Littleford Technifax

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BULK
MOLDING COMPOUND

One Mixer Is Better Than Two In BMC Blending

Glass reinforced polyesters (Bulk Molding Compounds) belong to a family of plastic materials known as thermosets, plastics that once cured or set into permanent shape cannot be melted and reformed. BMC's are made up of viscous polyester resin, fillers, pigments, catalyst, modifiers, followed by chopped strand fiberglass added in varying amounts to modify the physical properties of end products.

Polyester resin compounds are specified in many plastic design applications because of their high versatility and relatively low cost. Polyester resins in general have been shown to exhibit good electrical, mechanical, and chemical properties; specific resin formulations, such as BMC, provide flame resistance, flexibility, weather resistance, and high strength coupled with relatively low weight. BMC can be either compression molded or injection molded into such items as auto parts, power tool cases, electrical junction boxes, cafeteria trays, etc.

Critical to final molded product performance is the thoroughness with which the ingredients have been mixed and dispersed. Due to the diverse nature of the ingredients (dry powders, viscous liquids, bundled fibers, etc.), proper mixing had until now required 2 separate mixing processes. First, a uniform dispersion of polyester resin, filler, catalyst, pigment, and modifier was prepared. The resultant dispersion was a paste of low to high viscosity depending on the formula. Second, the glass reinforcement was added to the paste dispersion and mixed so that all glass fiber bundles were opened and each glass strand coated with premix paste. Extreme care had to be used to ensure that the glass did not break into filaments, thus affecting the end product's physical properties.

The two step mixing process typically used in the past for BMC preparation involved a high speed liquid mixer to prepare the paste, and a low speed, high shear Sigma-type mixer to combine the paste and glass reinforcement. Many problems are inherent with these two processes:

1.) Multiple pieces of equipment are required.
2.) Long mix times (30 min. plus) are typical.
3.) Extra material handling between separate mixers is required.
4.) Hand removal of the final product from the Sigma-type mixer is very difficult.
5.) Loss of styrene vapor occurs in open system.
6.) Filamentation of the glass strands is likely.
7.) Poor dispersion can cause inferior final product.

Littleford process technology and mixer design combine to provide a totally new concept in preparation of glass reinforced polyester. The unexcelled efficiency of the Littleford mixer is developed by the size, number, arrangement, geometrical shape, and peripheral speed of plow-shaped mixing elements which rotate within a horizontal mixing cylinder and force the product into rigorous three-dimensional motion. This intense mix action permits preparation of the premix dispersion paste followed by the complete coating of all glass fibers — in one mixer.

The versatile Littleford intermediate intensity mixer offers many other benefits:

1.) Short cycle times normally between 5-10 min.
2.) The dynamic action of mixer requires only seconds to discharge the finished product through a large, contoured bottom door.
3.) The final product is completely dispersed, with all glass fibers evenly coated. Molded Littleford process parts exhibit properties generally superior to those of conventional methods. Littleford processed material is fluffier (less dense) and thus more easily handled than conventional process material.
4.) Glass fiber strands of ⅛", ¼", and ½", at loadings of from 5 to 50% of the total batch, can be easily and completely coated without filamentation of the strands.
5.) The Littleford mixer lends itself to automation, this allowing labor savings even above those gained from the reduced material handling requirements for the single vessel.
6.) The closed Littleford system permits only minimal loss of styrene vapor.
7.) The Littleford mixer is easily cleaned: add the proper solvent (and possibly a rubbing agent) and the whirling plows sweep the mixer clean.
8.) SMC paste can also be efficiently prepared in the same mixer. SMC paste is easily discharged through a contoured ball valve mounted in the large discharge door. Vacuum modification can even permit dynamic vacuum deaeration of the SMC paste.

Coupled with Littleford's advanced technology is a rugged mixer construction which stands up under harsh conditions. Littleford mixers are available in a wide range of capacities to meet your requirements. Let Littleford's advanced technology cut your BMC costs.