Masonite Beams AB has been a pioneer of European based I-Joist manufacturing since 1974 and operates from its original location in Rundvik, Sweden.

In 2006 the company was bought by the Byggma Group, a Norwegian building products manufacturing group as part of a strategic move to strengthen its structural products portfolio. The group is comprised of 6 brands.

Its commitment to manufacturing was further underlined in 2008. After 4 years of research and development and an investment programme of £8m, the company opened a new ‘state-of-the-art’ I-Joist manufacturing plant with a production capacity of 24 million linear metres per year.

Lifetime Guaranteed Quality and Performance

Masonite Beams products are manufactured to precise tolerances in order to meet their published performance characteristics. These products are warranted to be free of defects in materials and workmanship, and to meet the expected design performance, if installed and used in accordance with the information provided in the Installation Guide, for the lifetime of the structure. Should you experience a problem which you believe may have been caused by these products then please contact our representatives who will help to resolve the issue.
In today’s construction industry, the issue of sustainability and minimising the impact on the environment are becoming increasingly important. Masonite operates a comprehensive environmental policy, which covers both the manufacture of its products and the sourcing of the raw materials used.

Manufactured in accordance with the environmental management system ISO 14001, Masonite I-Joists utilise wood fibre certified under PEFC with full chain of custody processes. The high efficiency of the ‘wood to I-Joist’ conversion process means that for a specific volume of Masonite I-Joists, far fewer trees are harvested than those required to produce an equivalent volume of solid sawn timber joists.
Masonite I-Joists

I-Joists are used as structural components in engineered timber floor, wall and roof systems. The majority of Masonite I-Joists are used as part of the Masonite Floor System.

The manufacturing facility in Sweden is supported by Södra in the UK with a first class, dedicated, experienced team handling sales, engineering and design, together with a comprehensive software package covering layout, engineering and cut optimisation.

Masonite I-Joists are a lightweight alternative to conventional timber members, offering time-saving and cost-saving solutions for floor, roof and wall construction to a wide range of private and public sector applications. Unlike traditional timber, which can warp, twist and shrink, Masonite I-Joists have a superior dimensional stability resulting in fewer costly site call-backs.

Masonite engineered timber I-Joists are comprised of slow-grown, high grade white wood flanges combined with OSB for the web. Masonite I-Joists carry the ETA certification and CE marking, together with PEFC chain of custody certification. Masonite I-Joists are manufactured in accordance with the requirements of ISO 9001 and the environmental standard ISO 14001. Masonite I-Joists are manufactured to a wide range of lengths to meet all structural requirements and are available in the following depths: 220mm, 240mm, 300mm, 350mm and 400mm.

NOTE:
The HL Joist is identified by a RED dotted line on the flange.

<table>
<thead>
<tr>
<th>STANDARD DEPTHS mm</th>
<th>HL</th>
<th>H</th>
<th>HM</th>
<th>HI</th>
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</table>

PRODUCT APPROVALS

[CE] [EOTA]
## MASONITE BEAMS TECHNICAL GUIDE – FLOOR APPLICATIONS

### DOMESTIC FLOORS – LOADSHARING (4 OR MORE JOISTS NO MORE THAN 610mm ON CENTRE) – SERVICE CLASS 1

| JOIST SERIES | DEPTH H mm | JOIST WEIGHT kg/m | FLEXURAL RIGIDITY EI N.mm² x10⁴ | SHEAR RIGIDITY GA Nx10⁶ | BENDING MOMENT kN.m | Vertical Shear kN | 45mm END BEARING kN | 89mm INTERMEDIATE BEARING kN | NO WEB STIFFENERS | NO WEB STIFFENERS |
|--------------|------------|-------------------|-----------------|-----------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|
| HL 220       | 2.99       | 303               | 1.253           | 2.14            | 5.54           | 4.03           | 10.13           |                 |                 |                 |                 |
| HL 300       | 3.59       | 650               | 1.888           | 3.13            | 7.53           | 4.03           | 10.13           |                 |                 |                 |                 |
| H 220        | 3.23       | 431               | 1.253           | 4.16            | 5.54           | 4.26           | 10.66           |                 |                 |                 |                 |
| H 240        | 3.38       | 535               | 1.412           | 4.64            | 6.04           | 4.26           | 10.66           |                 |                 |                 |                 |
| H 300        | 3.83       | 920               | 1.888           | 6.04            | 7.53           | 4.26           | 10.66           |                 |                 |                 |                 |
| H 350        | 4.21       | 1327              | 2.286           | 7.18            | 8.76           | 4.26           | 10.66           |                 |                 |                 |                 |
| H 400        | 4.58       | 1813              | 2.683           | 8.30            | 9.99           | 4.26           | 10.66           |                 |                 |                 |                 |
| HM 220       | 3.84       | 553               | 1.253           | 5.35            | 5.34           | 5.36           | 13.06           |                 |                 |                 |                 |
| HM 240       | 3.99       | 686               | 1.412           | 5.95            | 6.04           | 5.36           | 13.06           |                 |                 |                 |                 |
| HM 300       | 4.44       | 1178              | 1.888           | 7.72            | 7.53           | 5.36           | 13.06           |                 |                 |                 |                 |
| HM 350       | 4.82       | 1694              | 2.286           | 9.17            | 8.76           | 5.36           | 13.06           |                 |                 |                 |                 |
| HM 400       | 5.19       | 2311              | 2.683           | 10.58           | 9.99           | 5.36           | 13.06           |                 |                 |                 |                 |
| HI 220       | 4.31       | 647               | 1.253           | 6.26            | 5.54           | 6.16           | 13.33           |                 |                 |                 |                 |
| HI 240       | 4.46       | 802               | 1.412           | 6.96            | 6.04           | 6.16           | 13.33           |                 |                 |                 |                 |
| HI 300       | 4.91       | 1375              | 1.888           | 9.02            | 7.53           | 6.16           | 13.33           |                 |                 |                 |                 |
| HI 350       | 5.29       | 1977              | 2.286           | 10.69           | 8.76           | 6.16           | 13.33           |                 |                 |                 |                 |
| HI 400       | 5.66       | 2694              | 2.683           | 12.34           | 9.99           | 6.16           | 13.33           |                 |                 |                 |                 |
| HB 220       | 5.58       | 900               | 1.253           | 8.70            | 5.54           | 8.53           | 20.00           |                 |                 |                 |                 |
| HB 240       | 5.73       | 1116              | 1.412           | 9.67            | 6.04           | 8.53           | 20.00           |                 |                 |                 |                 |
| HB 300       | 6.18       | 1909              | 1.888           | 12.53           | 7.53           | 8.53           | 20.00           |                 |                 |                 |                 |
| HB 350       | 6.56       | 2740              | 2.286           | 14.82           | 8.76           | 8.53           | 20.00           |                 |                 |                 |                 |
| HB 400       | 6.93       | 3728              | 2.683           | 17.08           | 9.99           | 8.53           | 20.00           |                 |                 |                 |                 |

**NOTES:**

1) Permissible resistances are for Long Term duration (Kₚ = 1.00) and can be increased for duration of load using the appropriate Kₚ factor as defined in BS 5268-2.

2) Permissible resistances have already been multiplied by domestic floor adjustment factor K₆dom = 1.12 and loadsharing factor K₈ = 1.10.

3) Permissible moments assume full lateral support of the compression flange. Full support is considered to be a maximum unbraced length of 350mm for HL or H series, 500mm for HM, 600mm for HI and 1000mm for HM series.
### I-Joist Span Chart

<table>
<thead>
<tr>
<th>DEPTH mm</th>
<th>SERIES</th>
<th>400mm ccs</th>
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<td>4609</td>
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<td>6694</td>
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</tbody>
</table>

**NOTES:**

1. The maximum spans shown above are in metres and indicate the most restrictive single or multiple effective span applications.
2. The deflection restriction has been taken as the lesser of 0.003 x Effective span or 12mm in accordance with BS 5268.
3. The above table assumes load sharing i.e. joist are no more than 610mm centres.
4. Maximum spans assume that the joist flanges are adequately restrained laterally and that decking and ceiling are fixed to the joist in accordance with relevant British Standards.
5. Spans are calculated for the uniformly distributed loads indicated only. This figure allows for the dead load of a floor with a 22mm chipboard deck and 15mm plasterboard ceiling, an imposed loading of 1.5kN/m² (from BS 6399-1, for domestic floors) and a uniform allowance for lightweight partitions not exceeding 0.8kN/m run. For other conditions, contact your Södra Wood representative.
6. Minimum 89mm end bearing is assumed.
Glulam Beams are manufactured from 40mm laminations of Nordic Spruce to GL24H standard under EN14080.

Available in 12m lengths, Glulam Beams are the perfect complement to I-Joists as part of the Masonite Floor System.

<table>
<thead>
<tr>
<th>DEPTH mm</th>
<th>38mm</th>
<th>45mm</th>
<th>90mm</th>
<th>140mm</th>
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<tr>
<td>400</td>
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<td>✓</td>
</tr>
</tbody>
</table>
Notes:

1. Properties of horizontally laminated beams are calculated in accordance with BS5268-2, assuming 40mm laminates. Grade stresses are modified for number of laminates and beam depth but not load duration.
2. Design properties are for long term loading without load sharing.
3. Values apply only if lateral support of the compression edge is provided at not more than 600mm centres.
4. These values apply only to dry use conditions - i.e. SC1 and SC2.
Intermediate Floors

**TIMBER FRAME PARTY WALL JUNCTION**

Floor specifications to provide airborne sound reduction $R_w \geq 40\text{dB}$ (with deck adhesive system) and fire resistance $\geq 30\text{ minutes}$ (EN1365 Part2/3)

1. Plywood/OSB web filler blocks cut to fit between flanges, thickness to suit flange size, fitted both sides
2. 38mm glulam
3. 45mm glulam to carry plasterboard

**Notes:**
These details meet the requirements of Robust Details E-WT-1 and E-WT-2, for timber separating walls.

**MASONRY PARTY WALL JUNCTION**

Floor specifications to provide airborne sound reduction $R_w \geq 40\text{dB}$ (with deck adhesive system and fire resistance $\geq 30\text{ minutes}$ (EN1365 Part2/3)

1. Effectively seal the joist end with web stiffeners and sealant or a proprietary cap
2. Continuous horizontal ribbon of adhesive
3. Render
4. Masonry Hanger

**Notes:**
Junction details meet the requirements of Robust Details E-WM-1 to 8 inclusive, for masonry separating walls.

Illustration: concrete blocks, render and gypsum-based boards on dabs (E-WM-3, 4, 6 & 7).

Only use with masonry wall specifications in Part E Robust Details.

**STANDARD INTERMEDIATE FLOOR**

Floor specifications to provide airborne sound reduction $R_w \geq 40\text{dB}$ (with deck adhesive system) and fire resistance $\geq 30\text{ minutes}$ (EN1365 Part2/3)

1. Optional fitment of insulation
2. Fix ceiling lining in accordance with the plasterboard manufacturer’s instructions
3. Optional fitment of recessed light fittings. (These must have been assessed for 60 minutes fire resistance)
4. 22mm flooring-grade chipboard
5. 15mm standard wallboard

**Notes:**
Perimeter noggins may not be required for 15mm plasterboard ceilings, refer to manufacturer

Insulation (density 10–33 Kg/m³) may be required for sound insulation where alternative deck and ceiling constructions are used.

Insulation may be added to improve sound resistance.
Separating Floors

TIMBER FRAME EXTERNAL WALL JUNCTION

1. Masonry outer leaf
2. Cavity stop
3. Min. 50mm external wall cavity
4. 2 layers of gypsum-based board, nominal weight of 8 kg/m² per layer
5. Seal with tape or caulk with sealant
6. Min. 5mm foamed polyethylene resilient flanking strip
7. Min. 18mm T&G flooring board
8. Gypsum based board (13.5kg/m²)
9. Resilient batten
10. Mineral wool laid between battens
11. 15mm OSB subdeck
12. Min. 240mm Masonite I-Loist
13. Min. 100mm mineral fibre cased quilt (10-33 kg/m²)
14. Resilient bar
15. 2 layers of gypsum-based board, combined weight of 23kg/m², all joints staggered

TIMBER SEPARATING WALL JUNCTION

This is NOT a Robust Detail and therefore will be subject to Pre-Completion Testing (PCT) in England and Wales.

1. 22mm Chipboard flooring
2. Gypsum based board (13.5kg/m²)
3. 0mm thick mineral fibre (140 kg/m³)
4. 22mm Chipboard flooring
5. Min. 240mm Masonite I-Loist
6. Min. 100mm mineral fibre cased quilt (10-33 kg/m³)
7. Resilient bar
8. Requirements for intermediate floors, rim board, perimeter joists and blocking apply
9. Plywood/OSB web filler blocks cut to fit between flanges, thickness to suit flange size, fitted both sides
10. 2 layers of gypsum-based board, total nominal weight of 22 kg/m² both sides
11. Min. 18mm T&G flooring board
12. Gypsum based board (13.5kg/m²)
13. Resilient batten
14. Mineral wool laid between battens
15. 15mm OSB subdeck
16. Min. 240mm Masonite I-Loist
17. Min. 100mm mineral fibre cased quilt (10-33 kg/m³)
18. 2 layers of gypsum-based board, combined weight of 23kg/m², all joints staggered

Part E Robust Details
E-FT-1 (timber I-Joists) and E-WT1 (twin timber frames without sheathing board). Refer to Robust Details Part E handbook for detailed specifications.
Other Floor Information

FIRE RESISTANCE

Full 30 minutes

<table>
<thead>
<tr>
<th>DECKING</th>
<th>JOIST CENTRES</th>
<th>INSULATION</th>
<th>PLASTERBOARD</th>
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</thead>
<tbody>
<tr>
<td>22mm Chipboard</td>
<td>400, 480 and 600mm</td>
<td>Optional max density 35kg/m³</td>
<td>15mm standard wallboard of Gyproc or equivalent</td>
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Full 60 minutes

<table>
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<th>JOIST CENTRES</th>
<th>INSULATION</th>
<th>PLASTERBOARD</th>
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</thead>
<tbody>
<tr>
<td>22mm Chipboard</td>
<td>400, 480 and 600mm</td>
<td>Optional max density 35kg/m³</td>
<td>15mm fire resistant board with 12.5mm standard wallboard over of Gyproc or equivalent</td>
</tr>
</tbody>
</table>

The char rate of glulam beams is as per table 3.1 of EN 1995-1-2 (Eurocode 5 Part 1.2) at 0.65mm/min
Safety Bracing Details

**UNBRACED JOISTS ARE UNSTABLE!**

- Do not walk on or apply any materials to the joist area until the floor system is properly braced.
- The bracing should be removed in sequence as the decking is installed.
- The following represents a generic method of bracing a floor. Each system will be slightly different and the installer must ensure that all sections of the floor are accounted for.

**Notes:**

- Full depth I-joist blocking panels may be used instead of solid timber stability blocks.
- All blocks to be cut accurately and squarely to maintain spacing of joists.
- Additional blocks and bracings are required for any areas of joists running in opposite directions and for cantilevered joists (unless permanent closure piece is installed at this stage). Instal further sets of blocks and diagonals at a maximum of 12m centres in long runs of joists.
**A1 MASONRY WALL RESTRAINT — PERPENDICULAR TO JOIST**

1. Thin metal restraint strap installed in accordance with the manufacturer’s instructions
2. Min. 38 x 97mm nogging fixed to joists by skew nails

**A2 MASONRY WALL RESTRAINT — PARALLEL TO JOIST**

1. Restraint strap fitted to joist on non-restraint type masonry hanger
2. Parallel restraint straps may only be omitted if the joist has at least 90mm of direct bearing on the wall, provided that the height of the wall does not exceed 2 storeys
3. Restraint strap on built-in joist

**A3 PARALLEL PARTITION NOGGINGS**

1. Non-load bearing stud partition fixed to noggings (max. self-weight of partition 0.8kN/m run)
2. 38 x 75mm partition noggings supported by metal z-clips, nailed in accordance with the manufacturer’s instructions
3. Noggings may also be attached with two 3.35 x 65mm nails skew nailed at each end

**A4 PERIMETER NOGGINGS**

1. Noggings may be skew nailed to joists or supported on z-clips
2. Timber nogging fitted between joists to support free edges of decking at external or internal walls. Also applicable to masonry walls

**B1 I-JOIST BLOCKING PANEL**

1. Masonite I-Joist blocking panel
2. Joist has full bearing on timber plate

**B2 RIM I-JOIST**

1. Masonite I-Joist rim board
2. Joist requires 45mm minimum bearing

**B3 RIM BOARD**

1. 38mm Glulam or similar approved
2. Joist requires 45mm minimum bearing

**B4 MASONRY HANGER**

1. Perimeter nogging for decking support where required
2. Proprietary approved masonry joist hangers - web stiffeners may be required, see notes on page 16
3. Parallel restraint straps will be required with non-restraining hangers — see A2
ABC construction details

**B5 MASONRY WALL BEARING**

1. Joist end built into wall. Note some capping devices may require less than a full bearing to prevent fouling the cavity
2. Perimeter noggins
3. The joist bearing must be sealed to prevent air leakage. This may be achieved by the use of proprietary capping devices or end blocks fitted to the joist webs with sealant around the joist ends

**B6 PARALLEL TIMBER FRAME WALL**

1. Masonite I-joist with half bearing into wall
2. Rim board to suit wall load

**B7 INTERMEDIATE BEARING – LOAD BEARING WALL ABOVE**

1. Load bearing wall directly above wall below
2. Masonite I-joist blocking panels between joists

**B8 INTERMEDIATE BEARING – COMPRESSION BLOCKS**

1. Load bearing wall directly above wall below
2. Height of compression blocks = joist depth + 2mm
3. 38 x 89mm minimum softwood compression blocks

**B9 INTERMEDIATE BEARING – NO LOAD BEARING WALL ABOVE**

1. Web stiffeners where required

**B10 INTERMEDIATE BEARING – MASONRY WALL**

1. Perimeter nogging
2. Minimum 89mm bearing

**B11 INTERMEDIATE BEARING – DOUBLE BLOCKING**

1. Load bearing wall directly above wall below
2. Webs of blocking in line with edge of stud wall above and below

**B12 COLUMN WITH COMPRESSION BLOCKS**

1. Softwood compression blocks, min. 38 x 89mm, height = joist depth + 2mm
2. I-Joist blocking panels
3. Number of blocks to suit width of column above
ABC construction details

**B13 CANTILEVER SUPPORTING WALL**

1. I-Joist Blocking
2. 38mm Glulam
3. Structural cantilever must not exceed 600mm

**B14 REINFORCED CANTILEVER SUPPORTING WALL**

1. I-Joist Blocking
2. 19mm ply reinforcement on both sides of cantilevered joists, nailed at 150mm centres with 3.35mm dia. nails, 65mm long. Stagger nails when fixing ply both sides
3. Structural cantilever must not exceed 600mm

**B15 NON LOAD BEARING CANTILEVER**

1. I-Joist Blocking
2. 38mm Glulam
3. Max. cantilever length is 1200mm. No load applied on cantilever

**B16 WALLPLATE CONNECTION**

1. Top mount hanger
2. Timber bearing plate securely fixed to flange of steel beam/masonry wall (design of fixings by Building Designer)

**C1 I-JOIST TO SOLID BEAM CONNECTION**

1. Top mount hanger
2. Face mount hanger
3. Glulam beam
4. Face mount hangers which do not laterally support the joist top flange require web stiffeners

**C2 I-JOIST TO I-JOIST CONNECTION**

1. Top mount hanger
2. Filler block or proprietary metal clips must be installed with multiple joists
3. Backer block on hanger face only for double joist
4. Backer block both sides of single joist
5. Face mount hanger
6. Double I-Joist

**C3 I-JOIST TO I-JOIST CONNECTION –BACKERLESS**

1. Filler block or proprietary metal clips must still be installed with multiple joists
2. Approved hanger designed for use without backer blocks

Note that approved hangers which eliminate the need for backer blocks are available. See detail C3.
FILLER AND BACKER BLOCK SIZES
The length of backer and filler blocks should allow fitment of nails without splitting and are typically 300-600mm long.

<table>
<thead>
<tr>
<th>DEPTH mm</th>
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<th>350</th>
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WEB STIFFENER SIZES

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<th>300</th>
<th>350</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERIES</td>
<td>HL/ H</td>
<td>HM</td>
<td>HI</td>
<td>HB</td>
<td>HL/ H</td>
</tr>
<tr>
<td>Height</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>Thickness</td>
<td>18</td>
<td>25</td>
<td>30</td>
<td>44</td>
<td>18</td>
</tr>
<tr>
<td>Nails</td>
<td>3no 65mm</td>
<td>3no 65mm</td>
<td>3no 90mm</td>
<td>3no 65mm</td>
<td>3no 65mm</td>
</tr>
</tbody>
</table>

WEB STIFFENERS ARE REQUIRED IN THE FOLLOWING CASES:

- When a higher reaction value is needed at an internal support, refer to Engineering Support for more information.
- If the sides of the hanger do not laterally support the I-Joist top flange.
- When a concentrated load is transferred from above, the web stiffeners should be tight to the top flange (gap at bottom flange).
MULTIPLE PLY GLULAM MEMBERS - FIXING DETAILS

Allowable uniform load applied to multiple glulam beam kN/m

<table>
<thead>
<tr>
<th>FIXINGS</th>
<th>PLY THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 PLY MEMBERS</td>
</tr>
<tr>
<td></td>
<td>38mm</td>
</tr>
<tr>
<td>2 rows 3.00mm x 75mm long nails at 300mm centres</td>
<td>4.34</td>
</tr>
<tr>
<td>3 rows 3.00mm x 75mm long nails at 300mm centres</td>
<td>6.51</td>
</tr>
<tr>
<td>2 rows M12 bolts at 600mm centres</td>
<td>9.46</td>
</tr>
<tr>
<td>2 rows M12 bolts at 300mm centres</td>
<td>18.92</td>
</tr>
</tbody>
</table>

Notes:

1. Verify adequacy of beam to support applied loads.
2. Beams wider than 180mm require special consideration.
3. For 3 and 4 member assemblies nails should be driven from both sides into the centre piece.
4. Nails to be fixed 50mm from the edges & ends of the beam.
5. Bolts to be installed 75mm from the edge and 50mm from the ends of the beam.
6. All bolts to be fitted with steel washers, minimum 36mm diameter x 3mm thick.
7. All loads are assumed to be applied perpendicular to the grain on one face only.
8. Values apply to beams in service classes 1 and 2 only.

Table showing the maximum uniform load which can be applied to one face of composite glulam beams.
## Allowable Holes

### MASONITE BEAMS

**Unless otherwise stated:**
- All holes must be placed on the centre of the web.
- No holes are allowed in the safety zones.
- Holes must not extend into the flange material.
- Holes with diameter less than 20 mm can be placed anywhere in the web, but with a minimum distance of 40 mm between holes.
- One hole with diameter less than 40 mm can be placed anywhere in the web, except in the safety zones, if the general rules for hole spacing are followed.
- The maximum dimensions for rectangular holes are: \( a = 300 \text{ mm} \) and \( b = 200 \text{ mm} \).
- Placement restrictions and the maximum sizes of holes are shown in the diagram and table below.

### Diagram

#### Groups of holes are allowed provided that existing holes regulations are followed for a large hole enclosing them

### Table

<table>
<thead>
<tr>
<th>PRODUCT DEPTH mm</th>
<th>Maximum Hole Depth mm</th>
<th>Minimum Distance from Bearing or Point Load</th>
<th>Minimum Distance Between Circular Holes</th>
<th>Minimum Distance Between rectangular and other holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>126</td>
<td>ah</td>
<td>( 2 \times \text{larger of} (D_1 \text{ or } D_2) )</td>
<td>Larger of ( h ) or ( 2 \times a )</td>
</tr>
<tr>
<td>240</td>
<td>146</td>
<td>ah</td>
<td>( 2 \times \text{larger of} (D_1 \text{ or } D_2) )</td>
<td>Larger of ( h ) or ( 2 \times a )</td>
</tr>
<tr>
<td>300</td>
<td>206</td>
<td>ah</td>
<td>( 2 \times \text{larger of} (D_1 \text{ or } D_2) )</td>
<td>Larger of ( h ) or ( 2 \times a )</td>
</tr>
<tr>
<td>350</td>
<td>256</td>
<td>ah</td>
<td>( 2 \times \text{larger of} (D_1 \text{ or } D_2) )</td>
<td>Larger of ( h ) or ( 2 \times a )</td>
</tr>
<tr>
<td>400</td>
<td>306</td>
<td>ah</td>
<td>( 2 \times \text{larger of} (D_1 \text{ or } D_2) )</td>
<td>Larger of ( h ) or ( 2 \times a )</td>
</tr>
</tbody>
</table>

### Notes:

All values above are valid for uniformly distributed loads. Information regarding the calculation of the reduction of shear capacity caused by a hole can be found in Masonite Beams European Technical approval; ETA 12/0018. Any holes falling outside of these rules must be checked by our engineering support service.
GLULAM BEAMS
Based on BS5268

Notes:
Holes must be placed along the neutral axis and spaced apart at least 3 x largest diameter hole. For holes outside these rules please contact engineering support.

THESE CONDITIONS ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES
If in doubt, please ask for advice before you cut.

- **NO holes close to joist ends**
  Use hole chart for max. size & min. distance to wall.

- **NO notches in flanges of Masonite joists**

- **NO bevel cuts beyond the inside face of wall**

- **NO notches or holes in Glulam**
  Except as advised in hole chart for the product.

**Storage**
Always store joist packs flat, properly covered and above the ground.

**Handling**
Never store joist packs vertically.

Always follow the HSE guidance on manual handling.

Contractors should be aware of their health and safety responsibilities under the Construction (Design and Management) Regulations 2015.