



# Bottom Entry Mixers & Disintegrators



# The Silverson Principle

**For over 75 years Silverson has specialised 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.

The key to this success is based on the professionalism and commitment Silverson shows to each of its customer’s needs. Whether supplying machines from its standard range of mixers or designing equipment specifically to meet an individual customer’s requirements, quality is guaranteed.

With a customer base that includes many of the world’s largest companies, Silverson is constantly at the forefront of new technologies. Developing and applying new high shear mixing techniques to meet these needs, Silverson has the experience, knowledge and commitment to both quality and service to solve today’s mixing needs and those of the future.

A truly international company, Silverson is represented by a network of associated companies, distributors and agents in over 50 countries, serving Europe, North America, 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 reduce 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:

- **Blending** - A homogeneous product is rapidly produced when blending liquids of similar or greatly varying viscosities, eliminating problems such as stratification.
- **Emulsifying and homogenising** - Emulsions (typically in the range of 0.5 to 5 microns) can be easily achieved.
- **Disintegration** - All Silverson rotor/stator mixers can disintegrate matter of animal, vegetable, mineral or synthetic origin in a single operation.
- **Particle size reduction** - Uniformly mill both solid and semi-solid materials into either solution or fine suspension.
- **Gelling and solubilising** - The high shear action of the Silverson rotor/stator can rapidly disperse gums, alginates, CMC, carbopols, etc., resulting in an agglomerate-free solution within minutes.

# Bottom Entry Mixers

Silverson's hygienic High Shear Bottom Entry mixers are ideal for disintegrating solids and incorporating powders that have a tendency to float on the liquid surface. They can also be used in conjunction with a slow speed anchor stirrer or scraper unit for high viscosity products.

The Silverson Bottom Entry mixer gives high shear homogenisation while the stirrer/scraper distributes the homogenised output uniformly through the vessel. This is ideal for high viscosity cosmetic, pharmaceutical and food products.

As with all Silverson rotor/stator mixers, rapidly interchangeable stators, disintegrating heads or screens are available to adapt machines for a wide range of mixing duties.

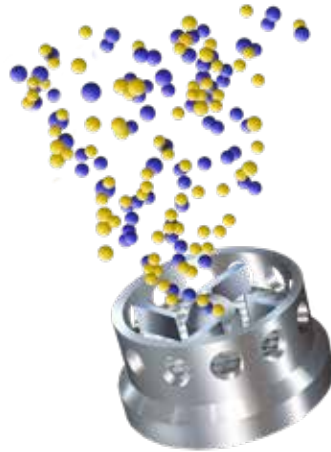


Ideal for  
Ultra-Hygienic  
Applications

# How the Bottom Entry Mixer Works

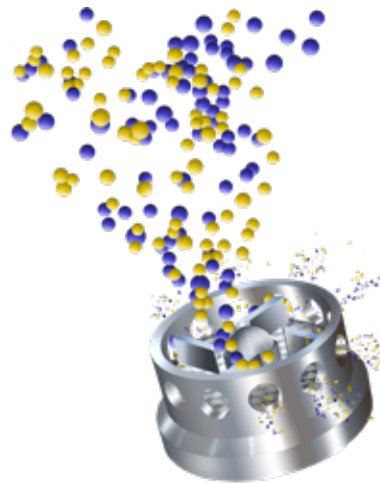
## Stage 1

The high speed rotation of the rotor blades exerts a powerful suction, drawing liquid and solid materials downwards into the centre of the workhead.



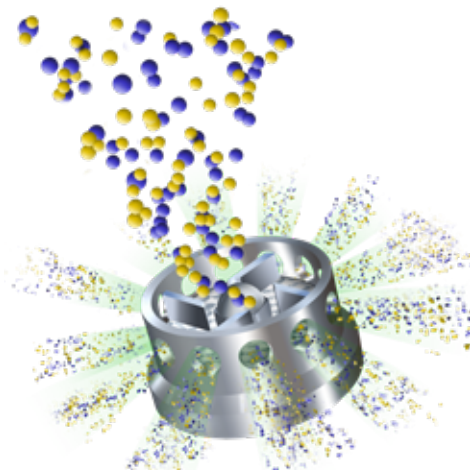
## Stage 2

Centrifugal force then drives the materials towards the periphery of the workhead where they are subjected to intense hydraulic shear in the clearance between the rotor and the stator.



## Stage 3

The product is forced out through the stator and projected radially at high speed towards the sides of the mixing vessel. Fresh material is simultaneously drawn into the workhead, maintaining the mixing cycle.



# Technical Specifications

## Materials of Construction

	Standard	Ultra Hygienic	Ultramix
Wetted Parts: 316L Stainless	●	●	●
Wetted Parts: Special Materials	○	○	○
Operating Pressure*	40 psi (2.8 bar)	40 psi (2.8 bar)	40 psi (2.8 bar)

\*Higher pressure units available on request



**General Purpose Disintegrating Head**

## Motor

TEFC	●	●	●
Other - Stainless, Flameproof/ATEX	○	○	○



**Slotted Disintegrating Head**

## Mounting

Flange Fitting	●	●	●
Clamp-on Fitting*	○	○	○

\*For smaller units only



**Square Hole High Shear Screen™**

## Sealing

Single Mechanical	●	●	●
Double Mechanical	○	○	○
Special Seal Arrangements	○	○	○
Ultra-Hygienic Specification		●	○

● Standard ○ Optional



**Standard Emulsor Head and Emulsor Screen**

# Pilot Disintegrator Plant



The Silverson Pilot Disintegrator Plant was designed to provide a small scale version of the D2500 Disintegrator/Dissolver for R&D installations, but its versatility has seen it being used as a production unit for batches of around 150 litres in applications as diverse as luboils, chemicals and foods.

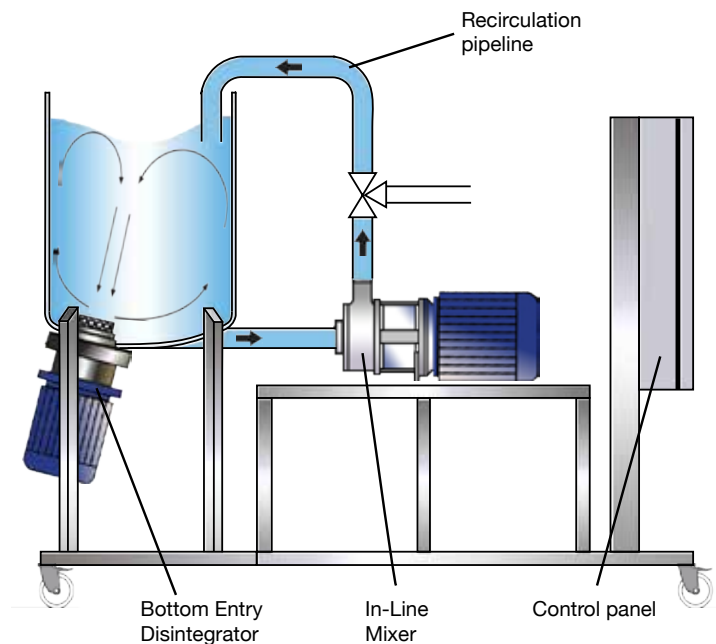
The unit comprises a vessel mounted Bottom Entry mixer coupled to a High Shear In-Line mixer homogeniser, and incorporates a control panel and all associated pipework.

During operation, the Bottom Entry mixer initially reduces solids down to granular size. The In-Line mixer is then started and the product is further reduced as it is recirculated through the high shear workhead, accelerating the solubilisation or disintegration process.

Pilot Disintegrator Plants are usually built to order and can be customised to meet each client's specific requirements.

## Typical Applications

- VM (viscosity modifiers) polymers into oil for the automotive industry
- Paper reclaim
- Pulping and disintegrating of fresh and dried fruit
- Confectionery reclaim - including hard sugar confectionery, soft gum type sweets and chocolate/biscuit waste
- Preparation of vegetable smoothies
- Re-dispersion of filter cake
- High viscosity product applications including bulk powder dispersion



# Disintegrator 2500

The D2500 incorporates a powerful and unique Silverson mixer located in the bottom of a custom-built vessel. The mixer exerts a massive suction downwards from the surface of the liquid, pulling down even the most buoyant of solids, no matter what the size. These solids are literally ripped apart and dispersed throughout the mix, and with the refinement of a Silverson In-Line mixer, included in the system, are totally solubilised or suspended.

Specified by  
All the Major  
Oil Companies





# How the D2500 Works

The D2500 is a self-contained high-powered unit consisting of a specially designed Silverson high shear rotor/stator disintegrating workhead set into a custom-built vessel coupled with a Silverson high shear In-Line mixer.

## Stage 1

The unit is charged with liquid and started. Large solids are fed into the vessel and drawn down into the workhead which will rapidly shear lumps and slices off the edges and corners. These will be drawn into the interior of the workhead, driven by centrifugal force to the periphery and further sheared by the rotor tips against the edges of the stator as they are expelled radially from the head.

## Stage 2

Rapid fragmentation of the large solids continues until all the particles are small enough to be drawn into the workhead for further disintegration. Materials are discharged horizontally from the workhead and forced up the vessel's walls, drawn into the vortex and repeatedly through the workhead for final disintegration. This cycle continues until all solids are reduced to granular size.

## Stage 3

Once the solids are down to granular size the self-pumping Silverson In-Line mixer is started. The product is drawn from the bottom of the vessel, processed through the In-Line mixer's high shear rotor/stator workhead and passed back into the top of the vessel, ensuring complete solution or suspension.



## Advantages

- Size and shape of product is inconsequential. The Disintegrator 2500 can take odd shapes and the largest sized polymer bales commercially produced.
- No need for pre-grinding, slicing or cutting of large solids. All solids are dissolved in one vessel
- Elimination of additional equipment such as grinders or choppers reduces maintenance costs and dust emissions
- Puts products into complete solution or suspension without leaving undesired particles on vessel walls
- Can handle poly-wrapped bales without prior removal of wrapper, eliminating the need for cutting and excess waste

## Typical Applications

- Rapid solution of rubbers and polymers into lubricating oils and solvents for the production of VM luboils, and adhesives
- Dispersion of filter cakes
- Disintegration of solid blocks of cheese, butter, compressed raisins and dried fruit, oleoresins and frozen meat
- Disintegration and dispersion of animal and vegetable matter
- Wet crumbing of waste rubber
- Disintegration of solid gums, resins and varnishes
- Recovery of waste confectionery



# Some of Our Clients



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## United Kingdom Corporate Headquarters

Silverson Machines Ltd.  
Waterside, Chesham  
Buckinghamshire HP5 1PQ  
England  
Tel: +44 (0) 1494 786331  
Email: sales@silverson.co.uk

## United States

Silverson Machines, Inc.  
355 Chestnut Street  
East Longmeadow, MA 01028  
Tel: +1 (413) 525-4825  
Email: sales@silverson.com

## France

Silverson France  
12 Boulevard Louise Michel  
91030 EVRY CEDEX  
France  
Tel: +33 (0) 1 60 77 91 92  
Email: info@silverson.fr

## Japan

Silverson Nippon Limited  
Onohara Higashi 4-22-3  
Mino Osaka Japan  
Zip code 562-0031  
Tel: +81-72-734-8003  
Email: sales@silverson.co.jp



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Patent Pending.