Resene

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LATEX WHAT?

One of the often asked questions of a paint manufacturer is "What is the difference between a latex and acrylic paint?" This superficially innocuous question in fact highlights both the rather woolly nomenclature used in the painting industry and the danger that arises from using a general term such as latex, to describe a wide range of very specific products

The confusion that exists in the minds of people outside the industry is perfectly understandable The world's leading manufacturer of acrylic paint vehicles introduce their range of products thus —The (brand) **emulsions** are a group of **acrylic latex polymers** . . . There is nothing wrong with this description but the four underlined words are each individually used to describe the same thing

LATEX Latex is a latin word meaning a fluid juice Botanically it is used to describe saps of plants particularly milky-white exudations Latex was, therefore, the word used to describe the sap from rubber trees and rubber latex is commonly known. When synthetic rubber was manufactured from styrene-butadiene in a water suspension, this was referred to as synthetic latex Styrene-butadiene latexes were then modified for use as paint vehicles and these were naturally referred to as latex paints Subsequent paint vehicles, which like their predecessor, consisted of a solid film-former dispersed in a water phase have also been referred to under the same umbrella name of latex.

These include acrylics, P.V.A's, styrene-acrylics, versatate and maleate copolymers.

EMULSION An emulsion classically refers to an intimate mixture of two mutually insoluble liquids: one of the liquids existing as fine droplets within a continuous phase of the other. The emulsions of main interest to the paint industry are those which have a continuous phase of water and these are what we will consider. From the definition it can be seen that the dispersed phase (droplets) is insoluble in the water (continuous phase). Additions of further water will thin down an emulsion by separating the droplets; hence the reference to emulsion/latex paints being water-thinable rather than water-soluble This also explains why, after the water has evaporated, a water insoluble film is deposited

As stated above emulsions generally refer to liquids mixed in liquids — where a solid particle (such as a pigment) is mixed in a liquid it is referred to as a dispersion These borders are crossed however If molten wax is emulsified with water, it is referred to as an emulsion even though the droplet of wax hardens to a solid When manufacturing an acrylic the liquid raw materials are first emulsified with water These liquid droplets are chemically converted into solids but are still referred to as an emulsion Emulsions used in the paint industry can be based on oils, alkyds, or any materials described under the 'latex' umbrella

POLYMER (Homo & co-polymer) A monomer is a simple chemical unit which has the ability to link up with other monomers to eventually form polymers — the prefix poly simply meaning many. Where only one monomer is involved the polymer produced is referred to as a homopolymer. Simple examples are ethylene polymerising to polyethylene, and styrene polymerising to polystyrene.

Polystyrene is a rather hard, brittle material of little use by itself as a paint vehicle On the other hand polybutadiene is far too soft for use by itself A blend of the two materials however, can be co-polymerised to give a polymer with suitable balance properties This is referred to as a copolymer Third and fourth monomers can be introduced into the polymer molecule in order to build in other special properties

ACRYLIC The term acrylic refers to polymers based on acrylic and methacrylic acid and esters derived from them There are about 18 different acrylic monomers The term 100% acrylic refers to polymers whose monomers are exclusive to this group (this then excludes vinyl acrylic co-polymers, and styrene acrylic co-polymers)

To generalize on the properties of acrylics as a group is virtually impossible They range from hard glass-like to soft rubbery materials They include solvent borne laquers, casting resins, baking finishes, as well as the latex-type polymers Even within the latex-type, generalization is impossible. If one considered the eighteen acrylic monomers as colours which could be blended in any numbers and in any ratios, the range of colour shades obtainable is infinite — so it is with acrylic polymers

Latex-type acrylics can be formulated for coatings that 'chalk' very rapidly for the American self-cleaning type of paint, or for coatings that delay the onset of chalking for many years to suit the N.Z. consumer demands They can be formulated for coatings which have very high adhesion, or for strippable coating Acrylics can have excellent alkali-resistance or be designed to be totally removed by mild alkalis

How does one answer the initial question then, obviously one can't Specific paint systems can be compared over a specific surface over a wide range of properties Even without exposure data the paint chemist can reasonably compare two paint systems if he is given all the necessary data on the paint and polymer composition No-one however, can answer the general question at the beginning of this article

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