



Technical Service Memorandum 306

Adhesive and Solvent Bonding of K-Resin® SB Copolymers

INTRODUCTION. Many applications require joining of parts molded from K-Resin styrene-butadiene copolymers or other materials to K-Resin copolymers. Molded parts of KR01 and KR03 grades can be bonded to themselves and to each other, as well as to parts of other materials by adhesive and solvent bonding. Conventional adhesive systems can be used as well as solvent bonding.

TYPES OF BONDING. Adhesives: When bonding dissimilar materials, some conventional adhesives may be used with KR01 copolymer, i.e., contact adhesives, urethane adhesives, pressure sensitive adhesives, epoxies and rubber base cements. With KR03 copolymer, the same surface pretreatment is recommended as for decorating (Technical Service Memorandum #305). After surface treatment, the adhesives listed above may also be effective with KR03. It is usually necessary to try a number of adhesives for each application in order to find the one most suitable.

Below is a listing of adhesive suppliers whose products can be used with K-Resin copolymers.

LOCTITE CORP.
705 North Mountain Rd.
Newington, CT 06111
203/278-1280

3-M CORPORATION
3-M Center
St. Paul, MN 55101
612/733-1110

Dymax Corporation
51 Greenwood Road
Torrington, CT 06790
860/482-1010

Solvents: Solvent bonding is a convenient method of joining K-Resin copolymers to themselves or to other materials. K-Resin copolymer part surfaces are sufficiently soluble in a number of hydrocarbons and other chemicals to enable the formation of solvent bonds. If the material to be bonded to a K-Resin copolymer is similarly affected by the solvent, this may be a desirable method of joining. Toluene, 1,2-dichloroethylene, ethyl acetate and methylene chloride all produce good bond strengths. Toluene consistently produces a strong but slower bond. Studies indicate that 1,1-dichloroethane and chlorobenzene (or monochlorobenzene, MCB) may be useful as solvents for bonding K-Resin copolymers. The 1,1-dichloroethane exhibits a toxicity level by volume (TLV) of 200 ppm and MCB of 75 ppm. Both solvents or a combination of the two may be used in much the same manner as previously recognized solvents including methylene chloride (TLV = 100).

When bonding K-Resin copolymers to ABS, dimethyl formamide has proved most effective. A particularly difficult application has been in medical device applications where it is desirable to join plasticized PVC to K-Resin copolymers. The plasticizers in PVC have precluded formation of good, long term solvent bond.



A more viscous solvent cement can be obtained by dissolving K-Resin NW copolymers in the base solvent. A solvent/resin ratio of 3:1 has proven to be a satisfactory starting point, though the viscosity of the solution may be adjusted by changing the ratio.

In applications subject to FDA acceptability, the residual solvent level should be zero as the part exits the drying tunnel. If residual solvent is dissolved in the part and remains there, FDA status must be given consideration.

SUMMARY. Parts molded from K-Resin copolymers can be joined to themselves and to parts molded from other materials by adhesives and solvents. It requires a trial of adhesives or solvents in each application to find the one most suitable. It is the potential user's responsibility to determine the precautions for safe and proper use of these solvents and solutions in that manufacturing situation. Furthermore, they should consider studying the long term effects, if any, of the materials on the performance and appearance of K-Resin SB copolymers.

