TEKNOS

Paint with Pride

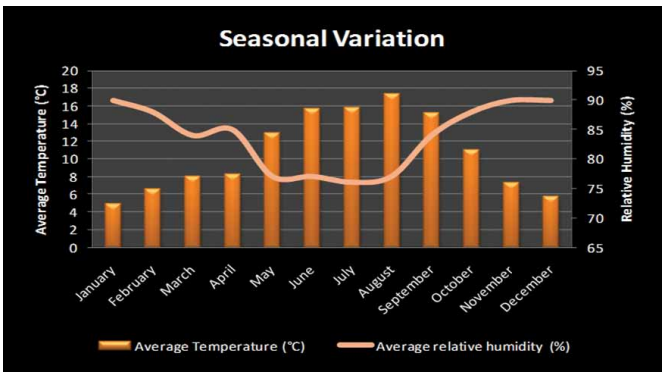
Winter Painting Problems
guidance notes

Almost 80% of problems related to factory finished joinery result from items manufactured and supplied during winter months, typically from December to March

Background

Most site problems are related to either one or a combination of two factors:

- low temperatures; which affect the drying and curing of the coating system
- High humidity; which causes dimensional movement in the timber, opening joints to moisture and causing door sets and windows to "stick"



UK and Ireland: Average seasonal variation in temperature and humidity

Rectifying these issues on site adds cost, with contractual disputes, site inspections and delayed

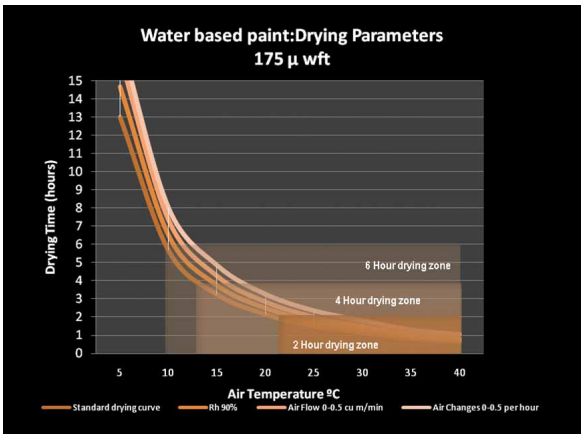
payments causing frustration for all the parties involved.

This note summarises some simple steps which can be taken during joinery manufacture, on site and in the construction phase which can greatly reduce and in most cases avoid the problems associated with winter conditions.

Factory painting and drying

Modern coating systems dry and cure in two stages. In the first stage, "coalescence", water and solvent is removed from the wet film, though they become dry to the touch before all the water has evaporated.

The graph below shows a typical coalescence curve for water based acrylic paint. At lower temperatures, and with poor airflow, times are significantly extended and even though the paint may feel dry, it will still hold significant moisture.



The coalescent phase is critical to performance. If joinery is exposed before the paint is fully dried blistering can occur, particularly in cold weather.

The second stage is "curing" when the coalesced film chemically cross links, increasing toughness and adhesion. In summer, full cure is achieved in a few days, but in winter the process slows, stopping completely close to freezing point, though restarting as temperatures rise.

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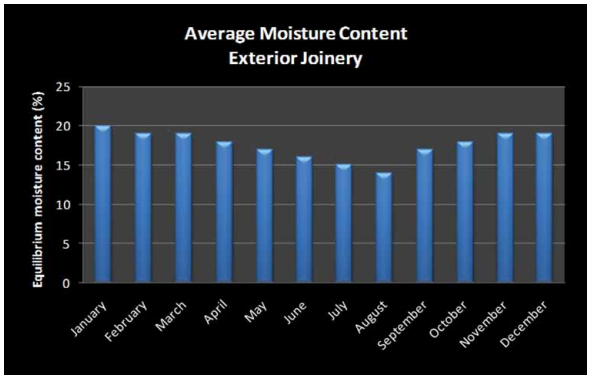
Practical steps in the factory

Achieving full coalescence of each coat of paint before joinery is shipped is key to avoiding complaints and some simple steps will help:

- Keep paint in a heated store before use and never leave paint cans on a cold concrete floor.
- Follow the film thickness specification. Over application is wasteful and slows the drying process.
- Try to maintain a warm temperature of 15-20°C in the drying area, using a background heater or ducted, filtered, warm workshop air.
- Avoid switching off heat or air circulation fans overnight. In cool, still air very little drying will take place.
- Avoid trying to accelerate drying by blasting hot air at joinery items. This will speed up surface drying, but trap moisture in the film and slow down the coalescence process.
- Delay wrapping finished joinery for as long as possible. Wrapping and storage in an unheated despatch area will slow or stop mois- ture release from the film, preventing full coalescence.

Timber moisture content

The ambient moisture content of exterior joinery varies significantly through the year and this is generally independent of any treatment or finishes applied to it.



Dimensional change is a function of species and grade, but broadly timber dimensions vary by about 1% for every 3% change in moisture content.

In winter, it is not untypical for joinery to leave the factory at around

10% moisture content, then rapidly condition to 18-20% on site, resulting in dimensional changes of 3–4%, causing joints to open and moisture to penetrate unprotected end grain and rebates.

Modern building standards create further problems with buildings lacking ventilation to extract excess moisture from finishing processes. Though dry processes are now widely used, gypsum plaster and concrete screed ground floor slabs are still common. For each bag of plaster between 15 and 17 litres of water need to be extracted and for each square meter of concrete screed between 180 and 200 litres of water. As buildings dry out, joinery items such as doors and windows become a primary route for vapour transmission which can cause blistering and delamination problems with the paint finish.

Practical steps in the factory

Store timber in a well ventilated, covered, external area to allow it to equilibrate with ambient conditions and to avoid over drying

Practical steps on site

- Remove airtight packaging, prior to storage, to allow free ventilation of the joinery.
- Store joinery off the ground on suitable bearers and cover with a
- permeable sheet to protect from contamination.
- Storage areas should be well ventilated and not subject to extremes of temperature. Avoid unsuitable storage such as metal box containers and areas open to the elements. These may be subject to condensation and very high temperatures in direct sunlight. Water can also collect in protective wrapping leading to saturation of some components.
- If joinery is installed prior to completion of wet processes, gentle internal heating, good ventilation and the use of de humidifiers will greatly reduce the problem.
- Remove plaster and other building materials contamination as soon as possible with a solution of detergent and rinse with clean water.
- Ensure that any on site assembly or modifications are fully pro- tected, particularly cill joints, glazing beads and glazing systems. Unprotected end grain exposed by site modifications must be properly sealed and protected with a generous brush coat of Teknoseal 4000.

Further Information

Information sheets covering:

- Drying parameters
- Moisture content and machining tolerances
- Site care and storage

are available from the Teknos Service Centres listed below

Teknos UK and Ireland

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