

Solutions for Your TOUGHEST  
MIXING Applications in

# FOOD

**Introduction**

Soft Drink Manufacture -

**The Process**

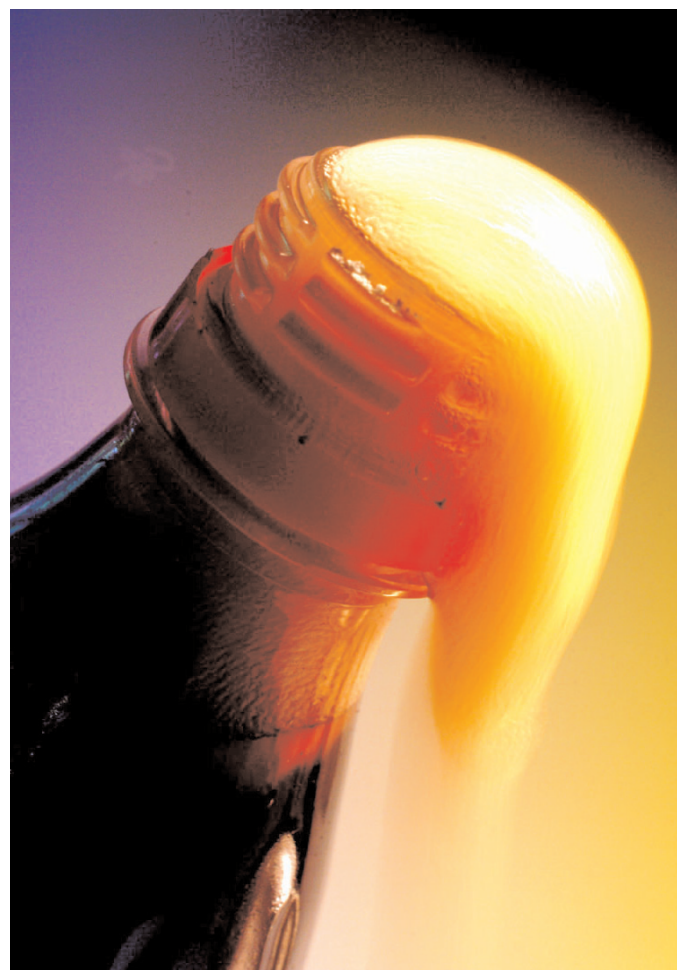
Dispersion and Hydration

**The Problem**

of Functional Ingredients

**The Solution**

**The Advantages**



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## Soft Drink Manufacture - Dispersion and Hydration of Functional Ingredients

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Ingredients such as gums, starches, alginates etc. are found in many soft drinks including fruit juices, concentrated juice drinks, flavored milks and carbonated drinks. These “functional” ingredients make up a very small percentage of the overall formulation, but contribute vital properties:

- **Thickening:** Allowing the formulator to obtain the desired viscosity and texture (known as “mouthfeel”). Particularly important with low calorie or sugar free products where the bulking effect of sugar must be replaced. A range of products are used, which include xanthan gum, pectin etc.
- **Stabilizing:** To keep particles (e.g. fruit pulp) in suspension. Several products are used e.g. CMC, starches, propylene glycol alginates (PGA), pectin, and gums such as guar and gum arabic. Carrageenan is used to stabilize cocoa in milk drinks (covered in a separate report). Many of these ingredients will provide both thickening and stabilizing effects.

### The Process

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Depending on the scale of production, the thickeners/ stabilizers may be dispersed directly into the batch, or separate premixes may be prepared for use in a variety of products. In either case, to obtain functionality from these products, they must be correctly dispersed and hydrated. A number of process requirements must be met in order to achieve this:

- The powder/liquid blending system must be capable of incorporating powders and dispersing them throughout the contents of the mix.
- The powders must be fully hydrated to maximize yield.
- Some products are not “activated” unless particles are “individualized.”
- A high degree of shear is sometimes required to activate some products and fully hydrate them.
- Some ingredient types require heating in order to hydrate.

### The Problem

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Hydration of gums and thickeners is one of the most difficult mixing operations. When using conventional agitators, a number of problems can arise:

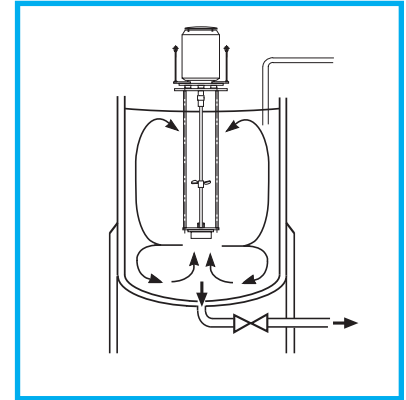
- Powder must be added at a controlled rate to reduce formation of lumps.
- Conventional agitation systems do not produce sufficient shear to break agglomerates down.
- Premixing of powders, (normally with sugar) is often carried out to reduce agglomeration; this increases costs and time.
- Where concentrates of functional ingredients are being prepared, the viscosity increases appreciably, making mixing more difficult.
- Long processing times can be required to properly disperse the powders and complete hydration.
- Incomplete hydration also reduces yield of raw materials.
- Many formulations contain unnecessarily high levels of these raw materials to compensate for poor yield and process inefficiency.

## The Solution

A Silverson High Shear Mixer can overcome these problems. There are several products in the Silverson range suitable for this application, the selection of which is dictated by individual process requirements including batch size.

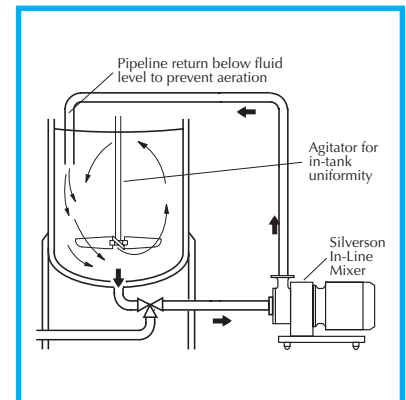
### High Shear Batch Mixers.

- Suitable for batch sizes up to 400 Gallons
- Many units can be used on mobile floor stands
- Small units available for R&D and pilot production



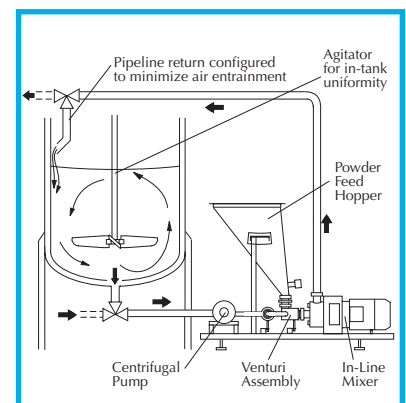
### High Shear In-Line mixers.

- Ideal for larger batches
- Aeration-free
- Easily retro fitted to an existing plant
- Self pumping
- Can be used to discharge vessel
- Ultra Hygienic models available



### Flashblend

- Pilot through large production machines are available
- Capable of incorporating large volumes of powder
- Minimized cleaning requirements
- Minimum operator input required
- Easily automated
- Minimized dusting



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