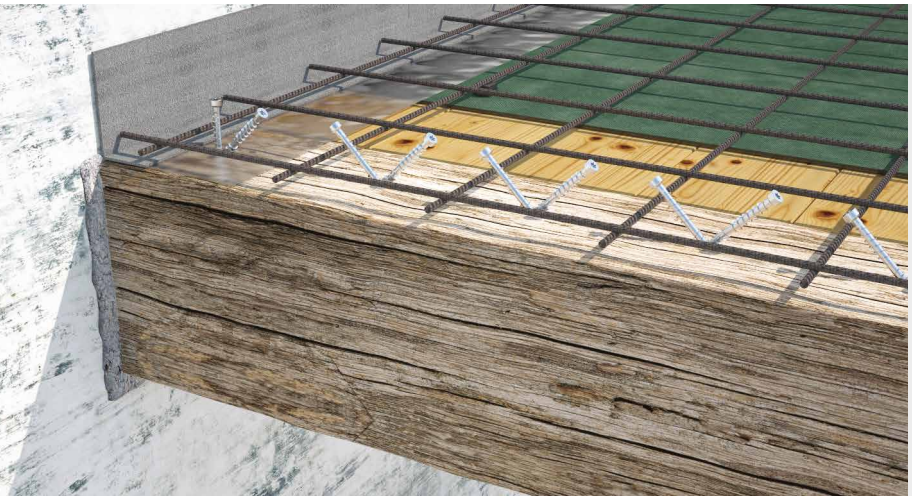
USA, EU and more design values available online.



FIELDS OF USE

- timber based panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT and LVL
- high density woods
- concrete EN 206-1
- lightweight concrete EN 206-1
- lightened concrete based on silicates

(1) Core hardness < 390 HV guaranteed for structural timber screws diameter 6 mm and above.

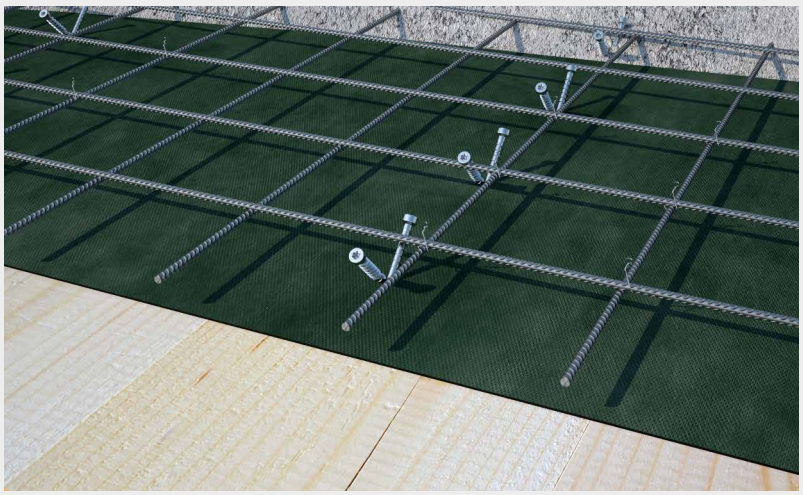


TIMBER-TO-CONCRETE

Ideal for composite floors and for renovation of existing floors. Stiffness values also calculated in the presence of vapour barrier sheet or soundproofing layer.

STRUCTURAL RESTORATION

Values also tested, certified and calculated for high density woods. Certification specific for application in timber-concrete structures.

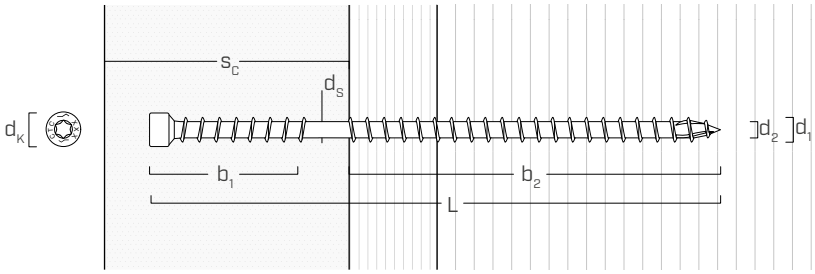


Composite timber-concrete floors on CLT panel with 45° connectors arranged in a single row.



Composite timber-concrete floors with 30° connectors arranged in a double row.

GEOMETRY AND MECHANICAL CHARACTERISTICS



GEOMETRY

Nominal diameter	**d_1**	**[mm]**	**7**	**9**
Head diameter	d_K	[mm]	9,50	11,50
Root diameter	d_2	[mm]	4,60	5,90
Shank diameter	d_S	[mm]	5,00	6,50
Pre-drilling hole diameter(1)	$d_{V,S}$	[mm]	4,0	5,0

(1) Pre-drilling valid for softwood.

MECHANICAL PROPERTIES

Nominal diameter	**d_1**	**[mm]**		**7**	**9**
Factored tensile strength	Φf_u	[kN]		12,72	20,97
Bending yield strength	F_{yb}	[MPa]		1111	1069
Factored shear strength of the screw	Φv_s	[kN]		6,38	10,50
Specified withdrawal resistance per millimeter of threaded shank (tip included)	Y_w	[N/mm]	G=0.35	61,10	78,56
			G=0.42	70,70	90,90
			G=0.49	79,98	102,83
			G=0.55	87,75	112,79

The mechanical parameters are obtained analitically and validated by experimental tests.

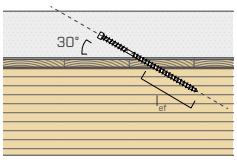
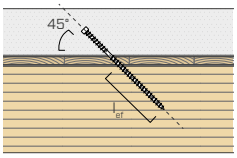
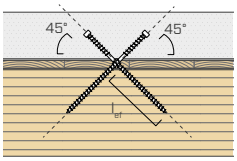
CODES AND DIMENSIONS

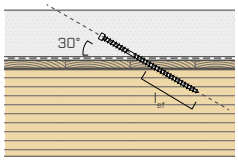
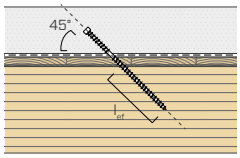
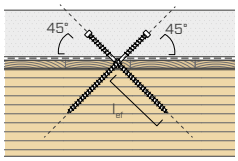
d_1 [mm]	CODE	L [mm]	b_1 [mm]	b_2 [mm]	pcs
7 TX 30	CTC7160	160	40	110	100
	CTC7240	240	40	190	100

d_1 [mm]	CODE	L [mm]	b_1 [mm]	b_2 [mm]	pcs
9 TX 40	CTC9160	160	40	110	100
	CTC9240	240	40	190	100

SLIP MODULUS K_{ser}

The K_{ser} slip modulus is to be understood as relating to a single connector or a pair of crossed connectors subject to a parallel force at the slip surface.

connector arrangement without soundproofing layer	K_{ser} [N/mm]	
	CTC Ø7	CTC Ø9
 parallel at a 30°	80 l_{ef}	80 l_{ef}
 45° parallels	48 l_{ef}	60 l_{ef}
 45° crossed	70 l_{ef}	100 l_{ef}

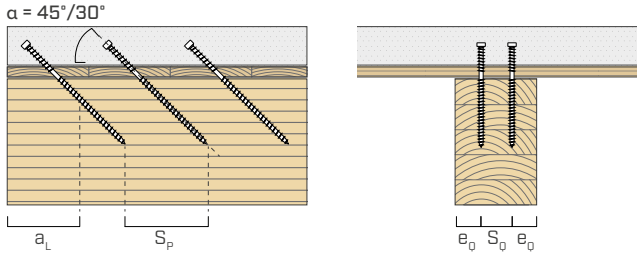
connector arrangement with soundproofing layer	K_{ser} [N/mm]	
	CTC Ø7	CTC Ø9
 parallel at a 30°	48 l_{ef}	48 l_{ef}
 45° parallels	16 l_{ef}	22 l_{ef}
 45° crossed	70 l_{ef}	100 l_{ef}

l_{ef} = depth of CTC connector pull-through into timber element, in millimetres.
Soundproofing foil is defined as a resilient underscreed foil, in bitumen and polyester felt, like SILENT FLOOR.

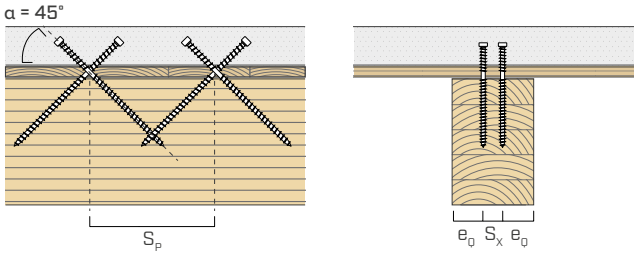
MINIMUM DISTANCES FOR AXIALLY LOADED CONNECTORS

d_1	[mm]	7	9
S_p	[mm]	130·sin(α)	130·sin(α)
S_q	[mm]	35	45
a_L	[mm]	85	85
e_Q	[mm]	32	37
S_X	[mm]	11	14

α = angle between connector and grain



parallel at 30°/45°



45° crossed

NOTES

- The minimum distances and the slip modulus K_{ser} are based on an experimental testing campaign, with the results documented in European Technical Assessment ETA-19/0244.