

## Silverson powder/liquid mixers

Silverson has over 60 years' experience in powder/liquid mixing and offers mixers for a wide range of materials and batch sizes.

The new **Flashmix** is a modular unit that provides a simple, effective and sanitary means of incorporating powders into liquids, even at higher viscosities and at elevated temperatures.

The **Flashblend** is a semi-automated system designed for bulk powder dispersion and ultra-sanitary applications.

The Silverson approach to powder/liquid mixing offers a number of advantages:

### **Repeatability**

Most problems that occur when adding powders into liquids are typically due to operator error - for example adding powders too quickly. With a Silverson mixer the machine dictates the powder addition rate, so repeatability is assured and a consistent homogeneous product will be produced time after time.

### **Speed**

Powder incorporation rates of up to 500 lbs/min substantially reduce process times compared with conventional methods of powder dispersion.

### **Minimum aeration**

Careful attention to design and the speed of powder incorporation ensures that aeration is kept to an absolute minimum. Ideal even for products that tend to foam or aerate easily.

### **Improved vessel hygiene**

Powder is fully dispersed before it enters the mixing vessel, preventing the build-up of partially hydrated powder on the vessel wall that can be encountered when using an in-tank agitator or mixer to disperse powders.





## Typical powder dispersion applications

### Food industry:

**Gum dispersions:** Xanthan, Guar, Acacia, etc.

**Sugar solutions**

**Ice cream:** Milk powder, Sugar, Cocoa, Stabilizers, etc.

**Yogurt:** Milk powder, Sugar, Pectin, Gelatin, etc.

**Baby milk:** Skimmed milk powder, Lactose, Soya protein, Maltodextrin, Fat

**Flavored milk drinks:** Milk powder, Cocoa, Chocolate crumb, etc.

**Soups:** Starch, Milk powder, Powdered cream, etc.

**Sauces and dressings:** Starch, Xanthan gum, Guar gum, Alginates, CMCs, etc.

**Flavorings:** Acacia gum

**Low fat spreads:** Caseinates, Gelatine, Starch, etc.

**Standardization of milk:** Milk powder, Lactose

**Sweetened condensed milk:** Sugar, Milk powder

**Jams and preserves:** Pectin solutions

**Pet foods:** Starch, Guar gum, Xanthan gum, Alginates

### Pharmaceuticals

**Tablet coatings:** Polymer dispersions

**Contact lens solutions:** Thickening agents, Salts, etc.

**Nutrient broths and media:** Yeast extracts, Proteins, Sugars, Minerals, etc.

**Syrups and linctus:** Sugar, Thickening Agents, Active ingredients

**Oral suspensions:** Thickening agents, Active ingredients

### Cosmetics and toiletries:

**Carbopol dispersions**

**Hair gels:** Carbopol

**Hairsprays and mousses:** Resin into alcohol

**Shampoos:** Sodium Laureth Sulphate (SLES) into water

**Deodorants:** CMC, Active ingredients

**Dental adhesives:** Polymer dispersions

### Beverage and brewing:

**Soft drinks:** CMC, Pectin, etc.

**Beer:** Head retaining agents, Finings

**Cream liqueurs:** Caseinates, Sugar

### Chemical and petrochemical:

**Fumed silicas** into oils, Resins and water

**Specialty chemicals:** Crystalline powders into solvents

**Drilling muds:** Continuous production of Bentonite muds

**Oil Blending:** Incorporation of lime, etc.

### Agrochemicals:

**Suspending agents:** Bentonite, Xanthan gum, etc.

**Dispersion of active ingredients**

## Flashblend powder/liquid mixing system

The Silverson Flashblend is designed to incorporate large volumes of powders on a continuous and semi-continuous basis, at rates of up to 500 lbs/min. The semi-automated system can be specified for ultra-sanitary applications and custom built to suit clients' specific requirements. There are over 500 Flashblend systems in use worldwide throughout all sectors of the process industry.

### **Advantages**

- Suitable for large scale production.
- Can be incorporated into automated systems.
- Fully sterilizable units available.
- Can be customized to suit client requirements.
- Agglomerate-free product.
- Repeatability.
- Speed.
- Minimum aeration.
- Improved vessel hygiene.



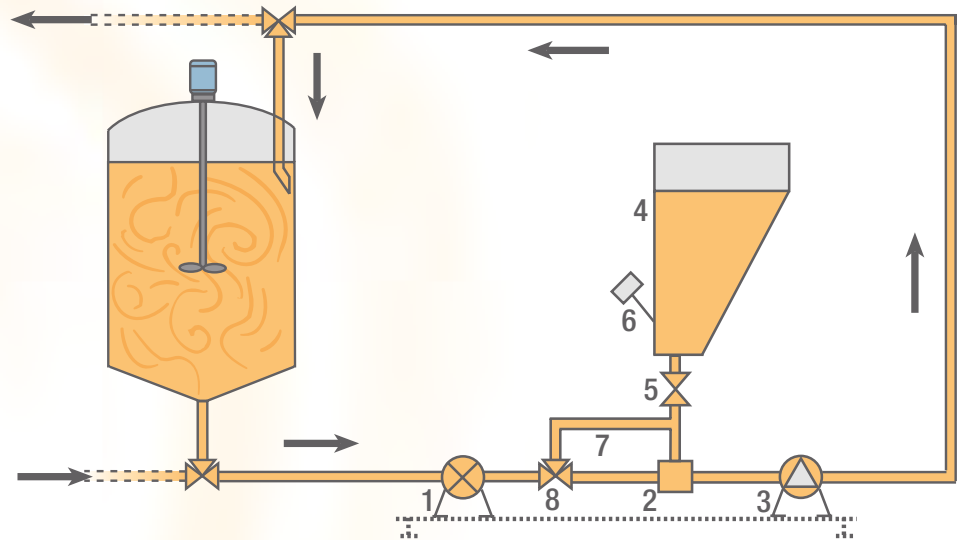
# Flashblend operating sequence

## Operation

Liquid is forced through the system by the pump (1). The liquid flow through the venturi assembly (2) creates a vacuum, boosted by the pumping action of the Silverson In-Line mixer (3). When powder is present in the hopper (4), the valve (5) can be opened and powder is drawn down into the venturi by the vacuum.

The powder/liquid mix immediately passes into the high shear rotor/stator assembly of the Silverson In-Line mixer, ensuring a finely dispersed and agglomerate-free mixture. The resultant product is passed back to the process vessel by the pumping action of the machine.

Once the hopper is empty, the sensor (6) will automatically shut



the valve, minimizing aeration. When the powder sensor closes the powder feed valve, product flow can be diverted round a bypass line (7) by the diverter valve (8).

The high flowrate in this mode ensures a scouring action of the

venturi housing, keeping the area free of any buildup of partially hydrated powder.

The bypass position is also used for Cleaning-In-Place (CIP), ensuring that the venturi area is cleaned to as high a standard as normal sanitary piping.

# Technical Specifications

## Materials of Construction

All product contact parts are in 316L stainless steel. The chassis is constructed from 304 stainless steel.

## Sealing

Sanitary single mechanical shaft sealing is standard. Double mechanical shaft seals are available.

## Motor specifications

TEFC, washdown duty and explosion proof motors are available as standard. Inverter rated, stainless steel and other motors are available as optional extras.

## ATEX

Units suitable for use in Zone 22 areas are available.

## Inlet and outlet connections

2" Tri-clamp fitting as standard. Other fittings on request.

## Cleaning

Designed for Cleaning-In-Place (CIP). Sterilize-In-Place (SIP) and Cleanroom standards are available.