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SOLVENT-BASED COATINGS TECHNOLOGY

In paints, solvents dissolve or disperse the components used in the paint formulation, to make paint the desired consistency for application and to avoid clumps or globs. Glycol ether esters are added to some spray paints to prevent them from drying in mid-air. The slow evaporation of this powerful group of solvents means that the coated product can get several smooth, flawless applications of paint for a beautiful, more durable finish.

Given that the majority of polymer-based coatings are prepared and applied in liquid form, solvents are critical raw materials in coatings manufacturing. Organic solvents are used to dissolve the polymers and oligomers that will eventually form the cured coating in solvent-based coatings. Furthermore, a large proportion of the polymers used in coatings must be synthesized using organic solvents. The solubility of the polymer in the solvent is critical for the proper manufacture and application of the coating in these systems, and both the solvent strength and the polymer solubility are critical parameters. The boiling point, relative evaporation rate, reactivity, and toxicity of organic solvents are also critical properties. Hexane and other aliphatic compounds (compounds with chainlike molecules); toluene, xylene, and other aromatic compounds (compounds with ring-shaped molecules); mineral spirits; methyl ethyl ketone; n-butyl acetate; t-butyl alcohol; and ethylene glycol are all examples of commonly used organic solvents. Solvency and evaporation control are frequently achieved through solvent mixtures.

Since the 1960s, the use of organic solvents in polymer-based coatings has been restricted to an ever-increasing extent due to concerns about air pollution. These substances with a low molecular weight, collectively referred to as volatile organic compounds (VOCs), are released into the atmosphere during the application and curing of the coating. As a result, cities with severe air pollution problems, such as Los Angeles, have extremely strict regulations regarding the use of solvents in coatings. Volatile organic compounds now account for less than 20% of the product's volume. Due to the relatively small amount of solvent contained in CPC's newer coating systems, which are based on organic solvents but comply with pollution-control regulations, they are referred to as high-solids coatings.

ADDITIONAL INFORMATION ABOUT SOLVENT-BASED COATINGS

Polyurethane surface coatings are a major industrial polymer.

Polyurethanes are among the most advanced coating materials available. The product is available in a number of different formulations. A single type is one that is composed of a single component.

Water is used as a solvent for latex coatings and as a carrier liquid for so-called water-reducible coatings. While water does not pose a pollution hazard on its own, it is frequently combined with organic cosolvents to ensure the proper solubility of coating polymers, and these cosolvents can become VOC contaminants.