PROMETHEUS DEVELOPMENTS LTD.

Unit 9 Langley Park
North Street
Langley Mill
Nottingham
NG16 4BS

Tel: +44 (0)1773 764206
Fax: +44 (0)1773 765048
E-Mail
david.aslin@prometheusdevelopments.com

Formulation PD 60

Off site Thin Film Intumescent Structural Steel Formulation based on IIT polymer

The formulation has now advanced and the early problems have largely been overcome. The IIT polymer has the advantage that it will shortly be commercially available and large samples are available on request.

This is a two part product relying on the acidity of the orthophosphate esters to form further esters with amino resins with the production of water. The fume extraction requirements are minor, particularly when compared to the requirements of the conventional solvent based, fast drying products. The formulation is currently solvent free. The only hazard is a minor emission of formaldehyde during curing.

The IIT materials produce their insulation char at far lower temperatures than conventional APP based products. The DFT efficiency of this formulation is equivalent to or better than the best in class water based conventional APP formulations. Fire test results from a third party furnace are available on request. The remaining work is to adjust the char such that the degradation rate is equivalent to APP formulation, so that the advantage of the lower activation temperature is carried through to the arbitrary failure temperatures.

While not a major legislatory concern, smoke emission on activation is negotiable.

Part A consists of blended amino resins, pigments and plasticisers. Solvents may be incorporated but are not necessary if the correct application equipment is selected, but may assist in extending shelf life.

Part B consists of the 80% solution of IIT polymer and pre-reacted phosphoric acid (PRPA).

Cure Time and pot life depend on adjusting the ratio of melamine formaldehyde to urea formaldehyde resins and the blend of IIT polymer and PRPA.

Application is with conventional airless spray. However a two-headed gun would be more appropriate for continuous production. Plants may be cleaned in diluted Part B.

The green cure time may be adjusted between 3 to 30 minutes, giving an equivalent pot life of 10 to 90 minutes. Hard cure is about 4 times the green cure time with ultimate hardness being achieved within 24 hours.

Part B is acidic but the acidity is orthophosphate, which passivates mild steel. The product may therefore be labelled as non-corrosive. A mild steel plant is acceptable.

The finish is sateen and the film is exceptionally hard and able to resist significant impact and abrasion. Technology is available to further enhance the toughness if required.

The product will resist moisture and lying water for considerable periods. While lying water may degrade the appearance and soften the film, leaching cannot occur.

Primers must not contain red oxide or talc. Virtually any top coat is acceptable but pure acrylics and silicone alkyds should be avoided. It is anticipated that two pack aliphatic PU will give extended external exposure.