



Applications for High Shear Mixers
***Dispersion of Sodium Carboxymethyl
Cellulose (CMC)***



Applications for CMC

Sodium carboxymethyl cellulose (CMC), also referred to as CMC gum, is a water-soluble polymer based on cellulose derived from refined wood pulp or cotton fibers. CMC is used in a wide range of industries as a thickening and stabilizing agent, primarily for its ability to increase viscosity. Some of these industries include:

- Food
- Ophthalmology
- Pharmaceuticals
- Drilling Fluids

Mixing Process

CMC is soluble at any temperature, has many different grades, and comes in powders of varying granule sizes. The process using traditional agitators is as follows:

- The vessel is charged with a base fluid and the agitator is started, forming a vortex.
- The CMC powder is gradually added into the vortex so as to avoid the formation of agglomerates.
- Mixing is continued until dispersion is completed and the powder is hydrated.
- The powder may be premixed with other powdered ingredients prior to mixing to ease dispersion.
- The powder may be dispersed into a non-aqueous phase prior to mixing to delay hydration, avoiding the formation of agglomerates.

Mixing Issues

Dispersion using traditional agitators carries a variety of issues:

- Low-shear agitators struggle to deagglomerate the powder as viscosity increases, especially at higher concentrations, increasing mixing times and decreasing yields.
- Complete hydration and dispersion takes a considerable amount of time.
- Pre-mixing to aid with dispersion adds preparation time and costs.
- Vigorous mixing for long periods of time may lead to aeration problems.
- Incorrect dispersion may lead to postponed hydration of the gum in storage, resulting in undesirable viscosity changes.

Our Solution

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

Phase 3: After all of the CMC 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 reducing dispersion and hydration times, as well as mitigating aeration issues.
- Agglomerate-free mix, including at higher concentrations and larger granule sizes.
- Increased yield, reducing raw material costs.
- Smaller particle sizes result in a stable solution, increasing shelf life.
- Rapid powder incorporation eliminates operator error.
- Increased consistency and repeatability between batches.
- No premixing required, saving on preparation times and costs.



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.