

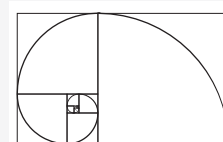
Metal hangers with internal wings

Bright zinc plated carbon steel three-dimensional perforated plate



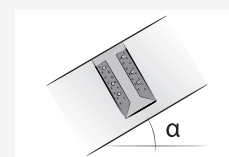
EFFECTIVE

Standardized, certified, fast and inexpensive system



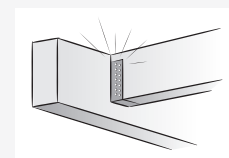
MIXED MODE BENDING

Suitable for fastening joists in mixed-mode bending



CONCEALED

Thanks to the internal wings, the joint results as almost "hidden"



ASSESSED

Versions homologated for joints with „I“ beams



FIELD OF USE

Timber-to-timber and timber-to-concrete joints, both for simple and mixed-mode bending

- solid timber
- glulam timber
- XLAM (Cross Laminated Timber)
- LVL
- wood-based panels



CONCEALED

Thanks to the internal wings, the junction is almost entirely hidden. The nailing distributed on the secondary beam makes the system light, effective and inexpensive



MIXED MODE BENDING

The hanger wings allow to realize joints with any inclination to the beam axis

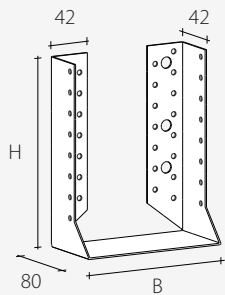


LARGE SIZE

Fast and inexpensive system, that allows the fixing of large size beams with hangers of small thickness

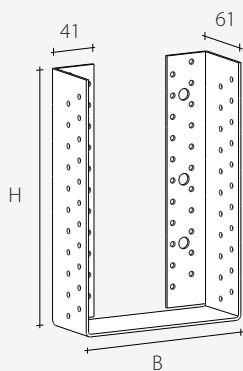
CODES AND DIMENSIONS

BSIS - SMOOTH



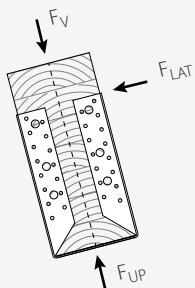
code	type	B [mm]	H [mm]	s [mm]		pcs/box
PF202000	BSI40110S	40	110	2,0	•	50
PF202006	BSI60100S	60	100	2,0	•	50
PF202010	BSI60160S	60	160	2,0	•	50
PF901400	BSI70125S	70	125	2,0	•	50
PF902020	BSI80120S	80	120	2,0	•	50
PF202025	BSI80150S	80	150	2,0	•	50
PF202030	BSI80180S	80	180	2,0	•	50
PF901405	BSI90145S	90	145	2,0	•	50
PF202027	BSI10090S	100	90	2,0	•	50
PF902030	BSI100140S	100	140	2,0	•	50
PF202035	BSI100170S	100	170	2,0	•	50
PF202040	BSI100200S	100	200	2,0	•	25
PF202045	BSI120120S	120	120	2,0	•	25
PF902050	BSI120160S	120	160	2,0	•	25
PF202055	BSI120190S	120	190	2,0	•	25
PF202060	BSI140140S	140	140	2,0	•	25
PF902065	BSI140180S	140	180	2,0	•	25

BSIG - LARGE SIZE



code	type	B [mm]	H [mm]	s [mm]		pcs/box
PF202410	BSI120240G	120	240	2,5	•	20
PF202420	BSI140240G	140	240	2,5	•	20
PF202430	BSI160160G	160	160	2,5	•	15
PF202435	BSI160200G	160	200	2,5	•	15
PF202455	BSI180220G	180	220	2,5	•	10
PF202465	BSI200200G	200	200	2,5	•	10
PF202470	BSI200240G	200	240	2,5	•	10

EXTERNAL LOADS



MATERIAL AND DURABILITY

BSI: Z275 bright zinc plated S250GD carbon steel.
To be used in Service class 1 and 2 (EN 1995:2008).

FIELD OF USE

Timber to timber joints
Timber to OSB joints (BSIS)

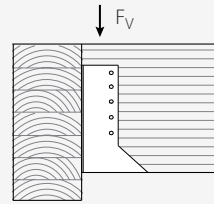
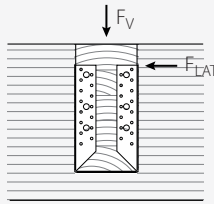
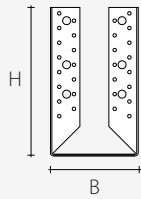


ADDITIONAL PRODUCTS - FASTENERS

type	description		d [mm]	support	p.
LBA	Anker nail		4		364
LBS	screw for plates		5		364

STATIC VALUES - TIMBER-TO-TIMBER JOINT

PARTIAL / TOTAL NAILING ⁽¹⁾



BSIS - SMOOTH			PARTIAL NAILING				TOTAL NAILING				
			NUMBER OF FASTENERS		CHARACTERISTIC VALUES		NUMBER OF FASTENERS		CHARACTERISTIC VALUES		ADMISSIBLE VALUES
B [mm]	H [mm]	nails LBA d x L [mm]	n _H ⁽²⁾ [pcs]	n _J ⁽³⁾ [pcs]	R _{V,k} ↓ [kN]	R _{LAT,k} ← [kN]	n _H ⁽²⁾ [pcs]	n _J ⁽³⁾ [pcs]	R _{V,k} ↓ [kN]	R _{LAT,k} ← [kN]	V _{adm} ↓ [kg]
40 *	110	Ø4 x 40	8	4	8,7	1,9	-	-	-	-	-
60 *	100	Ø4 x 40	8	4	7,6	2,6	-	-	-	-	-
60 *	160	Ø4 x 40	12	6	15,0	3,4	-	-	-	-	-
70 *	125	Ø4 x 40	10	6	10,5	3,7	-	-	-	-	-
80	120	Ø4 x 40	10	6	10,4	4,0	18	10	18,3	6,7	714
80	150	Ø4 x 40	12	6	14,8	4,0	22	12	26,3	7,6	857
80	180	Ø4 x 40	14	8	12,8	4,8	26	14	30,0	8,4	1000
90	145	Ø4 x 40	12	6	14,2	4,2	22	12	25,7	8,0	857
100	90	Ø4 x 60	6	4	8,7	4,8	12	6	16,8	7,2	429
100	140	Ø4 x 60	12	6	18,9	6,5	22	12	33,1	12,3	857
100	170	Ø4 x 60	14	8	23,6	7,7	26	14	37,8	13,5	1000
100	200	Ø4 x 60	16	8	23,6	7,7	30	16	42,5	14,6	1143
120	120	Ø4 x 60	10	6	15,6	7,0	18	10	27,5	11,7	714
120	160	Ø4 x 60	14	8	23,6	8,5	26	14	37,8	14,9	1000
120	190	Ø4 x 60	16	8	23,6	8,5	30	16	42,5	16,2	1143
140	140	Ø4 x 60	12	6	18,9	7,4	22	12	33,1	14,3	857
140	180	Ø4 x 60	16	8	23,6	9,1	30	16	42,5	17,5	1143

BSIG - LARGE SIZE			PARTIAL NAILING				TOTAL NAILING				
			NUMBER OF FASTENERS		CHARACTERISTIC VALUES		NUMBER OF FASTENERS		CHARACTERISTIC VALUES		ADMISSIBLE VALUES
B [mm]	H [mm]	nails LBA d x L [mm]	n _H ⁽²⁾ [pcs]	n _J ⁽³⁾ [pcs]	R _{V,k} ↓ [kN]	R _{LAT,k} ← [kN]	n _H ⁽²⁾ [pcs]	n _J ⁽³⁾ [pcs]	R _{V,k} ↓ [kN]	R _{LAT,k} ← [kN]	V _{adm} ↓ [kg]
120	240	Ø4 x 60	24	16	40,7	12,3	46	30	75,6	22,9	2143
140	240	Ø4 x 60	24	16	40,7	13,3	46	30	75,6	25,6	2143
160	160	Ø4 x 60	16	10	21,2	11,1	30	18	41,6	19,9	1286
160	200	Ø4 x 60	20	12	30,7	12,3	38	22	56,7	22,4	1571
180	220	Ø4 x 60	22	14	35,7	15,2	42	26	66,2	27,0	1857
200	200	Ø4 x 60	20	12	30,7	13,7	38	22	56,7	25,0	1571
200	240	Ø4 x 60	24	16	40,7	16,9	46	30	75,6	31,6	2143

GENERAL PRINCIPLES

- Characteristic values are consistent with EN 1995:2008 and in accordance with ETA.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_m}$$

Coefficients γ_m and k_{mod} must be taken according to the current Standard adopted for the design.

- Admissible values are obtained according to DIN 1052:1988.
- For calculations, a timber density $\rho_k = 350 \text{ kg/m}^3$ has been considered.
- Dimensioning and verification of timber elements must be carried out separately.
- In case of $F_{V,k}$ parallel to the grain, partial nailing is required.

In case of combined loading the following verification shall be satisfied:

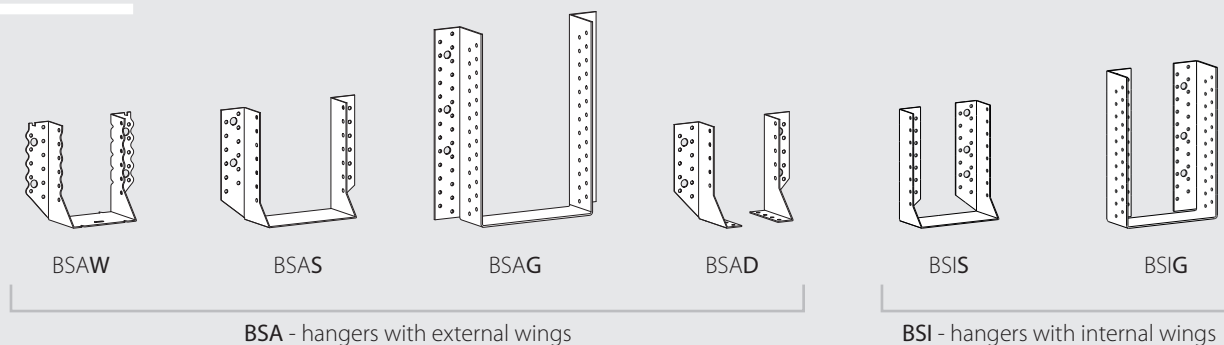
$$\left(\frac{F_{V,d}}{R_{V,d}} \right)^2 + \left(\frac{F_{LAT,d}}{R_{LAT,d}} \right)^2 \leq 1$$

NOTES

- ⁽¹⁾ For total or partial nailing patterns please refer to the guidelines reported at p. 232.
- ⁽²⁾ n_H = number of fasteners on the main joist
- ⁽³⁾ n_J = number of fasteners on the secondary joist

METAL HANGERS

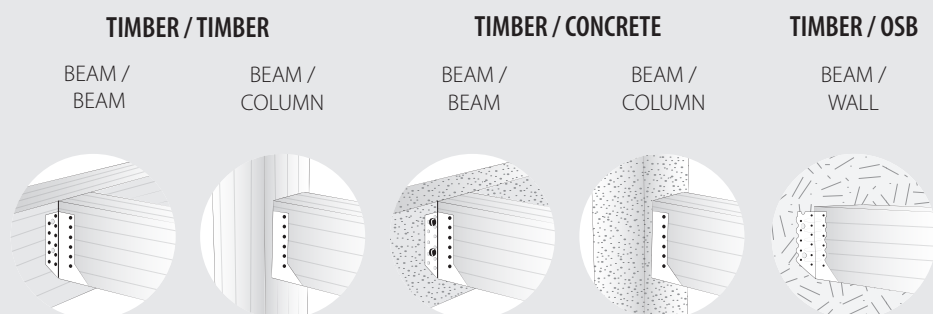
PRODUCT RANGE



APPLICATIONS

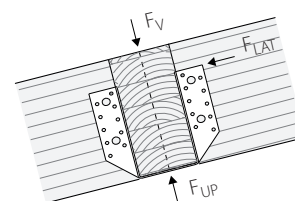
Strength values depend on the onsite installation and support type.

The main configurations are:



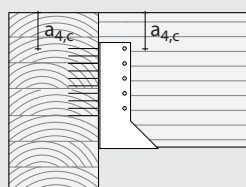
The hanger can be applied to horizontal or inclined beams.

The hanger can be subjected to combined loading.



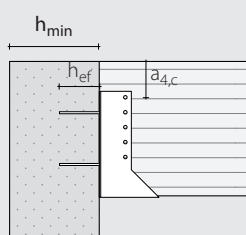
INSTALLATION - Minimum distances

TIMBER - TIMBER



			nail LBA Ø4	screw LBS Ø5
first connector - joist extrados	$a_{4,c}$ [mm]	$\geq 5d$	≥ 20	≥ 25

TIMBER - CONCRETE



		anchor VINYLPRO		
		Ø8	Ø10	Ø12
minimum support thickness	h_{min} [mm]	$h_{ef} + 30 \text{ mm} \geq 100$		
hole diameter in concrete	d_0 [mm]	10	12	14
tightening torque	T_{inst} [Nm]	10	20	40

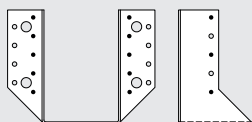
h_{ef} = effective anchorage length in concrete

INSTALLATION - Fasteners

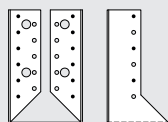


TIMBER - TIMBER

BSAW / BSAS



BSIS



MAIN BEAM (n_H)

SECONDARY BEAM (n_J)

PARTIAL NAILING ●

n_H nails positioned on the column closest to the lateral wing of the hanger

n_J nails with alternate pattern

TOTAL NAILING ● + ○

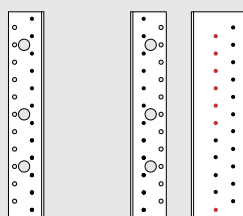
n_H nails in all the holes

n_J nails in all the holes

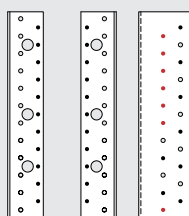


TIMBER - TIMBER - large size

BSAG



BSIG



MAIN BEAM (n_H)

SECONDARY BEAM (n_J)

PARTIAL NAILING ●

n_H nails positioned on the column closest to the lateral wing of the hanger

(●) Nails n_J with alternate pattern, avoiding the holes marked in red

TOTAL NAILING ● + ○

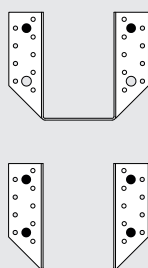
n_H nails in all the holes

(●) Nails n_J with alternate pattern, avoiding the holes marked in red

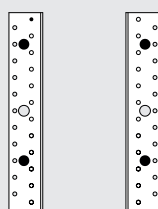


TIMBER - CONCRETE

BSAW / BSAS



BSAG



MAIN BEAM (n_H)

SECONDARY BEAM (n_J)

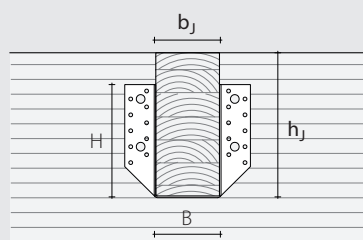
FIXING OF THE ANCHORS (n_{bolt}) ●

The n_{bolt} anchors shall be placed symmetrically with respect to the vertical axis. At least two anchors should be positioned in the top holes.

n_J nails positioned according to total nailing patterns as shown above.

INSTALLATION - Recommended dimensions

SECONDARY BEAM



B = hanger width / H = hanger height / b_j = secondary joist width / h_j = secondary joist depth

nail LBA Ø4

screw LBS Ø5

secondary joist depth [mm]	$h_{J\text{MIN}}$ [mm]	$H + 12 \text{ mm}$	$H + 17 \text{ mm}$
	$h_{J\text{MAX}}$ [mm]	$1,5 H$	