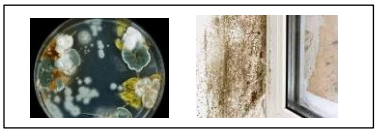
National Centre for Timber Durability and Design Life

Queensland Government | Forest & Wood Products Australia | The University Of Queensland | UniSC Australia

Mould: A type of opportunistic fungi ubiquitous in the environment. Given suitable conditions, they can grow on a wide range of materials. Mould is often a sign of poor moisture control.



Conditions for Mould Growth

- **Moisture**: Mould thrives in environments where moisture levels exceed 20%. Maintaining the moisture content of wood below 16-18% during storage, installation, and use is recommended.
- **Temperature**: Most mould species thrive in temperatures ranging from 15°C to 30°C. However, certain types can grow in conditions as low as 5°C or as high as 40°C
- **Nutrients**: Timber provides organic material for mould growth.
- **Poor Ventilation**: Stagnant air encourages mould development.

Key Vulnerable Areas

1. **During Construction**: Timber exposed to rain or high humidity before being sealed into the building envelope.
2. **Joints and Connections**: Areas prone to water ingress due to improper sealing.
3. **Bathrooms, Kitchens**: High-humidity areas without adequate ventilation.
4. **Facade Systems**: Insufficient detailing (poor design or execution of joints, flashing, or drainage system) can lead to moisture accumulation.

Why Mould is an Issue in Timber Construction

1. **Health Concerns**:
   - Mould growth can lead to poor indoor air quality and health risks, such as respiratory problems and allergies.
2. **Aesthetic appearance**:
   - Mould on timber varies in colour based on species, with dark moulds often leaving permanent stains. This can affect aesthetics and raise concerns about durability and health, even after cleaning or sanding.
3. **Structural Integrity**:
   - While mould primarily affects the surface of the timber (and does not affect the structure), prolonged exposure to moisture can also lead to decay fungi, which compromise structural strength.

Mitigation Strategies

1. Material Protection

- Use mould-resistant coatings or preservatives during manufacturing.
- Apply breathable yet moisture-resistant membranes to prevent water ingress while allowing drying.

2. Design and Construction Practices

- **Ventilation**:
  - Design systems to allow proper airflow, particularly in concealed spaces.
- **Moisture Management**:
  - Incorporate flashing, drip edges, and slope detailing to channel water away.
  - Avoid water traps by proper joint and edge sealing.
- **Construction Sequencing**:
  - Store timber off the ground (on Gravel or concrete pad) and under cover to minimize exposure during construction.
  - Use temporary weatherproofing measures for mass timber elements.

3. Maintenance and Monitoring

- **Post-Occupancy**:
  - Regular inspections to identify and address potential moisture ingress.
  - Educate building managers and occupants on managing indoor humidity levels.
- **Sensors**:
  - Install moisture sensors in critical areas to monitor and mitigate risks proactively.

4. Mould Removal and Control

Cleaning mould with **cationic surfactants** is recommended due to their specific chemical properties and efficacy in eliminating mould and mildew. Here's why:

- **Antimicrobial Properties**

Cationic surfactants, such as **quaternary ammonium compounds (quats),** have strong antimicrobial action. They can disrupt the cellular membranes of mould spores, effectively killing the mould and preventing regrowth.

- **Surface Activity**

Cationic surfactants are highly effective at adhering to surfaces. This ensures the cleaning solution remains in contact with the affected area longer, enhancing mould removal and leaving a protective barrier against re-infestation.

- **Non-Corrosive**

Compared to some alternative cleaning agents (like bleach), cationic surfactants are typically less harsh and less likely to damage materials such as timber, making them ideal for delicate surfaces.

- **pH Neutral or Slightly Alkaline**

Most cationic surfactants work well at neutral or slightly alkaline pH levels, which is gentle on surfaces but still effective against mould, as it thrives in acidic or nutrient-rich conditions.

- **Residue that Inhibits Mould Regrowth**

Some cationic surfactants leave a residue that can deter mould from regrowing, extending the time before another cleaning is necessary.

It is important to note that despite cleaning and sanding, mould stains may sometimes persist. However, if the mould is no longer active, the stain itself does not pose a health risk or compromise the structural integrity of the wood.

Standards and Guidelines

- Reference standards such as **AS 1684** (Residential Timber-Framed Construction) or **AS 1720.5** (Timber Structures – Design for Durability).
- Follow design principles outlined in **WoodSolutions Design Guides** https://www.woodsolutions.com.au/publications

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For further details and questions, please contact:

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ABOUT: *The National Centre for Timber Durability and Design Life aims to be a global leader in timber durability and design life research whilst developing the next generation of timber research scientists.*

An innovative partnership between industry, academia and government, the centre is supported by the Federal Government, Forest and Wood Products Australia, University of the Sunshine Coast, University of Queensland and Queensland Department of Primary Industries.