



Applications for High Shear Mixers
Dispersion of Hand Sanitizers



Preparation of Hand Sanitizers

Hand sanitizers are any liquid, gel, or foam used to remove bacteria, viruses, and other pathogens from one's hands. Most effective sanitizers consist of an alcohol base, typically ethanol or isopropyl alcohol, along with a gelling agent, such as Carbopol (carbomer) [see coramix.com/learn]. Other ingredients may be added as well, including colors, fragrances, and moisturizing agents.

Mixing Process

Gelling and thickening agents are typically prepared as a solution prior to mixing with the hand sanitizer. It is important that the solution is correctly dispersed and agglomerate-free to achieve desired clarity and viscosity. Where other ingredients are added, proper mixing equipment is required to uniformly disperse the mixture as the quantity of ingredients tends to be small in proportion to the batch.

Mixing Issues

Mixing using traditional agitators involves a variety of issues:

- Carbomer powder tends to float as it is fine and has a low density, which results in dusting issues.
- Carbomer powder agglomerates quickly when hydrated, requiring vigorous mixing. This may take a considerable amount of time, adding to mixing times and generating aeration issues.
- Agglomerates left in the mixture decrease yield, requiring more powder to be added to compensate, increasing material consumption and cost.
- Stratification may occur when mixing the gelling agents and sanitizer base, resulting in longer mixing times, poor consistency, and batch-to-batch variation.
- Agitators take a considerable amount of time to disperse the other ingredients, and may not be capable of reducing the particle size appropriately for uniform dispersion.

Our Solution

Dispersion: Instead of slowly stirring the mixture until it is homogeneous, Coramix mixers use high-shear and mechanical design to disperse the mixture, greatly reducing each batch's cycle time while eliminating any agglomerates.

Phase 1: The Coramix inline mixer is connected with the eductor assembly, as well as pipes from the tank outlet to the mixer inlet and from the mixer outlet to the top of the tank. Base fluid is added to the tank, and the mixer is started to recirculate the fluid.

Phase 2: The powder feed valve is opened, and the solution is added directly into the hopper. The inline mixer pulls in the solution and deagglomerates it as it passes through the high shear mixing zone.

Phase 3: After all of the solution is added, the valve is shut and mixing continues while additional ingredients are added.

Advantages

Coramix high-shear mixers offer a solution to issues associated with traditional agitators:

- Rapid mixing speeds drastically reduce mixing times and mitigate aeration issues.
- Mixing vortex pulls in powders to mitigate dusting issues.
- Agglomerate-free mixture.
- Reduced particle sizes result in a stable emulsion.
- High shear is capable of mixing large viscosity differences, eliminating stratification.
- Functional ingredients at low concentrations are uniformly dispersed, ensuring desired properties are achieved.
- Self-pumping.
- Eliminates operator error and improves batch-to-batch consistency.



Contact: For more information on Coramix products go to Coramix.com, or contact our sales team at Sales@Coramix.com for help in configuring a mixer to fit your needs.