Applications for High Shear Mixers

Dispersion of Filter Aids

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Filter Aids in Brewing

After the fermentation of beer, a suspension of yeast and other solids remains in the batch. This creates a hazy appearance, adds a thicker texture, and decreases shelf life. Many beers, specifically lagers, filter these solids prior to bottling with the use of a filter aid. The most common filter aid is a synthetic amorphous silica replicating a sedimentary mineral commonly referred to as kieselguhr or diatomaceous earth – a natural medium processed as a fine powder. While other filter aids are available, kieselguhr is widely used as the industry standard.

Mixing Process

A kieselguhr filter is prepared in two general steps. First, the powder is dispersed in water to create a slurry. After dispersion, the slurry is pumped into the filter housing to deposit a fine layer of filter medium for the beer to flow through. The concentration of the slurry dictates the amount of leftover solids in the final product and may be changed to achieve desired results.

The process for mixing the slurry using traditional agitators is as follows:

- An agitator is positioned to create a vortex within a vessel charged with water.
- Powder is slowly added to the vortex.
- The powder is mixed until fully dispersed.

Mixing Issues

- The powder tends to form agglomerates, destabilizing the suspension.
- Kieselguhr powder has a very low density, causing the powder to float. Vigorous mixing is required to counter this, generating considerable dust emissions and aeration issues.
- Traditional agitators require long mixing times to fully disperse the powder.

Our Solution

Dispersion: Instead of slowly stirring the mixture until it is homogeneous, Coramix mixers use high-shear and mechanical design to disperse the kieselguhr, 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 kieselguhr powder is added directly into the hopper. The inline mixer pulls in the kieselguhr and deagglomerates the powder as it passes through the high shear mixing zone.

Phase 3: After all of the powder is added, the valve is shut and mixing continues.

Advantages

Coramix high shear mixers offer a variety of advantages over traditional agitators and mixing processes.

- Agglomerate-free mixture.
- High mixing speeds reduce batch cycle times.
- Rapid incorporation of powders.
- Reduced dusting emissions.
- Reduced particle sizes result in a stable suspension.
- Improved efficiency and consistency while cutting operator error.

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.