



**Magna
Glulam**

**Predictable Strength and
Natural Beauty of an
Outstanding Quality Hardwood**

LumberBank



**Magna Glulam multipurpose
durable hardwood**

Durability recommendations weather-exposed applications	2
Site handling, installation, and protection	4
Laminated timber, what is checking and delamination	6
Warranty	10

Durability recommendations weather-exposed applications

To ensure optimal performance of Magna Glulam in external above ground applications, it is recommended to follow the specific guidelines provided by Magna Glulam and gain the cooperation of designers, builders, and owners. Mere compliance with building regulations is not enough to ensure a satisfactory design life for Magna Glulam Timber Products. Therefore, it becomes essential to prioritise durability during the design and construction of timber structures. To achieve this, it is important to focus on the following key aspects:

Designer responsibilities

- Apply effective building design and detailing practices to prevent water retention and accumulation in timber joints, including the use of suitable end caps and ventilation.
- Specify high-quality protective finishes and adhere to the recommendations provided by coating manufacturers regarding their usage.
- Incorporate an inspection and maintenance program based on exposure levels and the specifications provided by coating manufacturers.
- Give special attention to surfaces directly exposed to sunlight and recommend owners conduct more frequent inspections and maintenance.

Responsibilities of the builder

- Ensure that the timber remains dry and in good condition by following the on-site handling and protection guidelines.
- Apply an appropriate coating to seal any newly exposed surfaces resulting from cuts, notches, drill holes, and joints.
- Promptly address any damage to the coating or stain protection.
- Select fasteners/fixings with a durability that matches the design life of the chosen Magna Glulam timber product, taking into account the building's location relative to the specified zones. i.e. coastal and hazard zones.

Owner Responsibilities

- Adhere to Magna Glulam's inspection and maintenance program, incorporate the guidance of the designer, builder, and surface coat manufacturer.
- Perform maintenance inspections at least once a year, or more frequently for areas directly exposed to weather, with special attention to joints, fasteners, end grain capping, beam lamination points, and other horizontal surfaces that tend to accumulate water.

Good Design and Detailing

Implementing good detailing practices reduces the ongoing reliance on protective finishes for timber structures. The following practices enhance the durability performance of exposed Magna Glulam Timber products:

- Use arrised or round edges on beams to minimize cracks/checking and coating failures on sharp edges.
- Shield the Magna Glulam timber product from free forming moisture or direct sun by using code-compliant caps on exposed ends to maintain an unstressed dry condition.
- Utilize code-compliant damp proof membranes when the Magna Glulam timber product may come into contact with moisture through porous masonry or concrete.
- In order to prevent the moisture content of the Magna Glulam Timber product from reaching or exceeding an Equilibrium Moisture Content of 25% for prolonged periods and to avoid moisture gradients, it is crucial to incorporate suitable ventilation into the design of all beams/posts.

Joint Detailing Recommendations

- Minimize horizontal contact areas in favour of self-draining vertical surfaces.
- Ventilate joint surfaces using spacers whenever possible.
- Select compatible fasteners with sufficient corrosion protection and that do not cause splitting during installation (e.g., hot-dipped galvanic coatings or stainless steel).
- Ensure any moisture entering a joint can adequately drain away from the joint.
- Account for thermal expansion/contraction in joint design.
- Utilise building overhangs and other structures to protect the Magna Glulam Timber product from excessive moisture and sun exposure.

Good Construction Practices

Proper protection of Magna Glulam Timber Products prior to and during installation is crucial. For recommendations on storage and handling, please refer to the Magna Glulam Timber on Site Handling, installation, and protection Guide.

Premium Quality Protective Finish

It's recommended that exposed Magna Glulam Timber products be treated with a protective finish suitable for their specific exposure conditions. We recommend an Oil Based stain or paint for your product. An oil-based stain penetrates deep into the timber to protect from the inside out. They're a water repellent coating which means there's no chance of cracking or flaking, polyurethane coatings are not recommended. These coatings tend to crack and deteriorate easily, requiring frequent reapplication. Unlike oil protection, a polyurethane creates a film over the timber, lacking oils deep penetration for optimal preservation, always follow the manufacturers recommendations and please refer to the Magna Glulam Timber on Site Handling, installation, and protection section of this guide.

Magna Glulam Checking and Delamination

When designing and constructing timber structures, it is important to take into account that timber is an organic material with its own inherent characteristics. One particular aspect to consider is the impact of changes in moisture content, which can lead to surface checking, or seasoning checks. In the case of Magna Glulam made from Merbau/Kwila Timber, it has remarkably low shrinkage rates of 1.5% radial shrinkage and 2.5% tangential shrinkage. These low rates of shrinkage help to keep Magna Glulam straight even in varying weather conditions. Moreover, the low shrinkage also reduces the likelihood of surface cracking when compared to other types of timber. please refer to the Magna Glulam, Laminated Timber, Checking & Delamination Guide

Site handling, installation, and protection

Fixing Systems for Posts & Beams

For installing Magna Glulam Posts and Beams, the use of standard proprietary connections, fastenings, and hardware, or fully engineered design componentry is acceptable, depending on your intended use. When utilizing specific design connections, ensure they are designed, detailed, and installed in accordance with the provided design documentation.

For suitable applications, you can use proprietary plates, timber connectors, fasteners, fastening systems, anchors & brackets from any one of the recognised suppliers i.e. Simpson Strong-Tie, MiTek, Pryda, all offer detailed resources to assist with installation. The design of the posts, beams, and associated hardware componentry should consider the product's use in terms of climate zone, exposure, and required durability.

Appropriate Skills Required

For any building work, the installation or supervision of all Magna Glulam products should be carried out by a Licensed Building Practitioner (LBP) holding a Carpentry 1 Certificate. If the construction is based on specific design, following AS NZS 1170, the work may be overseen or supervised by an IPENZ Registered Structural Engineer familiar with Magna Glulam design.

Keep it dry

Correct on-site storage of Magna Glulam prior to installation is critical.

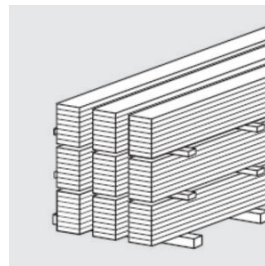
- MUST remain dry at all times prior to installation.
- MUST be stored on a flat surface off the ground, on bearers 150mm above ground, supported every one metre undercover.
- BEST Practice for optimal results, when installing Magna Glulam indoors it is recommended to store the product on-site for a minimum of 5 days. Remove the protective wrap to allow the timber to acclimate to its surroundings and achieve equilibrium.

Note: To help ensure a proper fit and prevent any issues with the installation process. It is important to properly acclimate the timber to the installation environment before proceeding with any construction. Additionally, it is recommended to store the timber in a dry, well-ventilated area to prevent any further moisture absorption. By following these guidelines, you can ensure the success and longevity of your Magna Glulam products.

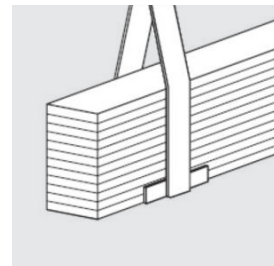
Handling

Magna Glulam products should not be dropped, jarred, or dragged. It's important to take care to prevent surface damage. When loading, unloading, or transporting, protection should be used against strops, chains, or wire ropes. We recommend using webbing slings to avoid damaging the members, and the product should be lifted on its edge to align it with its final position.

Where applicable, use spreaders on long members and position slings to ensure a well-balanced load and support. Guy lines should be used to control the product during movement. During transport and erection, care should be taken not to over-stress Laminated timber.



Stacking



Unloading



Weather protection

Magna Glulam multipurpose durable hardwood

Storage

Merbau has very low shrinkage rates (1.5% radial & 2.5% tangential) which mean that Magna Glulam stays straight in changing weather conditions. It also means that Magna Glulam is much less prone to surface cracking than other timbers.

Magna Glulam are kiln dried to 12–16% prior to gluing to insure beams and posts have the same moisture content from core to the surface. This factor makes Magna Glulam less prone to distortion and moisture sweating than solid timber in large sections.

Before installation, all Magna Glulam components should be stacked on level bearers, with at least 150mm clearance from the ground. If Magna Glulam products come with protective wrapping, retain the wrap for as long as possible during the construction process. If the products have been factory sealed or pre-stained, the coating is designed for short-term protection during the construction period, ongoing maintenance of exposed Magna Glulam beams is required to protect against the elements and to preserve the desired finish.

Long term exposure of the Magna Glulam to moisture which causes the equilibrium moisture content of the timber to increase over 25% for prolonged periods, will fall outside the requirements of the warranty.

Protecting Magna Glulam

Coatings are essential to give your Magna Glulam timber the protection it needs to stay in great condition. Coatings form a layer to protect your timber, prevent exposure to the elements and keep your Magna Glulam looking as intended, follow the recommendations of a timber coating specialist for what best product suits both the product and application.

While we can recommend Dryden Coatings (www.dryden.co.nz) as a reputable supplier known for their high-quality coatings, we also recommend exploring other suppliers in the market to ensure you find the best fit for your specific requirements. Consider factors such as product range, pricing, customer support, and industry reputation when evaluating suppliers.

Laminated timber, what is checking and delamination

Magna Glulam Laminated timber

Timber is a natural material, so its inherent characteristics must be taken into account when designing and constructing wooden structures. Magna Glulam laminated timber is an engineered wood product utilised in various construction purposes like floor beams, ridge beams, window and door headers, columns, and trusses. Both in commercial settings and home construction, Magna Glulam beams and posts are often favoured for their aesthetic appeal in exposed designs such as rafters in vaulted ceilings or long clear-span ridge beams. Since Magna Glulam members play a prominent role in these open & exposed designs, the seasoning characteristics, commonly known as “Checking” become more noticeable.

Surface checking in Magna Glulam beams

Surface checking occurs in timber members due to differences in moisture content between the core and the surface. This is especially the case in large Magna Glulam beams consisting of wood with high moisture content, as surface drying can induce local shrinkage, generating perpendicular-to-grain tensile stresses. Consequently, these can result in splitting along the grain, with larger members possessing a greater potential for such an issue. Checking can occur along the side of a Magna Glulam beam or at the ends, with the latter being more vulnerable due to rapid drying through the end grain.

Magna Glulam made from Merbau/Kwila Timber has very low shrinkage rates (1.5% radial & 2.5% tangential) which mean the Magna Glulam stays straight in changing weather conditions. It also means that Magna Glulam is much less prone to surface cracking than other timbers.

The small pieces of Kwila used to make Magna Glulam are kiln dried to 12–16% prior to gluing which means that even the biggest beams and posts have the same moisture content from core to the surface. This factor makes Magna Glulam less prone to distortion and moisture sweating than solid timber in large sections.

Example of solid timber checking (Softwood) Example once the timbers has equalised: Example of end checking contained within lamination of a Glulam.



Example of solid timber checking (Softwood)



Example once the timbers has equalised



Example of end checking contained within lamination of Glulam

Effect of checks on strength

In the case of a Magna beams or posts, structural consideration for checks only arises when it converts into a complete split that extends the entire height of the beam or post on both sides (as depicted in Figure 2). This particular scenario is quite uncommon, but if it does occur, the length-to-depth ratio used in the beam's design should be adjusted accordingly. To confirm the structural capacity of the beam, it is essential to consult a qualified design professional. It's worth noting that a partial check, as illustrated in Figure 2, does not pose any significant structural concerns.

In bending members (Beams, rafters etc) checks are commonly observed on the face of the bottom lamination, on the side of the member, and at the end of the members. (Figure 3)

Identification of checking

Checks in glue-laminated timber typically manifest as transverse separations or openings which follow grain direction. (Figure 1) This results from differential shrinkage among individual laminations concentrated at glue lines. These checks should be distinguished from delamination's, which occur when the adhesive bond is inadequate and manifest as smooth wood surface separations, potentially darkened by the adhesive film, or as glossy adhesive surfaces with no torn wood fibres.

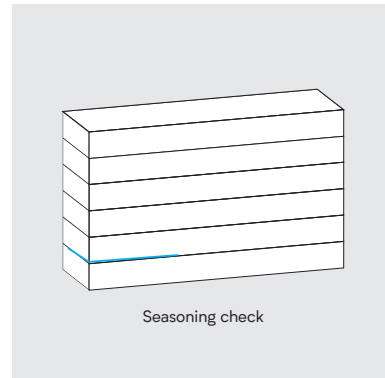


Figure 1

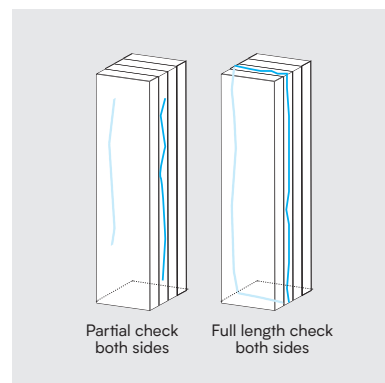


Figure 2

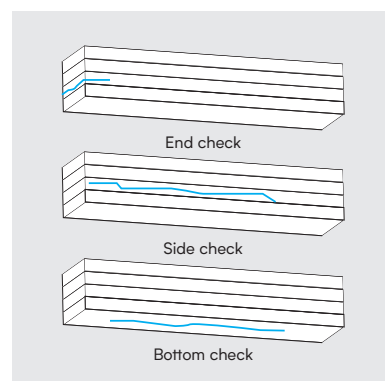


Figure 3

Repairing Glue-line cracks

It is quite common for glue-lines to open slightly at the surface due to changes in humidity. This is not to be confused with de-lamination which will open glue lines to a much greater extent. While it may be frustrating to wait to do this, we do recommend you wait for the structure to go through at least one full heating and cooling cycle, so you know as much as possible about what you are dealing with. (Winter — Summer) All fine cracks and some localised de-laminations can be repaired using an epoxy glue. Consult your distributor if in doubt and follow the recommendation of the manufacturer. Take extra care to keep Magna Glulam well coated on the more exposed sides.

A popular option is to use a marine-grade epoxy adhesive, as it offers excellent resistance to moisture, temperature fluctuations, and UV damage. This type of epoxy is typically designed for outdoor use and can provide a reliable bond for kwila Magna Glulam, even in challenging conditions.

To ensure the best results, we recommend consulting with professionals at your local hardware store or reaching out to suppliers knowledgeable in adhesive products. They can provide specific recommendations based on your project requirements and the available epoxy glues in New Zealand.

Repair of cracks not on glue-lines

Whilst Kwila is much less prone to surface cracking than most timbers, cracks can arise in exposed conditions if the surfaces are not regularly oiled or painted. Surface cracking is natural feature of timber and consequently is never the fault of the manufacturer. Surface cracks can also be filled using epoxy glue.

How can I prevent cracks in my Magna Glulam?

Preventing cracks in Magna Glulam can be challenging, as there is no guaranteed method to avoid them completely. However, there are precautions you can take to protect your Magna Glulam. Firstly, during transportation, storage, and installation, it's important to protect the Magna Glulam from extreme temperatures, humidity, and direct moisture.

To reduce the occurrence of cracks, you can apply finishes, stains, and varnishes to the Magna Glulam. These coatings create a barrier that hinders the movement of moisture from the timber. For enhanced protection, it is recommended to apply a thicker protective layer. Additionally, it's advisable to apply an appropriate sealer to all exposed end grain and, if externally exposed, use a protective capping or flashing.

Once the building is watertight, it's important to allow the Magna Glulam beams time to adjust to the in-service conditions. Rapid drying out should be avoided if possible. This will help minimize the risk of cracks forming. Keep in mind that while these precautions can help mitigate the likelihood of cracks, they cannot completely eliminate the possibility.



Magna Glulam Timber Products Warranty:

The manufacturing of Magna Glulam adheres to the AS/NZS 1328:1998 standards.

Magna Glulam provides a warranty for their Magna Glulam Timber products, guaranteeing compliance with the NZ Building Code for a minimum of 50 years, subject to the following conditions:

1. Proper storage on site: The warranty applies when the Magna Glulam timber is stored in accordance with the provided instructions.
2. Installation: The warranty remains valid throughout the installation process, assuming strict adherence to all recommended procedures.
3. Upon successful completion of the installation process, provided that all prescribed installation and protection instructions have been diligently followed, Magna Glulam guarantees the continued compliance of their Magna Glulam timber products with the provisions outlined by the NZ Building Code.

It is important to note that Magna Glulam's warranty is contingent upon taking necessary precautions to prevent moisture exposure to the Magna Glulam timber.

Magna Glulam is always supplied in appearance grade A which means it is free of knots and other defects and is smoothly dressed ready for clear coating or painting.

In the unlikely event of visual defects upon delivery, Magna Glulam will rectify the issue by either repairing or replacing the product at no additional cost. However, it is essential to inspect the product before installation, as this warranty only covers pre-installation defects.

If a product fails to meet the warranted condition, Magna Glulam will replace it free of charge or provide a refund. However, the responsibility for removing and reinstalling the Magna Glulam product lies with the installer. Please be aware that any additional losses or damages resulting from a product failure are not covered by Magna Glulam's warranty.

Exclusions

This warranty explicitly excludes any form of special, indirect, incidental, or consequential damages, including, but not limited to, lost profits, emotional distress, multiple damages, punitive damages, or exemplary damages. Under no circumstances shall Magna Glulam's liability exceed the actual amount received by Magna Glulam for the provision of the defective materials.

This warranty is non-transferable, all warranties cease to be valid upon the transfer or relocation of the installed product or the installation location. This warranty does not affect any statutory rights provided by law.

To initiate a warranty claim, proof of the date of purchase must be provided along with evidence of product failure. All claims must be submitted within 30 days of discovering the issue and are subject to inspection by Magna Glulam and/or an authorised representative. This warranty does not cover issues resulting from improper design, defective use, or the movement of attached materials that attribute to a structural failure. Acts of God, such as earthquakes, cyclones, floods, tsunamis, and other severe conditions, are not covered. Issues arising from failure to adhere to recommended storage, maintenance, and care guidelines will not be warranted. Normal wear and tear are also not covered by this warranty.

Magna Glulam reserves the right to supply a similar replacement product if the original product is no longer manufactured. The replacement value of the product will be determined based on its age and the corresponding depreciation. The value of the product will be reduced proportionally to the remaining lifespan of the product.

Disclaimer

Please note, all information provided is intended to serve as a helpful guide. It is essential that you also refer to the specific manufacturer's product information and installation material. Additionally, consulting with your installer is advisable for accurate information tailored to your specific situation.



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