APPLICATION SUMMARY:

Different types of mixing equipment are utilized in the various stages of detergent production. One proven design is the Ross Multi-Shaft Mixer which is commonly used as a “crutcher” or final mixer where the surfactants, builders, fillers and additives are all blended together. This versatile mixer provides a unique combination of bulk agitation, high speed dispersion, particle size reduction and superior heat transfer.

Ross Multi-Shaft Mixers

Ross Multi-Shaft Mixers are ideal equipment for the preparation of detergent slurries. Equipped with two or more independently-driven agitators working in tandem, Multi-Shaft Mixers deliver a robust combination of high shear agitation and laminar bulk flow within a wide viscosity range: from water-like consistency to several hundred thousand centipoise.

A typical Multi-Shaft Mixer configuration features a low-speed anchor agitator, a high-speed saw-tooth disperser blade and a rotor/stator assembly. A sample mixing procedure in this detergent crutcher starts with heating of the surfactant blend to the proper temperature. Heating fluid is circulated through the jacketed vessel and the anchor agitator scrapes the sidewalls to optimize heat transfer. As the solid builders (such as phosphates, carbonates and zeolites) and fillers are added, the high shear agitators are turned on. Mixer speeds are fine-tuned to accommodate changes in viscosity, temperature and product turnover. Once a uniform dispersion is achieved, additives like bleach, bleach activators, anti-static agents, fabric softeners, optical brighteners, perfumes, etc. are mixed into the slurry and the batch is cooled.

For granular detergents, the finished mixture is pumped to a spray dryer to produce the final product. The ability to mix relatively viscous slurries with the least amount of water is therefore an important advantage of the Multi-Shaft Mixer. With liquid detergents, vacuum may be applied during mixing to achieve a clear or air-free product.
Advantages of Ross Multi-Shaft Mixers

- **Versatility.** Equipped with independently-controlled drives, the agitators in a Multi-Shaft Mixer can be engaged in any combination and at any speed for any interval during the mixing cycle. The combined mixing and heat transfer capabilities of each agitator results in a very robust system that can handle a wide range of viscosities.

- **Protection against contamination.** The Multi-Shaft Mixer is a closed system with no bearings or agitator seals submerged in the mixing area. Self-adjusting scrapers and flush discharge valves eliminate dead zones where product can stagnate.

- **Cleanability.** With change-can design Multi-Shaft Mixers, the agitators are raised and lowered by a hydraulic lift allowing easy access for cleaning between batches. CIP rotary spray nozzles may also be supplied.

- **Scalability.** Standard and sanitary models from 1 to 3000 gallons working capacity are available in both vacuum and atmospheric designs.

- Customers can rely on Ross for customizations and auxiliary equipment including custom sight/charge ports, interchangeable blades and mix vessels, load cells, temperature probes, heating units, vacuum pumps and controls ranging from simple Variable Frequency Drives and Operator Stations to more sophisticated PLC’s and HMI’s.

Other Applications of Ross Multi-Shaft Mixers

- Battery Slurries
- Beverages
- Creams and Lotions
- Dietary Supplements
- Filled Epoxies
- Flavorings
- Greases and Lubricants
- Gum Dispersions
- Hair Colors
- Hot-Melt Adhesives
- Inks and Coatings
- Liquid Make-Up
- Medical Gels
- Metal Slurries
- Ointments
- Rubber Solutions
- Sealants
- Solder Pastes
- Suspensions
- Syrups and Sauces
- Toothpaste
- Transdermal Patches
- Wax Emulsions

For more information on Ross Multi-Shaft Mixers

Visit www.mixers.com or click here to download a brochure.