

Remmers Information Sheet

Solar heat gain on wood coatings

When using pigmented finishes on coated timber there is a risk of certain problems caused by the tendency for solar heat gain. The darker the finish, the worse this heat gain can become. Temperature varies considerably on an opaque coated surface in direct sunlight when the air temperature is 20 °C. In the blue to black region, the surface temperature can rise to 85 °C. In the yellow end of this spectrum the effect is less severe but it can still reach 50 °C. Apart from white or very light colours which tend to stay at the ambient temperature there is a risk of this solar heat gain effect. For a timber such as Scots Pine (European Redwood), resin pockets can be mobilised at temperatures as low as 40 °C and there is an extremely high risk of resin bleed at 70-85 °C.

Other resin rich softwoods such as Larch and Douglas fir will also be prone to this risk of resin exudation. This risk is not confined to softwoods however, as hardwoods such as Meranti and Sapele contain similar substances often referred to as gum which will exude out of the timber at high temperatures. While it is less frequent in these species it can still occur. Resin or gum exudation will often permeate through the coating slowly at moderate temperatures but at a higher temperature the speed of this exudation can disrupt the coating surface and cause detachment. The other problem with dark finishes is that solar heat gain can result in the moisture content being lowered far more than with normal dry weather, depending on the level of sunlight. Once it rains the moisture content will start to rise and this will cause more movement than would normally be expected. This rapid change in moisture content can cause potential defects in the timber in the form of cracks, splits and twisting which can then lead to peeling of the coating layer near to the defect. Coatings can help minimise these rapid changes but with the darker shades the coating may not be able to prevent problems.

Solutions

- **Avoid dark finishes on timber substrates wherever possible.**
- **When using dark finishes avoid resin rich timbers such as Pine, Larch and Douglas Fir.**
- **If black or very dark colours are essential aim to use stable timbers with a low gum or resin content. Accoya is particularly suitable in this regard.**

For further advice contact the Remmers Woodcoating Technical Team.

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