SILVERSON®
High Speed High Shear Mixers

The Silverson Principle

For over 75 years Silverson has specialized in the manufacture of quality high shear mixers for processing and manufacturing industries worldwide.

With customers in over 150 countries, and serving industries as diverse as food, pharmaceuticals, cosmetics, luboils and petrochemicals, Silverson has become the world leader in the field of high shear mixing. Time after time, companies specify Silverson mixers as the “standard” equipment for their manufacturing process.

A truly international company, Silverson is represented by a network of associated companies, distributors and agents in over 50 countries, serving North America, Europe, Asia, Australasia, South America and Africa.

Why Silverson?

Speed

The exceptionally rapid Silverson mixing action substantially reduces process times compared with conventional agitators and mixers and can cut mixing times by up to 90%.

Versatility

The advantage of the Silverson approach to mixing is that any one machine can perform the duties that in the past may have required several different pieces of process equipment. This unrivalled versatility allows any machine to perform the widest range of mixing applications including blending, disintegrating, emulsifying, homogenizing, suspending, solubilizing, powder/liquid mixing and particle size reduction.

SILVERSON®

How the Silverson Works

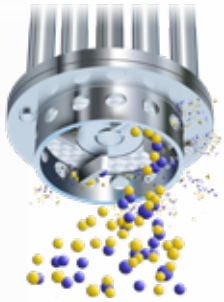
The advantages of Silverson's high shear rotor/stator mixer over simple conventional stirrers or agitators stem from the multistage mixing/shearing action as materials are drawn through the specially designed Silverson workhead - the heart of every machine.

Stage 1

The high-speed rotation of the rotor blades within the precision-machined mixing workhead exerts a powerful suction, drawing liquid and solid materials upwards from the bottom of the vessel and into the center of the workhead.

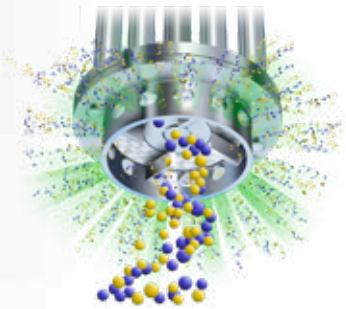
Stage 2

Centrifugal force then drives materials towards the periphery of the workhead where they are subjected to a milling action in the precision clearance between the ends of the rotor blades and the inner wall of the stator.



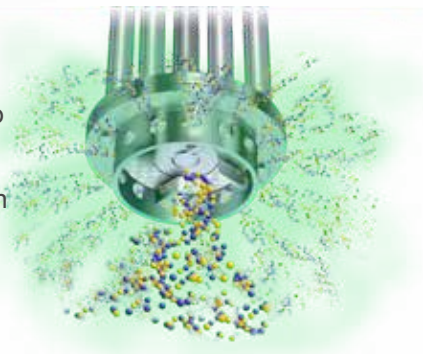
Stage 3

This is followed by intense hydraulic shear as the materials are forced, at high velocity, out through the perforations in the stator and circulated into the main body of the mix.



Stage 4

The materials expelled from the head are projected radially at high speed towards the sides of the mixing vessel. At the same time, fresh material is continually drawn into the workhead maintaining the mixing cycle. The effect of the horizontal (radial) expulsion and suction into the head is to set up a circulation pattern that minimizes aeration caused by disturbance of the liquid's surface.



Laboratory Mixers

Silverson Laboratory mixers are suitable for the widest range of applications - mixing, emulsifying, homogenizing, disintegrating, and dissolving. With a capacity from 1ml up to 12 liters and the ability to mix in-line with flow rates of up to 20 liters/minute, they offer excellent reproducibility when scaling up and provide an accurate means of forecasting the performance of larger Silverson machines under full-scale working conditions.

The Silverson L5M-A is ideal for all routine laboratory work, research and development, QA analysis and small scale production in all industries.

L5M-A Features:

- Powerful 1hp (0.75kW) single phase motor
- Touch pad control
- Infinitely variable speed control, nominal maximum speed 10,000 rpm
- Programmable integral timer, tachometer and ammeter
- Compatible with Silverson's "DataLogger" system
- Electric rise & fall stand

Pilot Scale Mixers

AX Series

Silverson offers a series of mixers for pilot scale production applications, suitable for batches of up to 50 liters.

The AX5 incorporates control and instrumentation matching the smaller L5 Series mixers above. Other models include air driven motors and more powerful 3 phase electric motors. These units can be used with an electric or mobile hydraulic rise and fall stand.

Verso

The Silverson Verso is a bench top In-Line mixer ideal for laboratory or pilot scale applications. It provides an accurate means of forecasting the performance of larger In-Line mixers under full-scale working conditions, stramlining the scale-up process.

The range includes the Verso UHS, an Ultra-Sanitary model, the Verso-HV, specially designed for higher viscosity mixes, and the FMX5, a pilot scale version of Silverson's Flashmix Powder/Liquid mixers.

Batch Mixers

Silverson offers a complete range of multi-purpose Batch mixers, able to perform the widest variety of applications - mixing, emulsifying, homogenizing, disintegrating, dissolving - with an efficiency and flexibility unmatched by other machines.

Silverson High Shear Batch mixers are robust and simple, ensuring that cleaning and maintenance is kept to an absolute minimum.

Small to medium size mixers can be used on a mobile hydraulic floor stand (local safety regulations permitting), allowing them to be moved from vessel to vessel and to be raised and lowered during operation, to give the optimum mixing position at varying stages of the process.

Silverson is the world leader in the specialized design and manufacture of large scale rotor/stator mixers with a capacity of up to 8,000 gallons. All these machines are individually built to order and constructed specifically to suit each client's requirements.

Ultramix

The Silverson Ultramix is designed for applications which are beyond the capabilities of a conventional agitator or stirrer but do not necessarily require the intense high shear of a Silverson rotor/stator mixer.

Advantages:

- Ultra -sanitary design
- Designed for Clean-In-Place operation
- Rapid incorporation of large volumes of powders
- Excellent in-tank movement
- Low maintenance
- Reduced power requirement
- Suitable for applications from aggressive chemical service to the most demanding sanitary requirements

In-Line Mixers

UHS Ultra Sanitary In-Line Mixers

Ideally suited for food, pharmaceutical and other sanitary industries, UHS range mixers are designed to comply with FDA and cGMP guidelines. The design offers single or multistage rotor/stator configurations as standard, resulting in faster mixing times, and greater particle size reduction.

Features:

- 3-A TPV (Third Party Verification) Certified and fitted with EHEDG Certified Mechanical Shaft Seals; fully EHEDG certified models are available.
- Ultra Hygienic single or double mechanical shaft seals
- Clean-In-Place (CIP) and Sterilize-In-Place (SIP) design
- Self-pumping and aeration free
- Crevice-free construction
- All wetted parts in 316L stainless steel

UHS-HV In-Line Mixers

These mixers offer exceptional flow rates and the ability to process higher viscosity products. This is achieved by a unique and innovative “pumping rotor” design which substantially increases the mixer’s capacity, eliminating the need for an additional feed pump when processing higher viscosity gels and creams.

General Duty In-Line Mixers

Silverson offers a range of In-Line mixers suitable for hazardous and aggressive chemical service.

With some of the highest rotor tip speeds and shear rates in the industry, production times can be cut by up to 90%, reducing mechanical wear and maintenance requirements while offering better particle size reduction, emulsification, rapid solubilization and dispersion. Self-pumping capacities of up to 1, 100 gallons per minute.

Optional features:

- Jacketed units for temperature sensitive products
- Non-standard materials of construction and hardened steels for highly abrasive or corrosive products

Powder/Liquid Mixers

Silverson has over 75 years of experience in powder/liquid mixing and offers mixers for a wide range of materials and batch sizes.

Flashmix Powder/Liquid Mixers

The Silverson Flashmix takes a revolutionary approach to powder/liquid mixing. This not only allows it to disperse and hydrate large volumes of powders, it means it can be used at higher temperatures and with higher viscosity mixes.

Advantages:

- Powder incorporation rates of up to 500 lbs/min
- Ideal for higher viscosity mixes and higher temperatures
- Minimum aeration
- Sanitary design
- Modular construction
- No additional pump required
- Easy to install, easy to operate and easy to clean

Flashblend Powder/Liquid Mixing System

The semi-automated Flashblend can be specified for ultra-sanitary applications and custom built to suit each client's specific requirements. It is ideal for low bulk density powders, where vacuum is required to incorporate the powder into the liquid stream.

Advantages:

- Suitable for large scale production
- Easy to incorporate into automated systems including Big Bag discharge units
- Fully sterilizable units available
- Agglomerate-free product
- Repeatable results
- Minimized aeration
- Improved vessel hygiene

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Silverson is pleased to be able to service the exacting needs of some of the finest companies in the world.

Silverson can be found on the World Wide Web at www.silverson.com