

CONCEALED BEAM HANGER WITH AND WITHOUT HOLES

STEEL - ALUMINUM

EN AW-6005A high strength aluminum alloy, obtained by extrusion thus weld-free.

TIMBER AND CONCRETE

Optimal hole spacing both for timber (nails or screws) and concrete (chemical or screwed anchor).

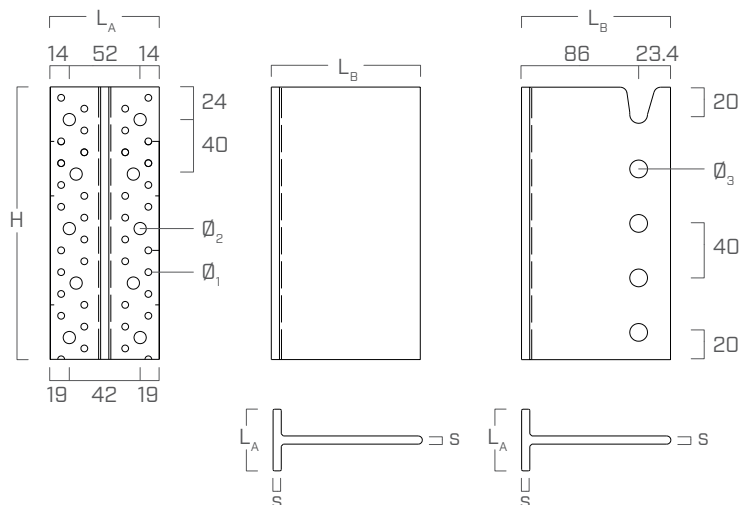
SPARES MANAGEMENT

Versions without holes available in 2200 mm long pieces with notches every 40 mm, to be cut onsite according to the worksite needs.



ALUMIDI
WITHOUT HOLES

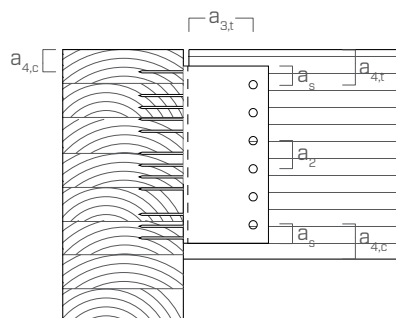
ALUMIDI
WITH HOLES



GEOMETRY

		ALUMIDI without holes	ALUMIDI with holes
Thickness	s	[mm] 6 [inch] 1/4"	6 1/4"
Flange width	L _A	[mm] 80 [inch] 3 1/8"	80 3 1/8"
Web length	L _B	[mm] 109.4 [inch] 4 5/16"	109.4 4 5/16"
Small flange-holes	Ø ₁	[mm] 5.0 [inch] 13/64"	5.0 13/64"
Large flange-holes	Ø ₂	[mm] 9.0 [inch] 23/64"	9.0 23/64"
Web holes (dowels)	Ø ₃	[mm] - [inch] -	13.0 33/64"

■ INSTALLATION: MINIMUM DISTANCES



SECONDARY BEAM - TIMBER				self-drilling dowel SBD Ø7.5	smooth dowel STA Ø12
Dowel - Dowel	a_2	[mm] [inch]	$\geq 3 d$	≥ 23 29/32"	≥ 36 1 27/64"
Dowel - Beam extrados	$a_{4,t}$	[mm] [inch]	$\geq 4 d$	≥ 30 1 3/16"	≥ 48 1 57/64"
Dowel - Beam intrados	$a_{4,c}$	[mm] [inch]	$\geq 3 d$	≥ 23 29/32"	≥ 36 1 27/64"
Dowel - Beam end	$a_{3,t}$	[mm] [inch]	$\geq \{7d; 80\}$	≥ 80 3 5/32"	≥ 80 3 5/32"
Dowel - Bracket edge	a_s	[mm] [inch]	$\geq 1.2 d_0^{(1)}$	≥ 10 25/64"	≥ 16 5/8"

MAIN BEAM - TIMBER				anker nail LBA Ø4	screw LBS Ø5
First connector – Beam extrados	$a_{4,c}$	[mm] [inch]	$\geq 5 d$	≥ 20 25/32"	≥ 25 1"

GENERAL PRINCIPLES:

The characteristic values comply with the EN 1995:2008 standard in accordance with ETA-09/0361.

Design values for wood-side are obtained from characteristic values as follows: $R_d = R_k \cdot DMF$

DMF: design modification factor based on k_{mod} (modification factor according to EN 1995-1-1) and for γ_M (partial factors for material properties and resistances according to EN 1995-1-1 - $\gamma_M = 1.3$)

Load case	Load Combination		Design Modification Factor DMF
	Principal Load	Companion Load	
1	1.4D	-	0.46
2	(1.25D or 0.9D) + 1.5L	1.0S or 0.4W	0.62 *
3	(1.25D or 0.9D) + 1.5S	1.0L or 0.4W	0.62
4	(1.25D or 0.9D) + 1.4W	0.5L or 0.5S	0.69
5	1.0D + 1.0E	0.5L or 0.25S	0.69

* If Live Load L is associated with long term loads such as storage, equipment areas etc., use 0.54

In the calculations, the density of the wood elements was considered equal to $\rho_k = 370 \text{ kg/m}^3$ (S-P-F sawn lumber). Wood densities conversion (mean oven-dry relative density to 5th-percentile density 12% MC wt & vol) as proposed in chapter 4. of Wood Handbook. Characteristic resistances can also be considered as valid for higher densities, for the purposes of safety

All strength values of the connection system are valid for the calculation hypotheses listed in the table. For different configurations the free software myProject is available (www.rothoblaas.com)

Sizing and verification of wood elements must be done separately. In some cases the connection shear strength $R_{V,k}$ is notably high and may be higher than the secondary joist shear strength. Particular attention should be paid to the shear stress of the reduced timber cross-section in correspondence with the bracket location

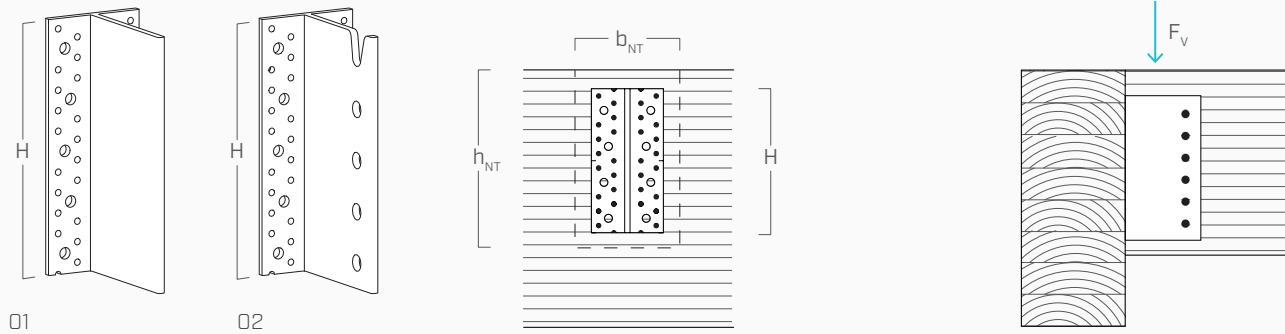
NOTES:

⁽¹⁾ Hole diameter

⁽²⁾ Self-drilling dowels SBD Ø7.5 ($f_{u,k} = 740 \text{ N/mm}^2$)

⁽³⁾ Smooth dowels STA Ø12 ($f_{u,k} = 360 \text{ N/mm}^2$)

■ STATIC VALUES - TIMBER-TO-TIMBER JOINT - RIGHT ANGLE - TOTAL NAILING



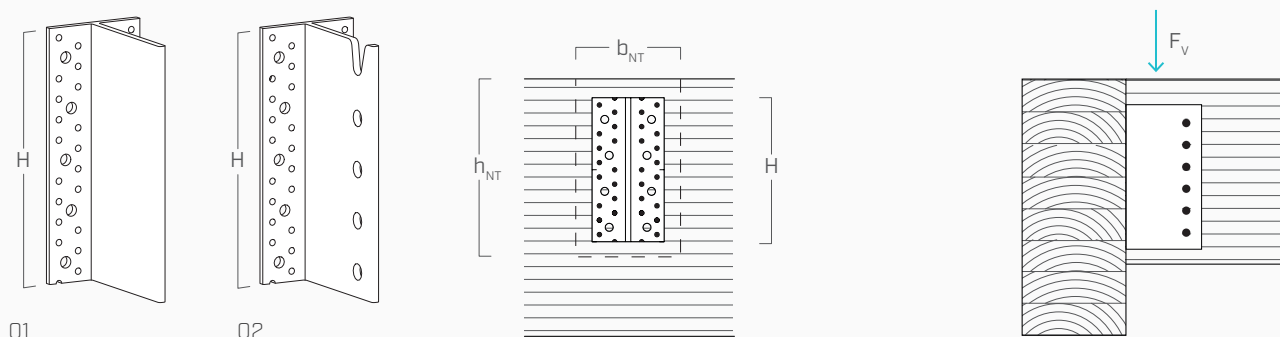
O1 - ALUMIDI WITHOUT HOLES: FIXING THROUGH NAILS

						SECONDARY BEAM	MAIN BEAM	CHARACTERISTIC VALUES		DESIGN VALUES (FACTORED RESISTANCE)					
H		b _{NT}		h _{NT}		dowels SBD ⁽²⁾ Ø7.5	nails LBA Ø4 x 60	R _{V,k}		R _{V,d} Load Case 1		R _{V,d} Load Case 263		R _{V,d} Load Case 485	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[pcs - Ø x L]	[pcs]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]
80	3 1/8"	80	3 1/8"	120	4 3/4"	2 - Ø7.5 x 75	14	5.68	1,277	2.6	589	3.5	786	3.9	884
		120	4 3/4"	120	4 3/4"	3 - Ø7.5 x 115		5.68	1,277	2.6	589	3.5	786	3.9	884
120	4 3/4"	80	3 1/8"	160	6 1/4"	3 - Ø7.5 x 75	22	13.8	3,107	6.4	1,434	8.5	1,912	9.6	2,151
		120	4 3/4"	160	6 1/4"	4 - Ø7.5 x 115		13.8	3,107	6.4	1,434	8.5	1,912	9.6	2,151
160	6 1/4"	100	4"	200	7 7/8"	4 - Ø7.5 x 95	30	25.1	5,649	11.6	2,607	15.5	3,477	17.4	3,911
		120	4 3/4"	200	7 7/8"	5 - Ø7.5 x 115		25.1	5,649	11.6	2,607	15.5	3,477	17.4	3,911
200	7 7/8"	100	4"	240	9 1/2"	5 - Ø7.5 x 95	38	36.9	8,300	17.0	3,831	22.7	5,108	25.6	5,746
		120	4 3/4"	240	9 1/2"	6 - Ø7.5 x 115		39.1	8,786	18.0	4,055	24.0	5,406	27.1	6,082
240	9 1/2"	120	4 3/4"	280	11"	7 - Ø7.5 x 115	46	55.2	12,400	25.5	5,723	33.9	7,631	38.2	8,585
		140	5 1/2"	280	11"	8 - Ø7.5 x 135		55.2	12,400	25.5	5,723	33.9	7,631	38.2	8,585
280*	11"	140	5 1/2"	320	12 5/8"	8 - Ø7.5 x 135	54	71.2	16,006	32.9	7,388	43.8	9,850	49.3	11,081
		160	6 1/4"	320	12 5/8"	9 - Ø7.5 x 155		72.9	16,384	33.6	7,562	44.8	10,083	50.5	11,343
320*	12 5/8"	160	6 1/4"	360	14 1/4"	9 - Ø7.5 x 155	62	88.4	19,871	40.8	9,171	54.4	12,228	61.2	13,757
		180	7 1/8"	360	14 1/4"	10 - Ø7.5 x 175		91.8	20,640	42.4	9,526	56.5	12,701	63.6	14,289
360*	14 1/4"	160	6 1/4"	400	15 3/4"	10 - Ø7.5 x 155	70	98.2	22,078	45.3	10,190	60.4	13,587	68.0	15,285
		180	7 1/8"	400	15 3/4"	11 - Ø7.5 x 175		111.6	25,093	51.5	11,581	68.7	15,442	77.3	17,372
400*	15 3/4"	160	6 1/4"	440	17 1/4"	11 - Ø7.5 x 155	78	108.0	24,286	49.9	11,209	66.5	14,945	74.8	16,813
		180	7 1/8"	440	17 1/4"	12 - Ø7.5 x 175		129.6	29,142	59.8	13,450	79.8	17,934	89.7	20,175

O2 - ALUMIDI WITH HOLES: FIXING THROUGH NAILS

						SECONDARY BEAM	MAIN BEAM	CHARACTERISTIC VALUES		DESIGN VALUES (FACTORED RESISTANCE)					
H		b _{NT}		h _{NT}		dowels STA ⁽³⁾ Ø12	nails LBA Ø4 x 60	R _{V,k}		R _{V,d} Load Case 1		R _{V,d} Load Case 2&3		R _{V,d} Load Case 4&5	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[pcs - Ø x L]	[pcs]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]
120	4 3/4"	120	4 3/4"	160	6 1/4"	3 - Ø12 x 120	22	13.8	3,107	6.4	1,434	8.5	1,912	9.6	2,151
160	6 1/4"	120	4 3/4"	200	7 7/8"	4 - Ø12 x 120	30	25.1	5,649	11.6	2,607	15.5	3,477	17.4	3,911
200	7 7/8"	120	4 3/4"	240	9 1/2"	5 - Ø12 x 120	38	39.1	8,786	18.0	4,055	24.0	5,406	27.1	6,082
240	9 1/2"	120	4 3/4"	280	11"	6 - Ø12 x 120	46	55.2	12,400	25.5	5,723	33.9	7,631	38.2	8,585
280	11"	140	5 1/2"	320	12 5/8"	7 - Ø12 x 140	54	72.9	16,384	33.6	7,562	44.8	10,083	50.5	11,343
320	12 5/8"	140	5 1/2"	360	14 1/4"	8 - Ø12 x 140	62	91.8	20,640	42.4	9,526	56.5	12,701	63.6	14,289
360	14 1/4"	160	6 1/4"	400	15 3/4"	9 - Ø12 x 160	70	111.6	25,093	51.5	11,581	68.7	15,442	77.3	17,372
400*	15 3/4"	160	6 1/4"	440	17 1/4"	10 - Ø12 x 160	78	132.0	29,684	60.9	13,700	81.3	18,267	91.4	20,550

* dimension obtainable from ALUMIDI2200



O1 - ALUMIDI WITHOUT HOLES: FIXING THROUGH SCREWS

						SECONDARY BEAM	MAIN BEAM	CHARACTERISTIC VALUES		DESIGN VALUES (FACTORED RESISTANCE)					
H		b _{NT}		h _{NT}		dowels SBD ⁽²⁾ Ø7.5	screws LBS Ø5 x 60	R _{V,k}		R _{V,d} Load Case 1		R _{V,d} Load Case 283		R _{V,d} Load Case 465	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[pcs - Ø x L]	[pcs]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]
80	3 1/8"	80	3 1/8"	120	4 3/4"	2 - Ø7.5 x 75	14	11.44	2,572	5.3	1,187	7.0	1,583	7.9	1,780
		120	4 3/4"	120	4 3/4"	3 - Ø7.5 x 115		11.44	2,572	5.3	1,187	7.0	1,583	7.9	1,780
120	4 3/4"	80	3 1/8"	160	6 1/4"	3 - Ø7.5 x 75	22	20.8	4,681	9.6	2,160	12.8	2,880	14.4	3,240
		120	4 3/4"	160	6 1/4"	4 - Ø7.5 x 115		26.3	5,919	12.2	2,732	16.2	3,643	18.2	4,098
160	6 1/4"	100	4"	200	7 7/8"	4 - Ø7.5 x 95	30	29.5	6,641	13.6	3,065	18.2	4,087	20.5	4,598
		120	4 3/4"	200	7 7/8"	5 - Ø7.5 x 115		40.4	9,073	18.6	4,188	24.8	5,584	27.9	6,282
200	7 7/8"	100	4"	240	9 1/2"	5 - Ø7.5 x 95	38	36.9	8,300	17.0	3,831	22.7	5,108	25.6	5,746
		120	4 3/4"	240	9 1/2"	6 - Ø7.5 x 115		48.4	10,887	22.4	5,025	29.8	6,700	33.5	7,537
240	9 1/2"	120	4 3/4"	280	11"	7 - Ø7.5 x 115	46	56.5	12,702	26.1	5,862	34.8	7,816	39.1	8,793
		140	5 1/2"	280	11"	8 - Ø7.5 x 135		71.2	16,006	32.9	7,388	43.8	9,850	49.3	11,081
280*	11"	140	5 1/2"	320	12 5/8"	8 - Ø7.5 x 135	54	71.2	16,006	32.9	7,388	43.8	9,850	49.3	11,081
		160	6 1/4"	320	12 5/8"	9 - Ø7.5 x 155		88.4	19,871	40.8	9,171	54.4	12,228	61.2	13,757
320*	12 5/8"	160	6 1/4"	360	14 1/4"	9 - Ø7.5 x 155	62	88.4	19,871	40.8	9,171	54.4	12,228	61.2	13,757
		180	7 1/8"	360	14 1/4"	10 - Ø7.5 x 175		108.0	24,284	49.9	11,208	66.5	14,944	74.8	16,812
360*	14 1/4"	160	6 1/4"	400	15 3/4"	10 - Ø7.5 x 155	70	98.2	22,078	45.3	10,190	60.4	13,587	68.0	15,285
		180	7 1/8"	400	15 3/4"	11 - Ø7.5 x 175		118.8	26,714	54.8	12,330	73.1	16,439	82.3	18,494
400*	15 3/4"	160	6 1/4"	440	17 1/4"	11 - Ø7.5 x 155	78	108.0	24,286	49.9	11,209	66.5	14,945	74.8	16,813
		180	7 1/8"	440	17 1/4"	12 - Ø7.5 x 175		129.6	29,142	59.8	13,450	79.8	17,934	89.7	20,175

O2 - ALUMIDI WITH HOLES: FIXING THROUGH SCREWS

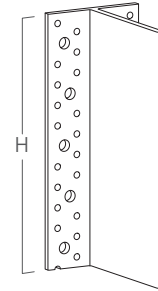
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H		b _{NT}		h _{NT}		dowels STA ⁽³⁾ Ø12	screws LBS Ø5 x 60	R _{V,k}		R _{V,d} Load Case 1		R _{V,d} Load Case 283		R _{V,d} Load Case 465	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[pcs - Ø x L]	[pcs]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]	[kN]	[lbf]
120	4 3/4"	120	4 3/4"	160	6 1/4"	3 - Ø12 x 120	22	26.3	5,919	12.2	2,732	16.2	3,643	18.2	4,098
160	6 1/4"	120	4 3/4"	200	7 7/8"	4 - Ø12 x 120	30	44.8	10,074	20.7	4,649	27.6	6,199	31.0	6,974
200	7 7/8"	120	4 3/4"	240	9 1/2"	5 - Ø12 x 120	38	57.3	12,891	26.5	5,949	35.3	7,933	39.7	8,924
240	9 1/2"	120	4 3/4"	280	11"	6 - Ø12 x 120	46	68.8	15,467	31.8	7,139	42.3	9,518	47.6	10,708
280	11"	140	5 1/2"	320	12 5/8"	7 - Ø12 x 140	54	88.1	19,803	40.7	9,140	54.2	12,187	61.0	13,710
320	12 5/8"	140	5 1/2"	360	14 1/4"	8 - Ø12 x 140	62	100.7	22,634	46.5	10,446	62.0	13,928	69.7	15,670
360	14 1/4"	160	6 1/4"	400	15 3/4"	9 - Ø12 x 160	70	124.2	27,919	57.3	12,886	76.4	17,181	86.0	19,329
400*	15 3/4"	160	6 1/4"	440	17 1/4"	10 - Ø12 x 160	78	138.0	31,019	63.7	14,317	84.9	19,089	95.5	21,475

ALUMIDI

CODES AND DIMENSIONS

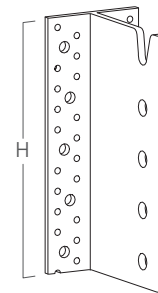
ALUMIDI WITHOUT HOLES

CODE	type	H [mm]	H [inch]	pcs.
ALUMIDI80	without holes	80	3 1/8"	25
ALUMIDI120	without holes	120	4 3/4"	25
ALUMIDI160	without holes	160	6 1/4"	25
ALUMIDI200	without holes	200	7 7/8"	15
ALUMIDI240	without holes	240	9 1/2"	15
ALUMIDI2200	without holes	2200	86 13/32"	1



ALUMIDI WITH HOLES

CODE	type	H [mm]	H [inch]	pcs.
ALUMIDI120L	with holes	120	4 3/4"	25
ALUMIDI160L	with holes	160	6 1/4"	25
ALUMIDI200L	with holes	200	7 7/8"	15
ALUMIDI240L	with holes	240	9 1/2"	15
ALUMIDI280L	with holes	280	11"	15
ALUMIDI320L	with holes	320	12 5/8"	8
ALUMIDI360L	with holes	360	14 1/4"	8

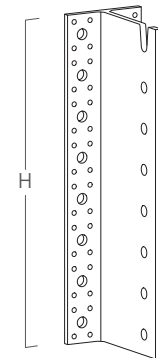


ALUMAXI

CODES AND DIMENSIONS

ALUMAXI WITH HOLES

CODE	type	H [mm]	H [inch]	pcs.
ALUMAXI384L	with holes	384	15 1/8"	1
ALUMAXI512L	with holes	512	20 3/16"	1
ALUMAXI640L	with holes	640	25 3/16"	1
ALUMAXI768L	with holes	768	30 1/4"	1
ALUMAXI2176L	with holes	2176	85 43/64"	1



ALUMAXI WITHOUT HOLES

CODE	type	H [mm]	H [inch]	pcs.
ALUMAXI2176	without holes	2176	85 43/64"	1

