LBB

PERFORATED STRAP

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.

USA, Canada and more design values available online.
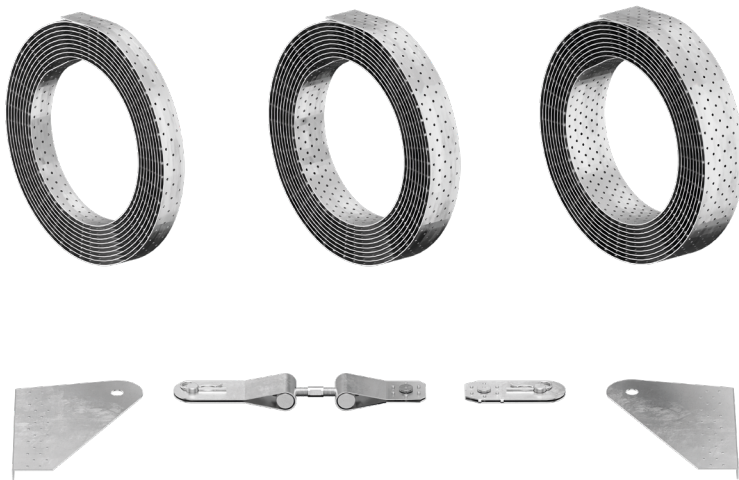
SERVICE CLASS

SC1 SC2

MATERIAL

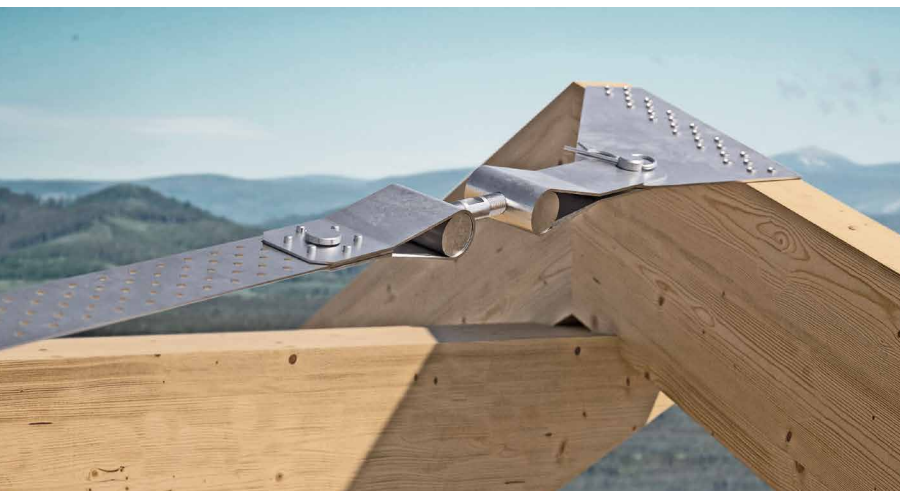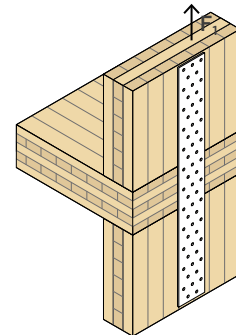S350 Z275 **LBB 1, 5 mm**: S350GD + Z275 carbon steel

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.
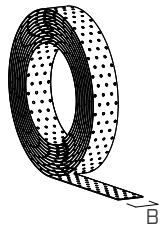Timber-to-timber configuration.

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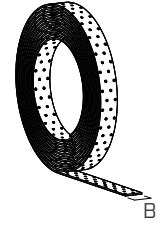
CODES AND DIMENSIONS

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.
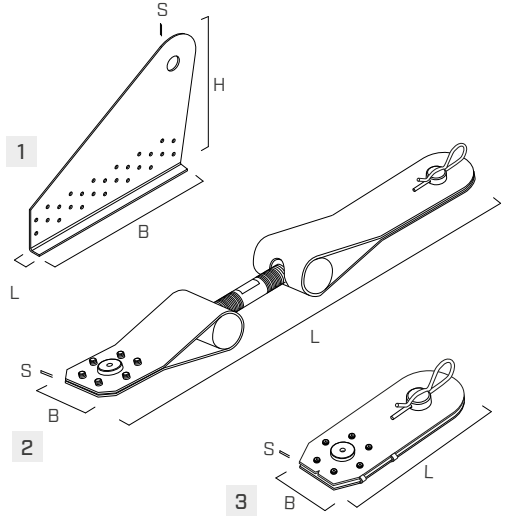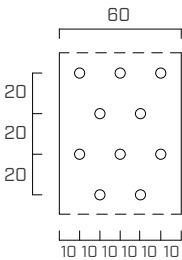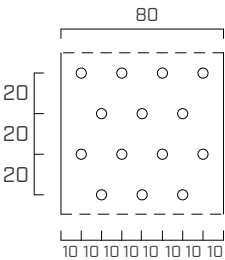
GEOMETRY

LBB40 / LBB4030
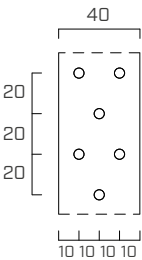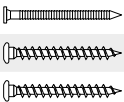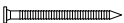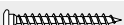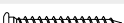
LBB60

LBB80

FASTENERS

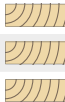| type	description		d [mm]	support	page
LBA	high bond nail		4		570
LBS	round head screw		5		571
LBS EVO	C4 EVO round head screw		5		571

■ INSTALLATION

MINIMUM DISTANCES

TIMBER minimum distances			nails LBA Ø4	screws LBS Ø5
Lateral connector - unloaded edge	$a_{4,c}$	[mm]	≥ 20	≥ 25
Connector - loaded end	$a_{3,t}$	[mm]	≥ 60	≥ 75
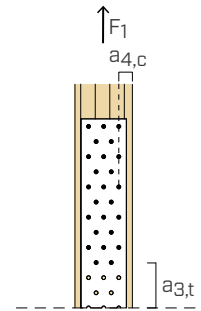
■ STRUCTURAL VALUES | TIMBER-TO-TIMBER | F_1

STRENGTH OF THE SYSTEM

The tensile strength of the R1,d system is the minimum between the Rax,d plate side tensile strength and the shear resistance of the connectors used for fastening n_{tot} $R_{v,d}$.
If the connectors are placed in several consecutive rows and the load direction is parallel to the grain, the following sizing criteria must be applied.

$$R_{1,d} = min \begin{cases} R_{ax,d} \\ \sum m_i \cdot n_i^k \cdot R_{v,d} \end{cases} \quad k = \begin{cases} 0,85 & LBA \quad \emptyset = 4 \\ 0,75 & LBS \quad \emptyset = 5 \end{cases}$$

Where m_i is the number of rows of connectors parallel to the grain and n_i is the number of connectors arranged in the same row.

TAPE - TENSILE STRENGTH

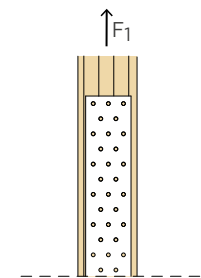| type	B	s	net area holes	$R_{ax,k}$
	[mm]	[mm]	[pcs]	[kN]
LBB 1,5 mm	40	1,5	2	**17,0**
	60	1,5	3	**25,5**
	80	1,5	4	**34,0**
LBB 3,0 mm	40	3,0	2	**26,7**

CONNECTORS SHEAR RESISTANCE

For the strength $R_{v,k}$ of the LBA Anker nails and of the LBS screws, refer to the "TIMBER SCREWS AND DECK FASTENING" catalogue.

GENERAL PRINCIPLES

- Characteristic values according to EN 1995:2014 and EN 1993:2014.
- The plate design strength values can be obtained as follows:

$$R_{ax,d} = \frac{R_{ax,k}}{\gamma_{M2}}$$

- The connectors design strength values can be obtained as follows:

$$R_{v,d} = \frac{R_{v,k} \cdot k_{mod}}{\gamma_M}$$

The coefficients k_{mod}, γ_M and γ_{M2} should be taken according to the current regulations used for the calculation.

- A timber density of $\rho_k = 350$ kg/m^3 was considered for the calculation process.
- Dimensioning and verification of the timber elements must be carried out separately.
- It is recommended to place the connectors symmetrically with respect to the load direction.

CALCULATION EXAMPLE | DETERMINING RESISTANCE R_{1d}

$\uparrow F_{1,d}$

B1

H2

B3
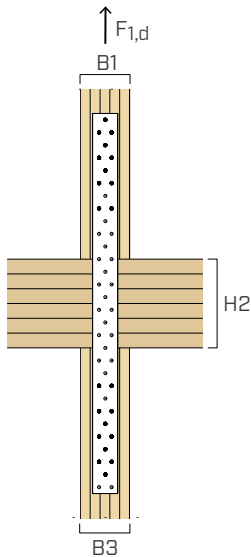
Project data

Strength	$F_{1,d}$	12,0 kN
Service class		2
Load duration		short
Solid timber C24		
Element 1	B1	80 mm
Element 2	H2	140 mm
Element 3	B3	80 mm

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

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

Anker nail LBA440[1]	
d_1 = 4,0 mm	
L = 40 mm	

Anker nail LBA440[1]	
d_1 = 4,0 mm	
L = 40 mm	

EVALUATION OF THE STRENGTH OF THE SYSTEM

perforated strap
LBB40

perforated plate
LBV401200
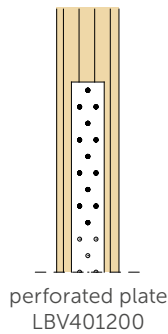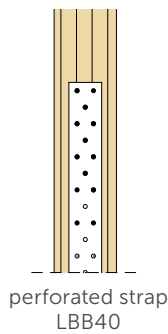
TAPE/PLATE - TENSILE STRENGTH

perforated strap LBB40			
$R_{ax,k}$	=	17,0	kN
γ_{M2}	=	1,25	
$R_{ax,d}$	=	**13,60**	**kN**

perforated plate LBV401200[2]			
$R_{ax,k}$	=	17,8	kN
γ_{M2}	=	1,25	
$R_{ax,d}$	=	**14,24**	**kN**

CONNECTOR - SHEAR STRENGTH

perforated strap LBB40			
$R_{v,k}$	=	2,19	kN
n_{tot}	=	13	pcs
n_1	=	5	pcs
m_1	=	2	lines
n_2	=	3	pcs
m_2	=	1	lines
k_{LBA}	=	0,85	
k_{mod}	=	0,90	
γ_M	=	1,30	
$R_{v,d}$	=	1,52	kN
$\sum m_i \cdot n_i^k \cdot R_{v,d}$	=	**15,77**	**kN**

perforated plate LBV401200[2]			
$R_{v,k}$	=	2,17	kN
n_{tot}	=	13	pcs
n_1	=	4	pcs
m_1	=	2	lines
n_2	=	5	pcs
m_2	=	1	lines
k_{LBA}	=	0,85	
k_{mod}	=	0,90	
γ_M	=	1,30	
$R_{v,d}$	=	1,50	kN
$\sum m_i \cdot n_i^k \cdot R_{v,d}$	=	**15,66**	**kN**

STRENGTH OF THE SYSTEM

$$R_{1,d} = min \begin{cases} R_{ax,d} \\ \sum m_i \cdot n_i^k \cdot R_{v,d} \end{cases}$$

perforated strap LBB40			
$R_{1,d}$	=	13,60	kN

perforated plate LBV401200[2]			
$R_{1,d}$	=	14,24	kN

VERIFICATION	$R_{1,d} \geq F_{1,d}$	**13,6 kN**	$\geq$	**12,0**	**kN** ✓	**14,2**	$\geq$	**12,0**	**kN** ✓
		verification passed				**verification passed**			

NOTES

[1] In the calculation example LBA Anker nails are used. The fastening can also be made with LBS screws (page 571).

[2] Plate LBV401200 is considered cut to length 600 mm.

GENERAL PRINCIPLES

• 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.