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National Wood Flooring Association of Australia

TECHNICAL BULLETIN #4

WINTER BLUES

Impact of coating timber floors in cold weather.

In winter months when the air temperature drops below 15 degC this will have a negative effect on the coatings application and performance. When air temperature drops even further, below 10 degC, this will have an even more severe negative effect on both the coatings application and performance. One must also bear in mind that the physical floor temperature in a house will be much lower than the air temperature. In addition dampness and humidity will also slow down the drying and curing of the floor coating.
The problems that occur in winter for Solvent based, Water based and Oil-modified finishes are:

Viscosity increases - This means that the coating becomes thicker

This is will result in: Poor flow and levelling, the coat will not want to level out causing

- Orange peel
- Application marks from roller on side and stop marks
- Quilting
- Increased risk of rejection

Increased Surface Tension - This means the coating loses its ability to flow over another surface.

This will result in: Poor flow and levelling

- Orange peel
- Build up at board edges
- Pitting
- Application marks from roller on side and stop marks
- Quilting
- Increased risk of Rejection

Cure Rate slows - This means that coating is not cured throughout the film.

This will result in: Coating being "green" for longer.

- Full cure can take weeks and made worse when additional coats are applied over an uncured coat.
- Slower solvent release requiring extended dry and curing time
- Delamination of subsequent coats especially water base finishes
- Swirl marks/cob web from screen backs when screening back
- Clogging up of abrasives
- Finish coat will scratch and scuff VERY easily
- Contrary to common belief water based finishes are equally as sensitive to the above problems as solvent finishes.
- The Dry/Cure rate will be MUCH slower on water based finishes

Slow solvent release - This means the coat will stay wet for longer time.

This will result in: Longer open coat time.

- Extended dry and significant curing time required
- More time required for solvents to evaporate
- Premature re-coating will result in delamination
- Longer open coat allows dust to settle in coating
- Greater chance of rejection with oily timbers such as Spotted gum and extractives from Brush Box causing problems.
- Hazy surface appearance
- More chance of "Ghosting".
- Inconsistent gloss levels especially with polyurethane coatings

Coating below dew point - This is when the temperature drops below dew point. Say in afternoon when evening temperature starts to drop.

This will result in: Water base finishes not drying and inconsistency in solvent finishes gloss levels.

- Water base finishes not drying and hence not curing
- Water base finishes drying in a " white" crystalized fashion
- Cracking of the film
- Gloss solvent finishes dry inconsistently and dull
- Satin solvent finishes dry inconsistently and shiny.

In Winter time to minimise the above problems one needs to attend to factors that will influence the dry and curing times:

1) The major factor that will contribute to drying and curing of the coating is VIGOROUS air movement and circulation over the drying surface. This will remove the solvent and water evaporation air layer above the coating. Enclosed rooms or windows cracked open will not increase the air circulation. One needs to have large fans to circulate fresh air as "dead air" stops the coating from drying and curing.

2) By increasing the air temperature before coating (warm up the room) will reduce coating application problems and keeping the area warm after coating, will minimise the drying and curing problems.

3) Always store the coating can at normal room temperature during winter. Before use do not store in the van or on a concrete floor overnight. Acclimatise the coating before using it.

4) As coatings dry from the top down. The solvents need to escape through the top and as the film coat dries these solvents will takes longer to escape. Each time a new coat is applied over a previous coat that is not fully dried and cured, the trapped solvents will take longer to escape. That means the curing of the coating will be slower, the coating will stay soft longer, resulting in more surface scratches and marring of the top coat.

5) Always take note of the environment that one is working in as this will dictate how the coating will behave.