RECOMMENDED MIXING EQUIPMENT FOR

Food Emulsions

Ross High Shear Mixers and Multi-Shaft Mixers

Food manufacturers rely on a range of high speed mixers to accomplish various processing objectives including emulsification. High Shear Mixers, for instance, are widely used throughout the industry for preparing emulsions under 10,000 centipoise (cP). The basic single-stage design features a four-blade rotor that turns at tip speeds around 3,000-4,000 ft/min within a close tolerance fixed stator. It creates mechanical and hydraulic shear by continuously drawing product components into the rotor and expelling them radially through the openings in the stator. This turbulence generates small droplets of the dispersed phase and distributes them throughout the continuous phase. High Shear Mixers are also effective in dispersing solid additives such as thickening and weighting agents (i.e. gums) which serve to stabilize the emulsion. New models are capable of injecting powders sub-surface – a method of solids addition proven to eliminate fish eyes and shorten mix time.

Products that undergo viscosity changes peaking well over 50,000 cP are typically batched in Multi-Shaft Mixers. These machines are equipped with two or more independently-driven agitators working in tandem to deliver a combination of high shear agitation and laminar bulk flow. A Triple-Shaft Mixer featuring a low-speed anchor, a rotor/stator assembly and a saw-tooth disperser blade is particularly ideal for processing thick and sticky emulsions. The wings of the anchor agitator normally include adjustable scrapers for wiping the vessel bottom and sidewalls. This allows for tighter temperature control in addition to enhanced product turnover.
Ross Ultra-High Shear Mixers

More challenging emulsions generally require agitation at greater shear levels to achieve stability. When conventional rotor/stator devices cannot produce the desired droplet size distribution, a next practical step is to utilize an Ultra-High Shear Mixer. Several designs are available including the Ross X-Series, a special inline rotor/stator engineered to run at tip speeds over 11,000 ft/min. It consists of concentric rows of intermeshing teeth; product enters at the center and moves outward through channels in the rotor/stator. The extremely close tolerance between adjacent surfaces of the rotor and stator is adjustable for fine-tuning shear levels and flow rates. X-Series Ultra-High Shear Mixers are proven to replace expensive colloid mills while producing better quality emulsions at higher throughputs. In certain applications, X-Series Mixers can outperform high pressure homogenizers or, when used as a “pre-mixer”, increase equipment utilization by reducing the number of homogenizer passes.

For more information on Ross Mixers
Visit www.foodmixers.com or click here to download a brochure.