

SPOTLIGHT: MIXING & SIZE REDUCTION

In-line powder disperser cuts blending time 75%

Polymeric thickener is dispersed into 1000-kg batches of gel

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Problem: Medicia Pharmaceutical Corp., Belle Meade, NJ, was encountering difficulty incorporating a low-bulk-density polymeric thickener into a gel for a micro-encapsulated product. By the time the powder was roughly stirred into the batch, large lumps that were difficult to eliminate had formed. Prolonged high-shear mixing caused significant shear

damage, variations in viscosity and reduced product quality.

A batch of gel is manufactured in a 1000-gal mixing vessel equipped with a scraped-surface agitator and a high-shear, homogenizing mixer. The high-shear mixer was located well above the bottom of the vessel in order to prevent contact with the anchor agitator. Only a portion of the final batch volume was present during the stabilizer preparation phase of the product. It was difficult to maintain the minimal fill level required to cover the high-shear mixer when the polymeric thickeners were added.

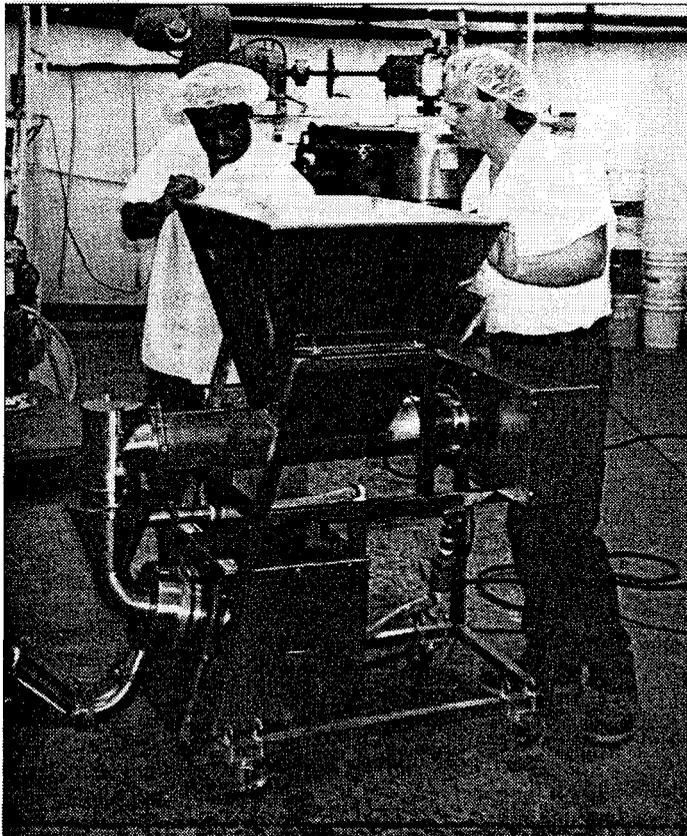
Solution: Medicia Pharmaceutical Corp. installed an in-line powder disperser on the floor level directly adjacent to the mixing tank. A check valve was positioned downstream of the disperser to prevent backflow from the tank. The polymeric thickener was added to the 170-liter disperser feed hopper in 22-kg (a full container) increments.

The hopper/feeder contains a variable-speed volumetric screw conveyor. The solids feeding rate is adjusted by a dial-operated, variable-speed control according to the desired concentration. To make a 1000-kg, 2% batch, the liquid flow rate was set to 75 liters/min and the powder feeding rate to 1.75 kg/min. The disperser can produce concentrations of up to 5% solids of this difficult polymeric thickener.

Results: The mixer/disperser has eliminated the lumping problem. It has also increased dispersion speed and enhanced product quality. A typical 2% batch of polymeric thickener is completely dispersed in less than 12 minutes. This is a major time saving versus alternative methods.

One key operating feature of the in-line disperser is the capability to independently control the flow of liquid and the feeding rate of solids. This allows for the complete dispersion of all of the solids in one pass through the machine. Solids can be dispersed directly into a clear, low-viscosity liquid. Liquid with earlier dispersed powder is not subjected to repeated shear. □

Model D-6000 Dilumelt mixer/disperser was supplied by Arde Barinco, Inc., Norwood, NJ. **Circle 402**



Operators examine the hopper-feeder prior to cleanup. When a hopper used for polymeric thickener is cleaned, thorough dry cleaning is recommended before adding water.