

FACT SHEET

WATER-BASED PAINT

Water-based (or acrylic) paints have been used commercially for decades worldwide and their superior performance for long term decoration and protection is well proven. Yet many people still do not understand the difference between water-based (acrylic) paint and solvent-based (alkyd) paint, says the APMF.

Water-based paints are formulated with resins which have a different chemical composition than those used in conventional (solvent-based) paint. The acrylic chemistry is very similar to that used in acrylic plastic sheet and moulding powder, with well known applications, including outdoor illuminated signs, street light covers and rear-light covers.

Acrylic resins for decorative paints are designed to maximise resistance to weathering without being too hard or rigid for use as house paints.

Other than differing in chemical structure from alkyd resins, acrylic resins also dry by different mechanisms. The acrylic emulsion contains tiny spheres of polymers held in suspension in water.

When a thin film is applied to the surface, the water evaporates and the spheres are forced together by capillary pressure. With coalescents present to soften the surface, the spheres fuse together to form a continuous film of polymer. This is then insoluble in water after the water and coalescents have evaporated from the film.

Water-based paints are water thinned. These paints are often selected because clean-up can be done with soapy water. These paints

are also durable, easy to apply and retain colour well with time. These paints also emit low amounts of Volatile Organic Compounds (VOCs), which is good for the environment.

By and large, normal water-based paints find applications in protection and enhancement of the aesthetics of concrete and brick surfaces.

The key cause of failure of paint applied to this kind of surface is the presence of excessive moisture with the material coated. Concrete is porous, which means it can absorb or lose water depending on moisture content and temperature of the environment.

When water is present in excessive amounts, the adhesion of the paint is reduced. Simultaneously, vapour pressure will be exerted on the coating from the excessive moisture seeking to escape, leading to blistering of the paint, particularly as its adhesion has already been reduced by the water present.

Water-based paints, to some degree, allow excessive moisture to escape in the form of water vapour.

New concrete, with a high alkaline content, is another source of failure. Water-based paints are alkali resistant and may be applied directly to all alkali surfaces such as fresh masonry, stucco and plaster.

The consequence of this is that water-based paints last longer, look better and save money in the long term.