LBB

PERFORATED STRAP

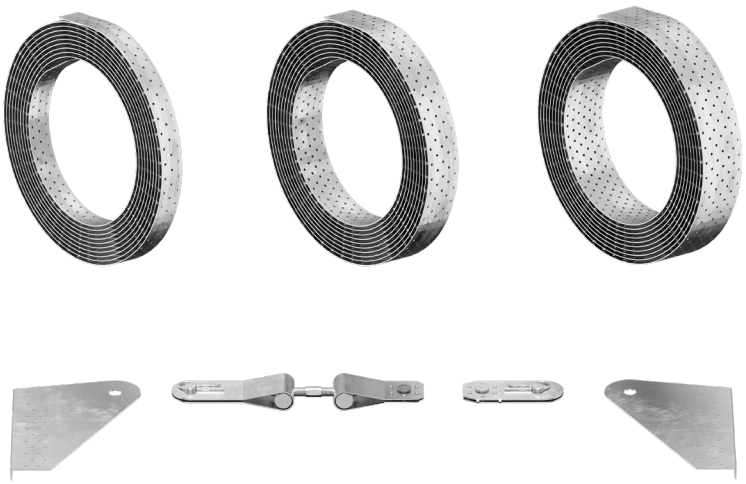
CE
EN 14545

TWO THICKNESSES
Simple and effective system to achieve floor bracing. It is available in thicknesses of 1,5 and 3,0 mm.

SPECIAL STEEL
Made with S350GD high strength steel. The 1,5 mm thick version offers extreme performance to tensile forces with minimal thickness.

TENSIONING
The CLIPFIX60 accessory allows the strap to be tensioned and anchored firmly at the ends. By using a GEKO or SKORPIO panel pullers together with the CLAMP1 accessory, the perforated strap can be tensioned.

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



SERVICE CONDITION

DRY

MATERIAL

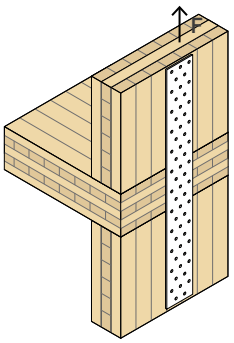
S350 Z275 **LBB 1,5 mm**: S350GD + Z275 carbon steel

S250 Z275 **LBB 3,0 mm**: S250GD + Z275 carbon steel

THICKNESS [mm]

1,5 mm | 3,0 mm

EXTERNAL LOADS



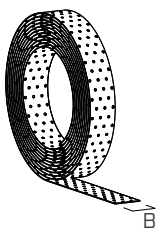
FIELD OF USE

Economical solution for tensile joints with small to medium stress.
Rolls of 25 or 50 m allow for very long connections.
Timber-to-timber configuration.

Can be applied to:
- solid timber and glulam
- timber frame
- CLT and LVL panels

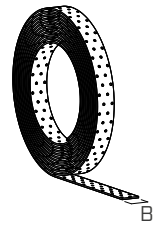
CODES AND DIMENSIONS

LBB 1,5 mm



CODE	B [mm]	H [m]	s [mm]	*B [in]*	*H [in]*	*s [in]*	n Ø5 *n Ø.20* [pcs]		pcs
LBB40	40	50	1,5	*1 9/16*	*1 15/16*	*0.06*	75/m *23 / ft.*	●	1
LBB60	60	50	1,5	*2 3/8*	*1 15/16*	*0.06*	125/m *38 / ft.*	●	1
LBB80	80	25	1,5	*3 1/8*	*1 15/16*	*0.06*	175/m *53 / ft.*	●	1

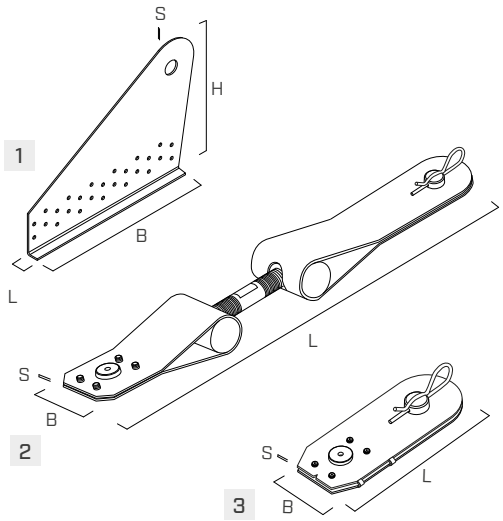
LBB 3,0 mm



CODE	B [mm]	H [m]	s [mm]	*B [in]*	*H [in]*	*s [in]*	n Ø5 *n Ø.20* [pcs]		pcs
LBB4030	40	50	3	*1 9/16*	*1 15/16*	*0.12*	75/m *23 / ft.*	●	1

CLIPFIX

CODE	LBB type	LBB width	pcs
CLIPFIX60	LBB40 | LBB60	40 mm | 60 mm *1 9/16 in | 2 3/8 in*	1



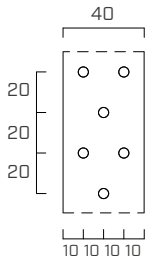
SET COMPRISED OF:		B [mm] *[in]*	H [mm] *[in]*	L [mm] *[in]*	s [mm] *[in]*	n Ø5 *n Ø.20* pcs	pcs
1	Terminal plate	289 *11 3/8*	198 *7 13/16*	15 *9/16*	2 *0.08*	26	4(1)
2	Clip-Fix tensioner	60 *2 3/8*	-	300-350 *11 3/4 - 13 3/4*	2 *0.08*	7	2
3	Clip-Fix Terminal	60 *2 3/8*	-	157 *6 3/16*	2 *0.08*	7	2

(1)The set includes two right-hand and two left-hand plates.

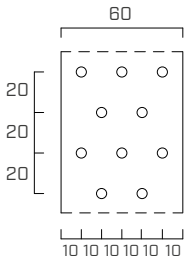
The Clip-Fix tensioners and terminals are compatible for installation of the LBB40 and LBB60 perforated straps.

GEOMETRY

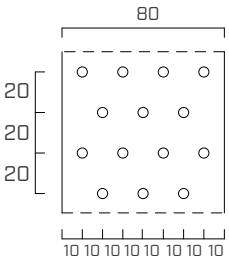
LBB40 / LBB4030



LBB60



LBB80



FASTENERS

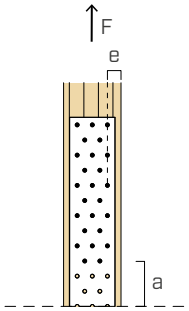
type	description		d [mm]	support	page
LBA	high bond nail		4		570
LBS	round head screw		5		571
LBS EVO	C4 EVO round head screw		5		571

INSTALLATION

MINIMUM DISTANCES

Spruce-Pine-Fir and Northern Species			nail LBA Ø4	screw LBS Ø5
edge distance perpendicular to grain	**e**	[mm]	≥ 16	≥ 20
end distance parallel to grain	**a**	[mm]	≥ 48	≥ 60

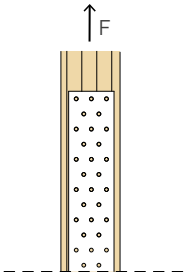
Douglas Fir-Larch, Hem-Fir, and Western Red Cedar			nail LBA Ø4	screw LBS Ø5
edge distance perpendicular to grain	**e**	[mm]	≥ 20	≥ 25
end distance parallel to grain	**a**	[mm]	≥ 60	≥ 75



STRUCTURAL VALUES | TIMBER-TO-TIMBER | F

STRENGTH OF THE SYSTEM

The tensile strength of the system (T_r) is the minimum between the $T_{r,steel}$ plate side tensile strength and the shear resistance of the connectors used for fastening $n_F \cdot N_r$.
If the connectors are placed in several consecutive rows and the load direction is parallel to the grain, the following design criteria must be applied.



$$T_r = min \begin{cases} T_{r,steel} \\ \Sigma (n_{Ri} \cdot n_{ci} \cdot N_r) \end{cases}$$

Where n_{Ri} is the number of fastener rows parallel to the grain, and n_{ci} is the number of fasteners in each row.

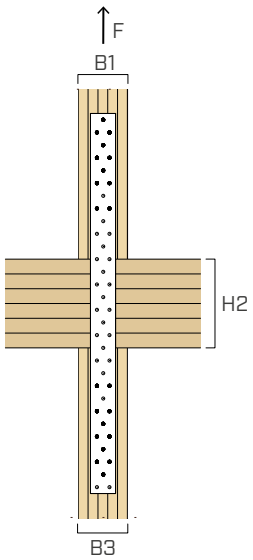
PLATE - TENSILE STRENGTH

type	B	s	net area holes	factored tensile resistance $T_{r,steel}$
	[mm]	[mm]	[pcs]	[kN]
LBB 1,5 mm	40	1,5	2	**9,2**
	60	1,5	3	**15,7**
	80	1,5	4	**20,9**
LBB 3,0 mm	40	3,0	2	**14,5**

CONNECTORS SHEAR RESISTANCE

For other N_r strength values of the LBA Anker nails and LBS screws, please refer to the "TIMBER SCREWS AND DECK FASTENING" catalogue and the Canadian technical datasheets.

CALCULATION EXAMPLE | DETERMINING RESISTANCE



Project data		
Factored tension force	T_f	8 kN
Service-condition		Dry service condition
Load duration		short[1]
Sawn Lumber (D.Fir)	G	0,49[2]
Element 1	B1	89 mm
Element 2	H2	140 mm
Element 3	B3	89 mm

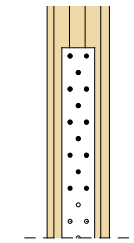
perforated strap LBB40
B = 40 mm
s = 1,5 mm

Anker nail LBA440[4]
d_1 = 4,0 mm
L = 40 mm

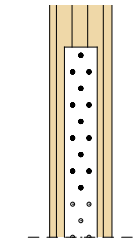
perforated plate LBV401200[3]
B = 40 mm
s = 2,0 mm
H = 600 mm

Anker nail LBA440[4]
d_1 = 4,0 mm
L = 40 mm

EVALUATION OF THE STRENGTH OF THE SYSTEM



perforated strap LBB40



perforated plate LBV401200

PLATE - TENSILE STRENGTH

perforated strap LBB40			
$T_{r,steel}$	=	9,2	kN

perforated plate LBV401200[3]			
$T_{r,steel}$	=	9,7	kN

CONNECTOR - LATERAL RESISTANCE

perforated strap LBB40			
φ	=	0,8	
N_u	=	1,8	kN
n_s	=	1,0	shear planes
K_D	=	1,15	
J_F	=	1,0	
N_r	=	1,63	kN
n_F	=	14	fasteners
n_{c1}	=	5	fasteners
n_{R1}	=	2	rows
n_{c2}	=	4	fasteners
n_{R2}	=	1	rows
$\sum (n_{Ri} \cdot n_{ci} \cdot N_r)$	=	**22,8**	**kN**

perforated plate LBV401200[3]			
φ	=	0,8	
N_u	=	1,8	kN
n_s	=	1,0	shear planes
K_D	=	1,15	
J_F	=	1,0	
N_r	=	1,63	kN
n_F	=	13	fasteners
n_{c1}	=	4	fasteners
n_{R1}	=	2	rows
n_{c2}	=	5	fasteners
n_{R2}	=	1	rows
$\sum (n_{Ri} \cdot n_{ci} \cdot N_r)$	=	**21,2**	**kN**

STRENGTH OF THE SYSTEM

$$T_r = min \begin{cases} T_{r,steel} \\ \sum (n_{Ri} \cdot n_{ci} \cdot N_r) \end{cases}$$

perforated strap LBB40			
T_r	=	9,2	kN

perforated plate LBV401200[3]			
T_r	=	9,7	kN

VERIFICATION	$T_r \geq T_f$	9,2 kN	≥	8,0	kN	✓
		verification passed				

VERIFICATION	$T_r \geq T_f$	9,7 kN	≥	8,0	kN	✓
		verification passed				

NOTES

(1) For short term loading, a load duration factor K_D of 1.15 was applied.
(2) G represents the mean relative density as specified in CSA-O86:2024, Table A.12. In the design example, Douglas Fir (G=0.49) has been considered.
(3) Plate LBV401200 is considered cut to a length of 600 mm.
(4) In the calculation example, LBA Anker nails are used. The fastening can also be done with LBS screws.

GENERAL PRINCIPLES

- The LBB 1.5 mm is assumed to have a minimum specified yield strength (F_y) of 350 MPa and a minimum specified tensile strength (F_u) of 420 MPa.
- The LBB 3 mm is assumed to have a minimum specified yield strength (F_y) of 250 MPa and a minimum specified tensile strength (F_u) of 330 MPa.
- The factored tensile resistance of the steel is determined based on the tensile capacity of the governing net area of the steel plate.
- Minimum distances as per CSA-O86 2024 Clause 12.9.2.1.
- Dimensioning and verification of the timber elements must be carried out separately.
- To optimize the connection system, it is recommended to use a number of connectors which can provide a shear capacity that does not exceed the tensile strength of the tape/plate.
- It is recommended to place the connectors symmetrically with respect to the load direction.