

## The structural properties of Hyne 16C Glulam.

### Mechanical Properties

These Mechanical Properties have been determined in limit state form with a comprehensive testing and evaluation program carried out by Hyne Timber. The Modulus of Rigidity is calculated by using  $G = E/15$ . Density is a measured property and is determined as average Seasoned Density. However properties such as Bearing Strength (Perpendicular and Parallel to Grain), Shear Strength at Joint Details and Tension Strength (Perpendicular to Grain) are secondary properties dependent on the strength group of the material and are determined in accordance with AS1720.1-2010. Further Joint Group results are based on the material used, and the groups are defined based on species and density as per AS1720.1-2010.

| Product | Stress grade | Bending strength<br>( $F_b$ )<br> | Tension strength   |  | Shear strength  |  | Compression strength<br>( $F_c$ )<br> |
|---------|--------------|--|--|--|---|--|--|
|         |              |  | Parallel<br>( $F_t$ )<br> | Perpendicular<br>( $F_{tp}$ )<br> | In beam<br>( $F_v$ )<br> | At joint detail<br>( $F_{sj}$ )<br> |  |
| Beam 16 | GL16         | 38MPa  | 20MPa  | 0.5MPa   | 4.2MPa  | 4.2MPa   | 33MPa  |

| Product | Bearing strength   |  | Modulus of elasticity<br>(E)<br> | Modulus of rigidity<br>(G)<br> | Strength group | Joint group | Density<br> |
|---------|--|--|---|---|----------------|-------------|--|
|         | Parallel<br>( $F_p$ )<br> | Perpendicular<br>( $F_{pp}$ )<br> |   |   |                |             |  |
| Beam 16 | 30Mpa  | 10MPa  | 15,800MPa   | 980MPa  | SD6            | JD4         | 650KG / M <sup>3</sup>   |



## Capacity Factor

Values of capacity factor (F) for calculating the design capacity of (F R<sub>d</sub>) of structural members. Note that in this context, 'area' should be taken as the plan area.

Structural member in houses for which failure would be UNLIKELY to affect an area greater than 25m<sup>2</sup>; or SECONDARY member in structures other than houses:

F = 0.95

Structural member in houses for which failure would be LIKELY to affect an area greater than 25m<sup>2</sup>; or PRIMARY structural member in structures other than houses:

F = 0.85

Primary structural member in structures intended to fulfill an essential service or post disaster function:

F = 0.75

## Conductivity K

Where moisture content is below 25%, approximate thermal conductivity k across the grain can be calculated with a linear equation of the form:

$$k = G_x (B + Cx) + A$$

Where G<sub>x</sub> is specific gravity based on oven dry mass and volume at moisture content x (%) and A, B, and C are constants.

For G<sub>x</sub> > 0.3, temperatures around 24°C and x < 25% MC, the values of the constants are as follows:

- A = 0.01864
- B = 0.1941
- C = 0.004064 (k in W m<sup>-1</sup> K<sup>-1</sup>)

G<sub>x</sub> = 0.65

## Camber

Hyne Timber glue laminated (glulam) beams with a "C" postfix designates a vertical camber radius of 600m. An "S" postfix designates a straight beam profile.

Alignment tolerance of both straight and cambered beams shall be no more than 1mm per metre of beam length. Cambered beams are generally supplied with a marking stamped on the top edge of the beam. Unless specifically requested (such as for large cantilevers), cambered beams should not be installed with the camber arch facing downwards.

