Solutions for Your TOUGHEST MIXING Applications in

FOOD

Production of Flavor Emulsions

SILVERSON

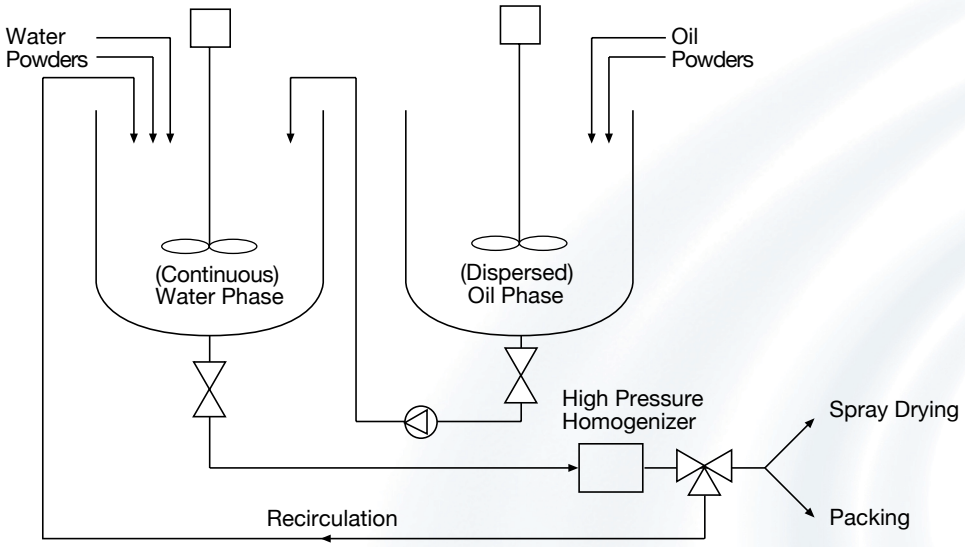
THE FIRST NAME IN HIGH SHEAR MIXERS

Production of Flavor Emulsions

Flavor Emulsions are used in a wide range of foods, carbonated soft drinks and dairy products.

The Process

A typical flavor emulsion contains water, essential oils and emulsifiers and stabilizers such as gum arabic. A typical manufacturing process could be illustrated as follows:



Traditional Method of Manufacture

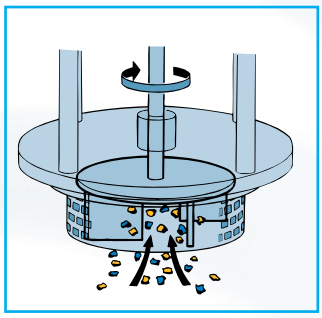
The Problem

Using conventional agitators, some aspects of this process present considerable difficulty to the processor:

- Hydration of gums and thickeners is one of the most difficult mixing operations. In some cases the solution has to be agitated for a long period to ensure the gum is fully hydrated.
- Agglomerates can easily form. These are not easily dispersed using conventional agitators.
- Partially hydrated material can build up on the shaft of the mixer and on the vessel wall.
- A uniform pre-emulsion is required by the high pressure homogenizer. This is not possible using conventional agitators.
- This will result in the product having to be passed several times through the high pressure homogenizer in order to obtain the desired globule size.

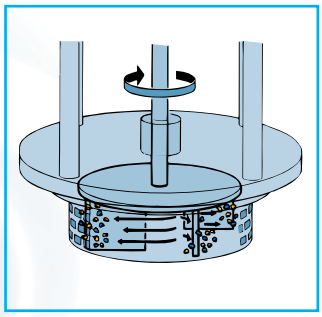
The Solution

Intermediate stages of production can be eliminated, product quality improved and processing times dramatically reduced by using a Silverson mixer. The high shear mixing action of the rotor/stator workhead hydrates and disperses the powdered ingredients and forms the emulsion as follows:



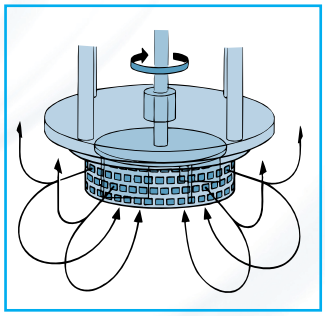
Stage 1

The continuous phase is pumped/metered into the mixing vessel. The mixer is started and the powdered ingredients can be added without premixing. The high speed rotation of the rotor creates a powerful suction which draws liquid and solid ingredients into the workhead, where they are subjected to intense shear.



Stage 2

The powdered ingredients are de-agglomerated in the clearance between the ends of the rotor blades and the stator wall, becoming fully dispersed. The product is forced out through the stator at high velocity and returned to the mix, as fresh ingredients are simultaneously drawn into the workhead.



Stage 3

The combined intake and expulsion of ingredients sets up a circulatory mixing pattern within the vessel. In a short time all the ingredients pass through the workhead and dispersion is completed. The dispersed phase is added to the vessel and an emulsion is rapidly formed. Particle size is progressively reduced, producing a stable and homogeneous mixture.

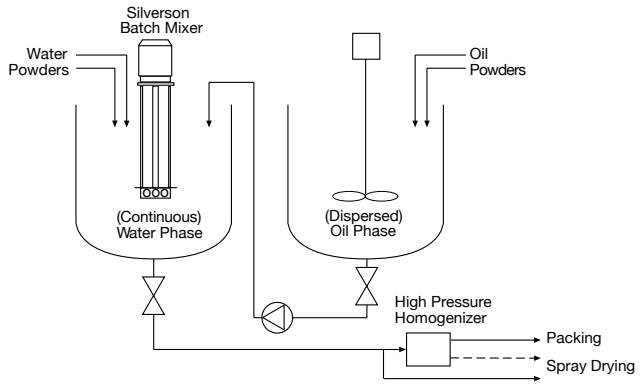
The Advantages

- After processing with a Silverson mixer, a single pass through a high pressure homogenizer is normally sufficient to achieve the end product.
- The high pressure homogenizer can normally be eliminated for spray-dried products.
- Typically a globule size of 5-7µm is achievable with a Silverson high shear mixer.
- Maximized yield of raw materials as thickening agents are fully hydrated and other ingredients fully dispersed.
- Consistent product quality.
- Agglomerate-free mix.
- Stable emulsion.
- Rapid mixing times.

The batch size, formulation, type of ingredients used and the viscosity of the end product dictates which machine from the Silverson product line is suited to individual processing requirements.

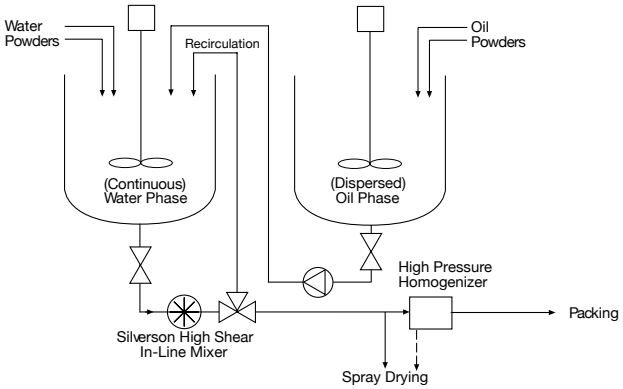
High Shear Batch Mixers

- Suitable for batches of up to 400 US gallons
- Can be used on mobile floor stands
- Can easily be moved from vessel to vessel



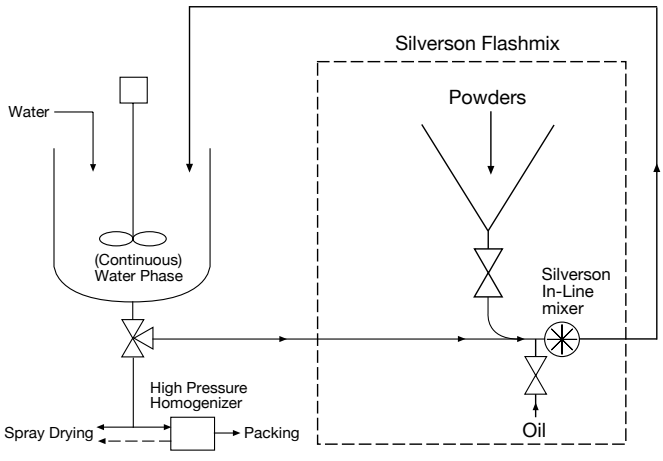
High Shear In-Line Mixers

- Ideal for larger batches
- Aeration free
- Easily retrofitted to existing plant
- Self-pumping
- Can be used to discharge vessel
- Ultra Sanitary models available
- Higher Viscosity models available



Silverson Flashmix

- Ideal for larger batches
- Capable of rapidly incorporating large volumes of powders
- Minimized aeration
- Minimized cleaning requirements
- Minimum operator input required
- Suitable for higher viscosity mixes
- Suitable for operation at higher temperatures



For more information click here to go to www.silverson.com

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