Timber and Modern Methods of Construction – Control of Moisture

Moisture management is a critical factor influencing the durability, safety, and long-term performance of mass timber structures. Improper moisture control can lead to structural degradation and mould growth, all of which compromise building integrity.

This Loss Prevention Standard provides guidance on reducing the risks of moisture related damage to engineered timber materials.

Version: 1.0
Date: 31st July 2025

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Introduction

Engineered timber products such as Cross-Laminated Timber (CLT) and Glue-laminated timber (Glulam) are increasingly being integrated into both traditional and modular construction frameworks, offering renewable, low-carbon alternatives to steel and concrete.

Improper moisture control in relation to such materials can however lead to structural degradation, mould growth and potential insurance claims.

This Loss Prevention Standard outlines the key risks associated with moisture in mass timber construction and provides a framework for effective risk identification, mitigation, and monitoring.

Understanding the Risks

Timber products can withstand surface wetting, usually attributed to rainwater, snow, escape of water from pipework or excessive humidity, provided the ventilation is adequate. Where water is in contact with timber products for protracted periods and ventilation is inadequate, moisture can be absorbed, potentially leading to moisture-induced problems, which include:

- **Construction Phase**. Timber can absorb water during the construction phase if not adequately protected, leading to potential structural issues.
- **Decay and Mould Growth**. When exposed to high moisture levels over time, timber becomes susceptible to fungal decay and mould.
- **Structural Integrity**. Excess moisture, or over drying of moist materials can cause swelling, warping, desiccation or delamination in engineered timber products. This can compromise the load-bearing capacity and stability of the structure.
- **Adhesive and Fastener Performance**. Moisture can degrade adhesives and cause corrosion in fasteners, weakening connections.
- **Thermal and Acoustic Performance**. Moisture affects the insulating properties of timber. Wet wood has lower thermal resistance, which can reduce energy efficiency.

Whilst mass timber structures are often incorrectly assumed to resist moisture damage, surface mould, degradation and fungal contamination can all occur. Modular systems can trap internal moisture if ventilation systems are not activated post-installation.

Moisture problems during the construction phase often do not show symptoms immediately, e.g. decay, fungi etc., but can manifest months or even years later, requiring costly remedial works.

Managing the Risks

Formalise a moisture management plan that includes identification, monitoring and response strategies throughout all stages from design through to project completion.

This should be incorporated within the water emergency response plan.

Manufacturing Process

- Target moisture levels to be agreed with the supplier.
- Suppliers should verify moisture content is within acceptable and agreed moisture content parameters via certificates, or moisture content testing records.
- Materials and/or modules etc., should be supplied in fire retardant and weatherproof temporary coverings.
  - ✓ In the United Kingdom temporary coverings should comply with **LPS 1207: Requirements for the LPCB approval and listing for fire performance of temporary protective covering materials for use in the interior of buildings**.

Delivery to Construction Site

- Upon arrival at the site, check weatherproof packing materials, temporary coatings and edge sealants that were applied for storage and transit are in good order with no evidence of water exposure. Reject any loads that appear to have been exposed to rainwater.
- Minimise staging needs and moisture exposure risks by scheduling deliveries to coincide closely with installation.

Storage on Site

- Store timber in covered areas and raised from the ground to prevent direct contact with standing water and to assist with ventilation.
- Monitor moisture levels weekly or immediately after wet/humid weather to ensure moisture levels are satisfactory and temporary coverings remain in place.

During Construction

- Use weatherproof coverings or membranes to shield timber. Ensure suppliers' temporary coverings or waterproofing has sufficient lifespan and are not exceeded. If this is likely, weatherproofing **must** be replaced prior to expiration.
- Apply protective layers to timber with waterproof sealant, ensuring application to end grain sections where applicable and that exposure to the elements does not exceed the timeframe where the sealant prevents moisture ingress.
- Monitor the moisture content of materials and respond promptly to any signs of moisture exposure. Integrated moisture and humidity detection devices should be used to assist with this.
- Thermographic cameras should be used to inspect installations before enclosure, e.g., before cladding or sealing, following rain/high humidity events etc., to check for water ingress and to verify the integrity of sealed joints, connections, and interfaces.
- Ensure key personnel are trained in moisture management techniques and understand the importance of protecting materials from moisture.
- Activate permanent heating and ventilation systems as soon as possible.

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Sources and Useful Links

- The Construction Insurance Risk Engineers Group (CIREG).
- The Fire Protection Association.
- LPS 1207: Requirements for the LPCB approval and listing for fire performance of temporary protective covering materials for use in the interior of buildings
- Structural Timber Association Moisture Management Strategy
- The Joint Code of Practice on the Prevention and Management of Escape of Water on Construction Sites and Buildings Undergoing Renovation

Note: Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

Additional Information

Relevant Aviva Loss Prevention Standards include:

- **Mass Timber - Planning and Design (RIBA 0-4)**
- **Mass Timber - Construction (RIBA 4-6)**
- **Mass Timber - Handover and Use (RIBA 6-7)**
- **Mass Timber Strategy Guidance - Latent Defects Insurance**
- **Escape of Water on Construction Sites**

To find out more, please visit Aviva Risk Management Solutions **or speak to one of our advisors.**

Email us at riskadvice@aviva.com or call 0345 366 6666.*

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31st July 2025

Version 1.0

ARMSGI3282025