Unsaturated Polyester Resin

Subjects: Polymer Science

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An unsaturated polyester resin is a thermoset precursor in which unsaturated diacids are condensed with a diol and the resulting oligomer is dissolved in a reactive monomer. The double bonds in the backbone and in the monomer copolymerise during curing, so the monomer acts both as a diluent and as a crosslinker [1]. Styrene is the usual monomer, and its fraction controls the viscosity before cure and the crosslink density after it [2]. The cure is initiated by a peroxide and accelerated by a metal soap, and the two have to be matched to the temperature at which the part is processed [3]. Shrinkage during cure is appreciable and causes sink marks unless a low-profile additive is included [4]. The resin absorbs water through the ester linkages, and the hydrolysis of those linkages is what limits the long-term service in a wet environment [5].

thermoset | unsaturated diacid | styrene monomer | crosslinking | peroxide initiator | cure shrinkage | ester hydrolysis

References

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