

## CONCEALED BRACKET WITH AND WITHOUT HOLES

### SUPERIOR STRENGTH

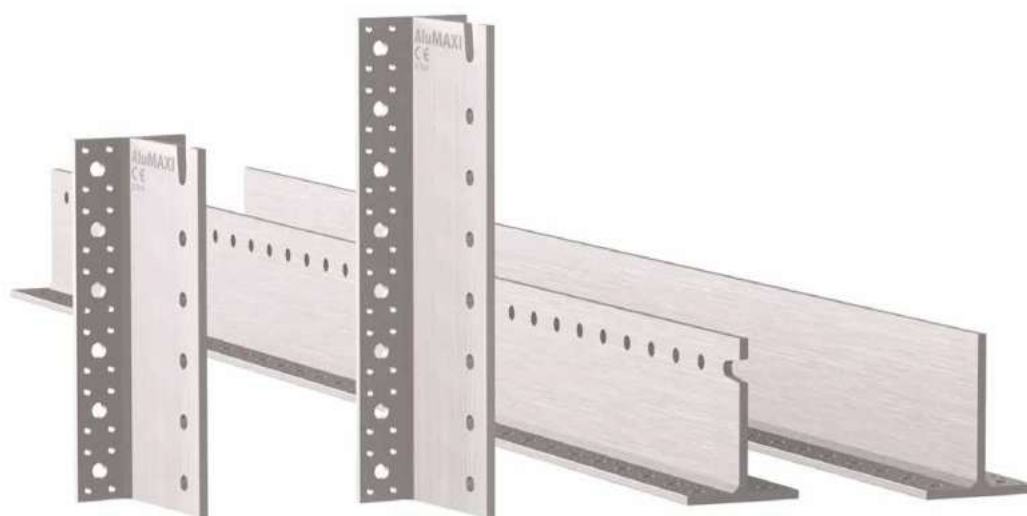
Standard connection system developed to guarantee higher values of design strength. All values are calculated and certified.

### STEEL-ALUMINUM

EN AW-6005A high strength aluminium alloy bracket, obtained by extrusion and therefore weld-free.

### FAST FASTENING

Certified strengths calculated in all directions: vertical, horizontal and axial. Certified fastening with LBS screws and SBD self-drilling dowels.



## CHARACTERISTICS

|                 |                                                 |
|-----------------|-------------------------------------------------|
| FOCUS           | concealed joints                                |
| TIMBER SECTIONS | from 160 x 432 mm to 280 x 1200 mm              |
|                 | from 6 5/16 x 17 inch to 11 x 47 1/4 inch       |
| STRENGTH        | R <sub>v,k</sub> up to 345 kN                   |
|                 | adjusted load carrying capacity up to 26585 lbs |
| FASTENERS       | LBA, LBS, SBD, STA, VIN-FIX PRO                 |

### VIDEO

Scan the QR Code and watch the video on our YouTube channel



## MATERIAL

Aluminium alloy three dimensional perforated plate.

## FIELDS OF USE

Timber-to-timber and timber-to-concrete shear joints, both perpendicular and inclined

- solid timber and glulam
- CLT, LVL
- timber based panels



## FIRE RESISTANCE

The low weight of the steel-aluminium alloy facilitates easy transportation and on-site movements, while guaranteeing a very high strength.

Being a concealed joint, it satisfies the fire safety requirements.

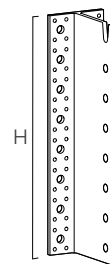
## LARGE SCALE STRUCTURES

Ideal for joints between oversize beams or when high strength is required. The version without holes provides free choice when positioning the dowels.

## CODES AND DIMENSIONS

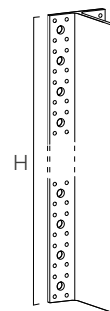
### ALUMAXI WITH HOLES

| CODE         | type       | H    |       | pcs |
|--------------|------------|------|-------|-----|
|              |            | [mm] | [in]  |     |
| ALUMAXI384L  | with holes | 384  | 15.12 | 1   |
| ALUMAXI512L  | with holes | 512  | 20.16 | 1   |
| ALUMAXI640L  | with holes | 640  | 25.20 | 1   |
| ALUMAXI768L  | with holes | 768  | 30.24 | 1   |
| ALUMAXI2176L | with holes | 2176 | 85.67 | 1   |



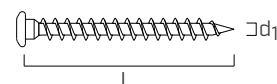
### ALUMAXI WITHOUT HOLES

| CODE        | type          | H    |       | pcs |
|-------------|---------------|------|-------|-----|
|             |               | [mm] | [in]  |     |
| ALUMAXI2176 | without holes | 2176 | 85.67 | 1   |



### LBS

| CODE    | d <sub>1</sub> |      | L    |       | b    |         | TX   | pcs |
|---------|----------------|------|------|-------|------|---------|------|-----|
|         | [mm]           | [in] | [mm] | [in]  | [mm] | [in]    |      |     |
| LBS760  | 7              | 0.28 | 60   | 2 3/8 | 55   | 2 3/16  | TX30 | 100 |
| LBS780  | 7              | 0.28 | 80   | 3 1/8 | 75   | 2 15/16 | TX30 | 100 |
| LBS7100 | 7              | 0.28 | 100  | 4     | 95   | 3 3/4   | TX30 | 100 |



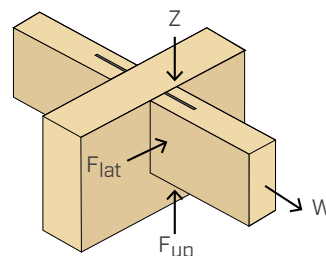
### MATERIAL AND DURABILITY

ALUMAXI: EN AW-6005A aluminium alloy.  
To be used in dry service conditions.

### FIELDS OF USE

- Timber-to-timber, timber-to-concrete and timber-to-steel joints
- Secondary beam on main beam or on column
- Perpendicular and inclined joints

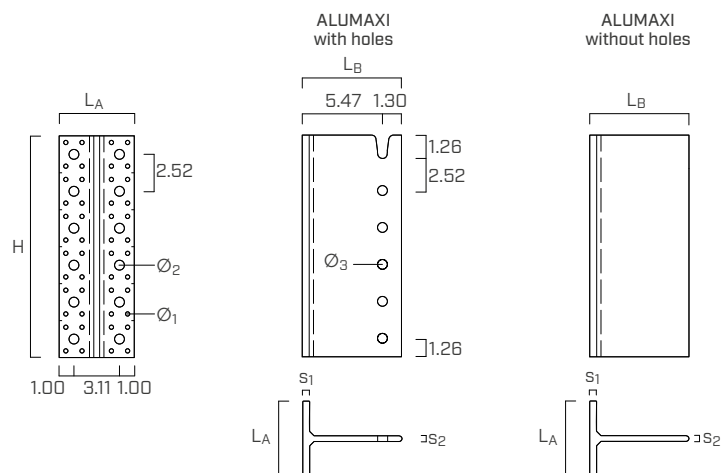
### EXTERNAL LOADS



## ADDITIONAL PRODUCTS - FASTENING

| type         | description         |  | d    |      | support |
|--------------|---------------------|--|------|------|---------|
|              |                     |  | [mm] | [in] |         |
| LBA          | Anker nail          |  | 6    | 0.24 |         |
| LBS          | screw for plates    |  | 7    | 0.28 |         |
| SBD          | self-drilling dowel |  | 7,5  | 0.30 |         |
| STA          | smooth dowel        |  | 16   | 0.63 |         |
| KOS          | bolt                |  | M16  | 0.63 |         |
| VIN-FIX PRO  | chemical anchor     |  | M16  | 0.63 |         |
| EPO-FIX PLUS | chemical anchor     |  | M16  | 0.63 |         |

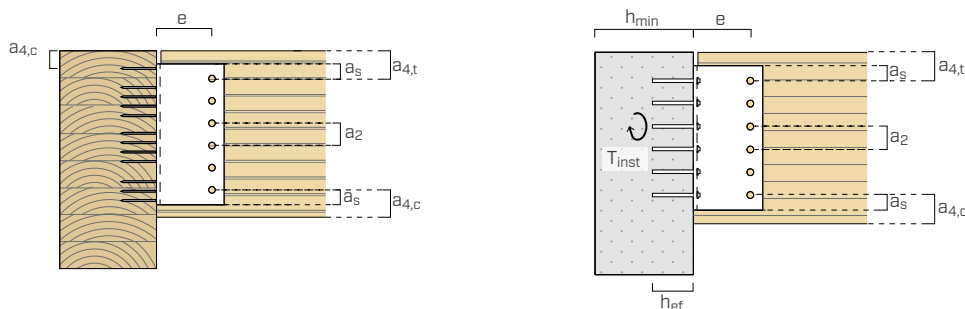
## GEOMETRY



| ALUMAXI            |                      | [mm] | [in] |
|--------------------|----------------------|------|------|
| flange thickness   | $s_1$ [mm]           | 12   | 0.47 |
| web thickness      | $s_2$ [mm]           | 10   | 0.39 |
| wing width         | $L_A$ [mm]           | 130  | 5.12 |
| web length         | $L_B$ [mm]           | 172  | 6.77 |
| small flange-holes | $\varnothing_1$ [mm] | 7,5  | 0.29 |
| large flange-holes | $\varnothing_2$ [mm] | 17,0 | 0.70 |
| web holes (dowels) | $\varnothing_3$ [mm] | 17,0 | 0.70 |

## INSTALLATION

### MINIMUM DISTANCES



| secondary beam-timber |                  |                      | self-drilling dowel<br>SBD Ø0.30 | smooth dowel<br>STA Ø0.63 |
|-----------------------|------------------|----------------------|----------------------------------|---------------------------|
| dowel-dowel           | $a_2$ [in]       | $\geq 3 d$           | $\geq 0.90$                      | $\geq 1.89$               |
| dowel-top of beam     | $a_{4,t}$ [in]   | $\geq 4 d$           | $\geq 1.18$                      | $\geq 2.52$               |
| dowel-bottom of beam  | $a_{4,c}$ [in]   | $\geq 3 d$           | $\geq 0.90$                      | $\geq 1.89$               |
| dowel-bracket edge    | $a_s$ [in]       | $\geq 1,2 d_0^{(1)}$ | $\geq 0.39$                      | $\geq 0.83$               |
| dowel-dowel           | $a_1^{(2)}$ [in] | $\geq 3 d$           | $\geq 0.90$                      | -                         |
| dowel-main beam       | $e$ [in]         |                      | $3,62 \div 5,47$                 | 5.47                      |

(1) Hole diameter.

(2) Spacing between dowels parallel to the grain for force-fibre angle  $\alpha = 90^\circ$  for application with SBD.

| main beam-timber            |                |            | Anker nail<br>LBA Ø0.24 | screw<br>LBS Ø0.28 |
|-----------------------------|----------------|------------|-------------------------|--------------------|
| first connector-top of beam | $a_{4,c}$ [in] | $\geq 5 d$ | $\geq 1.18$             | $\geq 1.38$        |

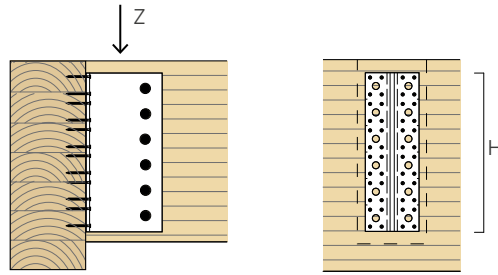
The minimum spacing and distances of Rotho Blaas fasteners are according to the European Technical Assessment ETA-09/0361 and to the Eurocode 5. The values from ETA-09/0361 are based on experimental tests carried out according to ETAG015 for several configurations. The values from Eurocode 5 are based on extensive research studies.

| main beam-concrete        |                    |  | chemical anchor<br>VIN-FIX PRO Ø0.63 |
|---------------------------|--------------------|--|--------------------------------------|
| minimum support thickness | $h_{min}$ [in]     |  | $h_{ef} + 1.18 \geq 3.94$            |
| concrete hole diameter    | $d_0$ [in]         |  | 0.71                                 |
| tightening torque         | $T_{inst}$ [ft-lb] |  | 59.00                                |

$h_{ef}$  = effective anchoring depth in concrete

## ■ ADJUSTED DESIGN VALUES | TIMBER-TO-TIMBER JOINT

### FULL NAILING - CONNECTION WITH NAILS PERPENDICULAR TO THE GRAIN



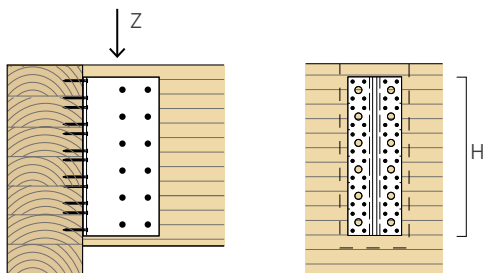
ALUMAXI with STA dowels and LBA nails - full nailing

#### ASD DESIGN VALUES

| ALUMAXI |       | dowels               | nails                          | full  |
|---------|-------|----------------------|--------------------------------|-------|
| H       |       | STA Ø16 mm   0.63"   | LBA Ø6 x 60 mm   0.24 x 2 3/8" | Z'    |
| [mm]    | [in]  | [pcs. - L]           | [pcs.]                         | [lbs] |
| 384     | 15.12 | 6 - 160 mm   6 1/3"  | 48                             | 10634 |
| 448     | 17.64 | 7 - 160 mm   6 1/3"  | 56                             | 12407 |
| 512     | 20.16 | 8 - 160 mm   6 1/3"  | 64                             | 14179 |
| 576     | 22.68 | 9 - 160 mm   6 1/3"  | 72                             | 15951 |
| 640     | 25.20 | 10 - 200 mm   7 7/8" | 80                             | 17724 |
| 704     | 27.72 | 11 - 200 mm   7 7/8" | 88                             | 19496 |
| 768     | 30.24 | 12 - 200 mm   7 7/8" | 96                             | 21268 |
| 832     | 32.76 | 13 - 200 mm   7 7/8" | 104                            | 23041 |
| 896     | 35.28 | 14 - 200 mm   7 7/8" | 112                            | 24813 |
| 960     | 37.80 | 15 - 200 mm   7 7/8" | 120                            | 26585 |

$C_d, C_M, C_T = 1$   
Specific gravity = 0.49

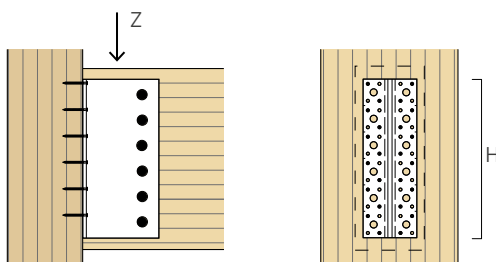
### OTHER CONFIGURATION AVAILABLE



ALUMAXI with SBD dowels and LBA nails - full nailing

## ■ ADJUSTED DESIGN VALUES | TIMBER-TO-TIMBER JOINT

### PARTIAL NAILING - CONNECTION WITH NAILS PARALLEL TO THE GRAIN



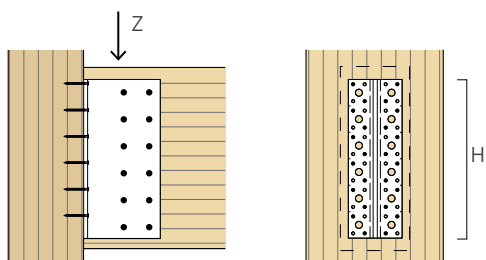
#### ALUMAXI with STA dowels and LBA nails - partial nailing

##### ASD DESIGN VALUES

| ALUMAXI |       | dowels               | nails                          | partial |
|---------|-------|----------------------|--------------------------------|---------|
| H       |       | STA Ø16 mm   0.63"   | LBA Ø6 x 60 mm   0.24 x 2 3/8" | Z'      |
| [mm]    | [in]  | [pcs. - L]           | [pcs.]                         | [lbs]   |
| 384     | 15.12 | 6 - 160 mm   6 1/3"  | 24                             | 6432    |
| 448     | 17.64 | 7 - 160 mm   6 1/3"  | 27                             | 7392    |
| 512     | 20.16 | 8 - 160 mm   6 1/3"  | 32                             | 8834    |
| 576     | 22.68 | 9 - 160 mm   6 1/3"  | 36                             | 10021   |
| 640     | 25.20 | 10 - 200 mm   7 7/8" | 40                             | 11201   |
| 704     | 27.72 | 11 - 200 mm   7 7/8" | 44                             | 12376   |
| 768     | 30.24 | 12 - 200 mm   7 7/8" | 48                             | 13546   |
| 832     | 32.76 | 13 - 200 mm   7 7/8" | 52                             | 14714   |
| 896     | 35.28 | 14 - 200 mm   7 7/8" | 56                             | 15880   |
| 960     | 37.80 | 15 - 200 mm   7 7/8" | 60                             | 17043   |

$C_d, C_M, C_T = 1$   
Specific gravity = 0.49

#### OTHER CONFIGURATION AVAILABLE



#### ALUMAXI with SBD dowels and LBA nails - partial nailing

##### NOTES:

- Download the latest version of this document from [www.rothoblaas.com](http://www.rothoblaas.com).
- Concerning the provisions of table 12.5.1F of the NDS: the space between the outer rows of bolts in a steel knife plate should be maximum 10" unless special detailing is provided to accommodate cross-grain shrinkage of the member.  
In dry timber, as proven by the many examples with dry glulam at 12%, the splitting of the timber section does not occur or it is not a structural issue.  
In case the ALU is inserted in wet timber, to mitigate the splitting of the timber member, it is possible to insert full threaded screws perpendicular to the grain.

##### GENERAL PRINCIPLES:

- Contact Rothoblaas' technical office for more information about the product.
- Dimensioning and verification of the timber elements must be carried out separately.
- Strength values of the connection system are valid under the calculation hypotheses listed in the table.
- All reference lateral design values are calculated in accordance with the NDS. The analytical model is outlined in ETA-09/0361.