



Applications for High Shear Mixers
Dispersion of Xanthan Gum



Applications for Xanthan Gum

Xanthan Gum is processed as a free-flowing powder used for its gelling, thickening, and stabilizing effects. A small concentration of Xanthan Gum is capable of producing a large change in viscosity as the temperature rises. It is used in emulsifiers and suspensions, and may be blended with other rheology modifiers, such as Guar Gum, to increase its effects. Some applications where Xanthan is utilized include:

Applications in Food:

- Gluten Substitute
- Sauce/Soup thickener without need for heat
- Emulsions Stabilizer
- Texture Improvement (ice cream, yogurt, etc.)

Applications in Other Industries:

- Preparation for Water Gels
- Emulsions Stabilizer
- Helps evenly spread creams/lotions
- Control rheology of drilling and fracturing fluids in oil industry

Mixing Process

Xanthan Gum may be processed in hot or cold water either individually or along with other ingredients. Manufacturing methods vary based on batch size and desired final product properties, specifically viscosity. The general process for mixing is as follows:

- The gum is slowly mixed into an agitated vessel to avoid formation of agglomerates. Once dispersed, mixing continues to hydrate the gum.
- Other methods to avoid the formation of agglomerates include premixing with other powdered ingredients (such as sugar) to separate particles or dispersing the gum into a non-aqueous phase prior to hydration in the aqueous phase.

Mixing Issues

- Due to the powder's hydrophobic properties, agglomerates tend to form when hydrated. It is difficult for traditional agitators to break down the agglomerates, leading to long mixing times and low yields. Often, more raw Xanthan Gum is added to compensate for this.
- Dispersion becomes difficult as the viscosity of the mixture increases.
- Dispersion aids add additional costs and time to production.
- Traditional agitators aren't capable of dispersing high concentrations of Xanthan.

Our Solution

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

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

Advantages

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

- Agglomerate-free mixture. No dispersion aids or premixing required.
- Capable of dispersing high concentrations of Xanthan Gum.
- Maximized yields through improved dispersion of the gum, cutting raw material costs.
- High mixing speeds reduce batch cycle times.
- Improved efficiency and consistency while cutting operator error.

