

New Mixing Method For Hot Melt Adhesives

The adhesive backing commonly used on tape, labels, etc. must possess several properties: it must be sticky, it must be elastic, not brittle, and it must be insoluble in water. The general formulation of elastic polymers and stabilizers dissolved into water insoluble adhesive resin exhibits the required properties. Solvation of polymers and stabilizers into the resins is accomplished by agitating the mix under heat (350°-400°F).

For years the adhesive industry has made these solutions in a kettle mixer. Many problems are encountered with a kettle mixer: inability to handle high viscosities, poor mixing action and inefficient heat transfer. All these problems necessitate long mix cycles.

The Littleford intermediate intensity mixer which has long been renown for its superb heat transfer characteristics, is now proving to be especially well suited for making hot melted adhesive solutions. Lab tests indicate cycle times of 30 to 60 minutes, including melting of resin in the mixer and deaeration of the batch. Faster cycle times are achievable if the resin is premelted prior to introduction to the mixer.

Once the resin is melted, the stabilizers and elastic polymers (crumb form) are added and solvated.

Near the end of the solvation cycle, the mix is dynamically deaerated by vacuum. The hot bubble-free solution is then discharged through a contoured ball valve in the bottom of the mixer. This contouring of the discharge ensures that no "dead space" exists that can trap unmixed materials.

A typical hot melt batch tested in Littleford's lab might have the following parameters: a bulk density of 50#/ft.³, a batch size of 150 lbs., a horsepower requirement of 0.033 hp/# and a viscosity of 8,000-10,000 cps at 350°F. Littleford appreciates the need to control certain parameters and can offer the flexibility to do so. For example, certain elastic polymers shear degrade during the solvation step. This can lead to undesired lower viscosity in the final solution. Littleford can solve this problem by offering variable speed which can lower shear during solvation while still giving economical cycle times.

Littleford's design has been tested in the lab and proven in the field. The mixer lends itself easily to automation. It is readily cleaned just by using the proper solvent; the whirling action of the plows cleans the mixer. Proper design, such as outboard bearings mounted away from the heat and solvents, coupled with rugged construction ensure years of trouble-free production.