



Applications for High Shear Mixers
Dispersion of Guar Gum



Applications for Guar Gum

Guar Gum is processed as a free-flowing powder and is readily soluble in cold water. Used for its gelling, thickening, and stabilizing effects, a small concentration of guar is capable of producing a large change in viscosity as the temperature rises. Guar is used in emulsifiers and suspensions, and may be blended with other rheology modifiers, such as Xanthan gum, to increase their combined effects.

Industries where guar is utilized include:

- Food
- Paper Coatings
- Cosmetics
- Pharmaceuticals
- Mining and Oil Drilling

Mixing Process

Guar Gum may be processed 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:

- For batches prepared with other ingredients, the gum is typically hydrated beforehand to avoid reactions with other ingredients. A negative reaction may drastically reduce hydration rates of the gum.
- To help reduce agglomerates, the gum may be premixed with another powdered ingredient that will not affect hydration rates. This helps with dispersion by separating the particles of powder.
- Another method to reduce agglomerates is to disperse the gum into a non-aqueous phase, such as oils, alcohol, or glycols. The mixture is then added to an aqueous phase to hydrate the gum.
- For isolated and concentrated gum manufacturing, the powder must be vigorously mixed using an agitator to avoid formation of agglomerates. Readily soluble Guar Gum powder must be added rapidly, as viscosity increases as the powder is mixed.

Mixing Issues

- The powder tends to form agglomerates, or fish eyes, when hydrated. It is difficult for traditional agitators to break down the agglomerates, leading to long mixing times and low yields. Often, more raw Guar Gum is added to compensate for this.
- Readily soluble Guar Gum powders thicken quickly upon mixing, making the addition of more powder difficult.
- Traditional agitators struggle to remove agglomerates, requiring high mixing times for complete dispersion/hydration.
- Dispersion aids add additional costs and time to production.

Our Solution

Dispersion: Instead of slowly stirring the mixture until it is homogeneous, Coramix mixers use high-shear and mechanical design to disperse the Guar 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 Guar 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.
- 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.

