



Applications for High Shear Mixers
Dispersion of Artificial Sweeteners



Artificial Sweeteners in Soda

A demand for low-calorie and sugar-free alternatives for sodas and sweets drove the use of artificial sweeteners, such as Aspartame, Acesulfame K, and Saccharin. While more expensive than traditional sweeteners, the alternatives are capable of producing the same sweetening effect at much lower concentrations, compensating for the cost. While replicating taste, artificial sweeteners lack the viscosity and texture of traditional formulas. To compensate, thickening agents may be added.

Mixing Process

Small scale batches may only require a simple blend of liquid sweetener and water. For larger scale batches, a powdered sweetener is dispersed alongside other powdered ingredients using traditional agitators. The batch may be heated to assist in dissolving difficult sweeteners.

Mixing Issues

While powdered sweetener is more difficult to process, liquid sweetener is significantly more expensive. Difficulties that come along with dispersing powdered sweetener using traditional agitators include:

- Even with heating, traditional agitators are slow to disperse, increasing mixing times.
- Heating is energy and time inefficient, and requires additional time to cool.
- Improperly dispersed material by the traditional agitators builds on the walls of the vessel, resulting in increased material and cleaning costs.
- Powder particles tend to be very fine, and will float to the surface, resulting in dusting issues.
- The required vigorous mixing of the agitator further instigates dusting issues.

Our Solution

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

Phase 3: After all of the powder is added along with any additional ingredients, 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 with no heating required.
- High mixing speeds reduce batch cycle times.
- Rapid incorporation of powders, no premixing required.
- Reduced dusting emissions.
- Reduced particle sizes stabilize the suspension.
- Sweeteners are wetted, while other powdered ingredients are hydrated simultaneously.

