



Resene Paints Limited

Architects Memo

NO 29 JUNE 1983

ALKYD V. ACRYLIC II

Interest shown in our last memo and the comments it raised has prompted us to return to the subject and discuss a topic which obviously is of great interest. It concerns the overcoating of old alkyd systems with acrylics.

Memo No. 28 finished with the conclusion that if a substrate was sound and the weather favourable, an acrylic will generally give better performance. This raises the question of when is a surface sound? Let us consider a house, built of heart rimu, 50 years old. It has been maintained conscientiously over the years in white oil-based or alkyd paint, and has never appeared to need a burn-off. The surface is now lightly chalking and needs a repaint. It appears as sound as a bell! The owners decide they are tired of white and wish to paint it a fashionable dark olive green.

The points to consider are as follows:—

1. The original primer is now 50 years old. The natural embrittlement has been progressing and the primer will have little flexibility or cohesive strength left.
2. Acrylics form very tough, adherent flexible skins.
3. Acrylics are very oil resistant and do not readily allow oils to pass through them.
4. The surface temperature of a white coating will not be but a few degrees higher than the air temperature; dark coloured coatings however can have surface temperatures 50-60°C above air temperature when in direct sunlight. Acrylic coatings are quite happy at these elevated temperatures but with alkyds the degeneration and embrittlement is greatly accelerated.

Consider now the effects of these points on our example. The old embrittled system (which does still have the strength to hang on) is suddenly jolted out of its normal temperature cycle range of 0-25°C and subjected to 0-80°C. This in itself is sufficient to cause the original primer to let go but the new higher temperatures can also cause the mobilisation of oils and resins present in the timber which had previously been stable at lower temperature levels. These resins migrate to the timber surface and the more volatile oils try to force their way through the film. Great pressure is needed to try and get through the years of build-up and even if the oils succeed in getting through, they then come up against the strong, oil-resistant acrylic barrier.

Breakdown of the system ensues, but because the acrylic is so tough and adhesive it does not allow the system to fail in small flakes and blisters but rather holds it together into very large spectacular blisters.

It has been confirmed that had the house been painted with an alkyd of similar colour, breakdown would still have occurred at about the same time but not in such a spectacular manner as the acrylic.

The example taken above is an extreme example but it must be remembered that any colour, or type, of paint applied to an old system is going to put some extra stress on that system. Eventually there is going to be one coat, be it alkyd or acrylic, that will break the camel's back. At that stage, only total removal of the old paint system will suffice as surface preparation.

GOUGH STREET, LOWER HUTT.
NEW ZEALAND. P.O. BOX 36-006.
TELEPHONE (04) 684-319.
TELEGRAMS "RESENE".
TELEX: WELLINGTON NZ 3353
SEEK (RPL).
FAX: (04) 686-987.
BRANCHES: WHANGAREI,
AUCKLAND, HAMILTON,
TAURANGA, ROTORUA, NAPIER,
HASTINGS, NEW PLYMOUTH,
PALMERSTON NORTH, LEVIN,
PARAPARAUMU, NELSON,
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