



Resene Paints Limited

# Architects Memo

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## FIRE AND THE PAINT INDUSTRY

When Prometheus defied the gods and brought the gift of fire to earth he presented us with a two-edged sword. This very convenient source of energy and warmth is also a common force of destruction which costs this country alone millions of dollars a year, and several lives. These are two very powerful reasons to try and reduce the flammability of materials in general use.

A flammable material (which means exactly the same as an inflammable material) is one which, at a certain temperature, can enter into a rapid, self-sustainable reaction with oxygen.

The basic split between flammable and non-flammable materials separates the organic materials from the inorganic (minerals), with metals occupying a separate middle ground. The organic materials include wood and its derivatives, most fibres, plastics and polymers. Paints contain a mixture of both minerals and polymers and, as a consequence, can vary in flammability across different types.

In order to quantify flammability two types of parameters are tested; fire rating and early fire hazard. It must be made clear that a fire rating can not be given to an individual component, but to a complete (or partial) structure. That is, a fire rating can not be given for gypsum plaster per se, but can be given for a 6" block wall coated with a specified thickness of gypsum plaster render.

Early Fire Hazard testing can be done on individual components such as paint but as paint is always used over a substrate, each substrate/paint system must be evaluated. Early Fire Hazard testing in New Zealand is done to the Australian Standard AS 1530, 34976 which provides information (or indexes) on ignitability, spread of flame, heat evolved, and smoke developed.

This differs sharply from the older New Zealand Standard NZSS 644 which only

measured spread of flame. It is worth noting that the two standards work from entirely different concepts: NZSS 644 attempts to simulate the passage of fire along a corridor and had a steep temperature gradient along a long sample, AS 1530 simulates passage of fire across a wall using a larger specimen at uniform surface temperatures. Consequently there is no real correlation between the two standards.

Although there are many types of paint, they can be banded into three categories with regard to fire:

- 1 Standard paints
- 2 Non-burning paints
- 3 Intumescent paints

Standard paints, applied at normal thicknesses contribute very little to fire properties of substrates. Although a highly filled matt paint may contribute less than a resinous glossy paint the effect is minimal compared to the effect of the substrate. Using standard paints the indexes for the painted system are almost identical to the indexes for the uncoated material.

Non-burning paints, as their name indicates, are designed such that free films of these paints will not support combustion. They are useful as thick coatings over non-flammable substrates where the amount of coating applied could contribute to a fire risk if the coating was inflammable. These paints have very little insulating or protective effect and are generally not effective at up-grading inflammable substrates.

Intumescent paints are designed to react with heat to melt, foam, and then char so forming a thick protective insulating layer. This is the major category of paint used to significantly upgrade the performance of flammable substrates in the fire situation.

In next month's memo the role of specific Resene products in this area will be discussed.

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