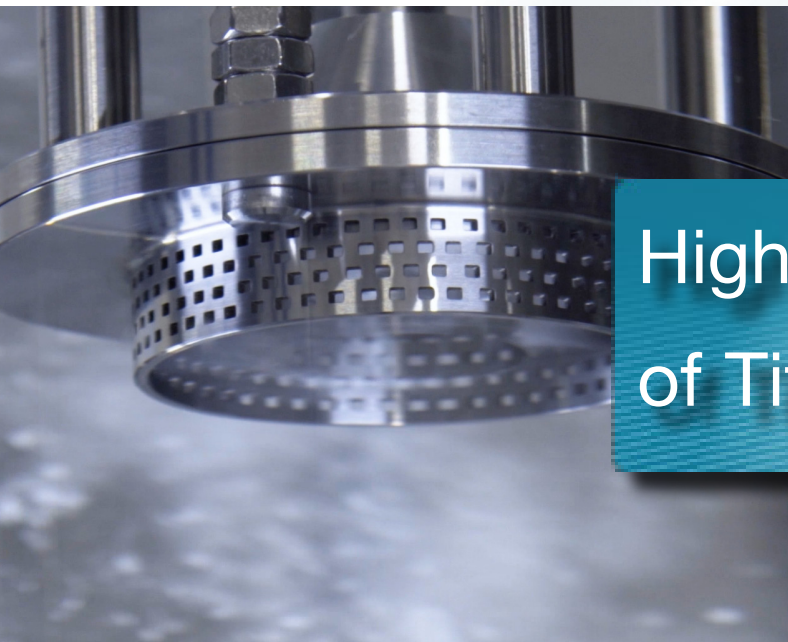


Solutions for Your TOUGHEST
MIXING Applications in

CHEMICALS



High Speed Dispersion
of Titanium Dioxide



High Speed Dispersion of Titanium Dioxide

Titanium dioxide (TiO₂) is chemically inert and has exceptional opacity and whiteness. These properties have led to its widespread use in many industries.

The Process

Titanium dioxide is most commonly supplied in powder form but may also be predispersed in oil or aqueous systems. The diversity of applications leads to many different methods of processing, however process requirements are basically the same:

- TiO₂ is usually supplied in powdered/premicronized form and particle size reduction (grinding) is not applicable in most cases.
- To maximize opacity and gloss properties, TiO₂ must be fully dispersed and evenly distributed throughout the product.
- Dust/solvent emissions must be minimized.

The Problem

The following problems can be encountered when using conventional mixers and agitators:

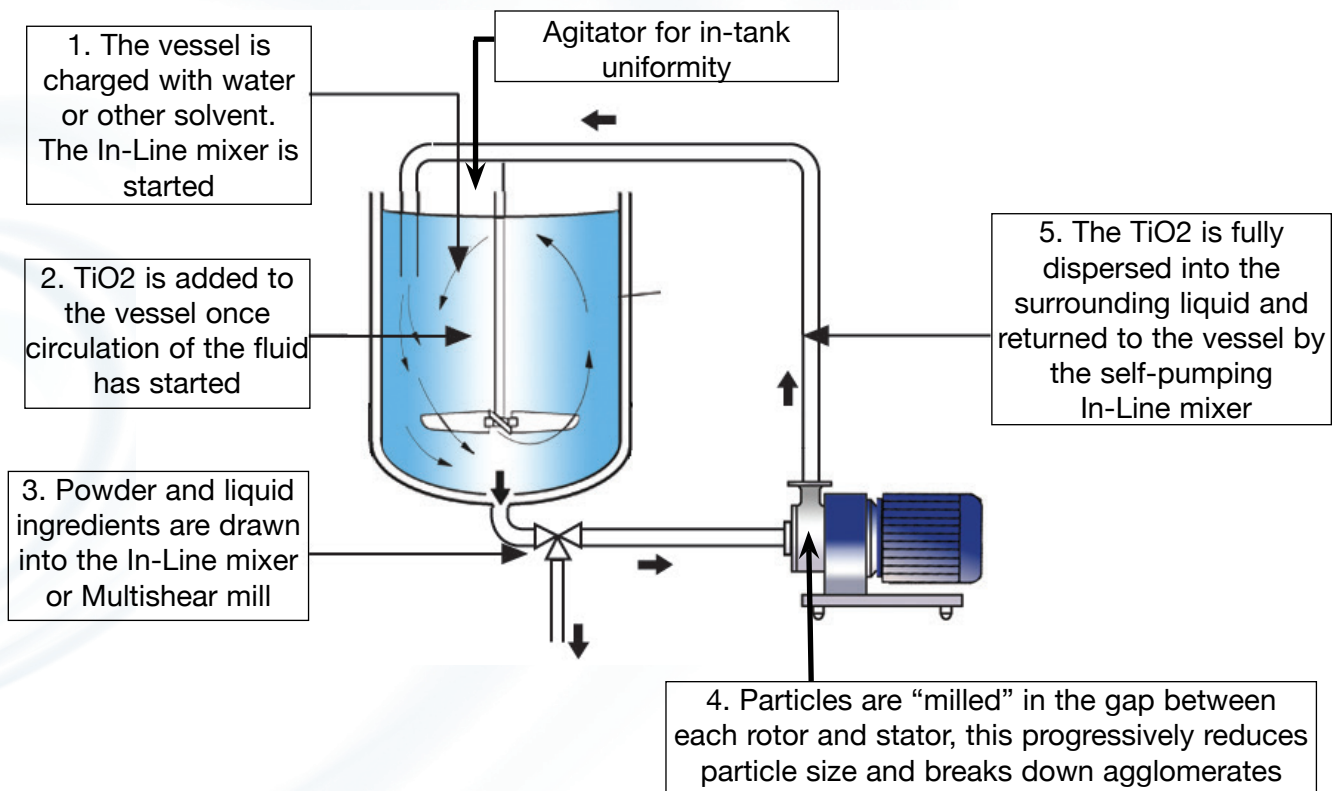
- On addition to the water, solvent, varnish or other media the particles tend to re-agglomerate.
- Conventional mixers cannot break these down effectively.
- Long mixing cycles are required to obtain uniform dispersion.
- Extended processing time contributes to solvent emissions.
- Powder has to be added under controlled conditions which can be time consuming and leads to increased dust emissions.

The Solution

The high speed, high shear operation of a Silverson mixer provides the solution to these problems.

The rotor/stator workhead rapidly disperses the TiO₂ particles into the surrounding liquid, leading to a more uniform product and shorter processing times.

This can be achieved using a batch mixer immersed in the processing vessel, or by the addition of a Silverson In-Line mixer to an existing process in a recirculation system as illustrated:



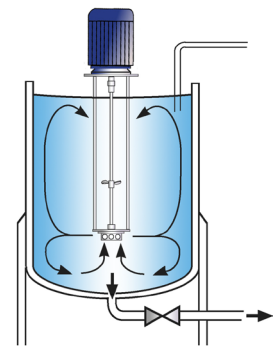
The Advantages

- The TiO₂ is added to the aqueous or organic solvent at a much faster rate, reducing dust emissions.
- The rotor/stator workhead provides an intense shearing action capable of breaking down even hard agglomerates.
- Operation can be carried out in a closed system, reducing solvent emissions.
- A Silverson mixer is more energy efficient and economical.
- The shorter processing times required to obtain a uniform dispersion reduce wear and therefore downtime and maintenance costs.

The batch size, formulation, type of ingredients and the viscosity of the end product dictate which machine from the Silverson product range is best suited to individual processing requirements. See overleaf for details:

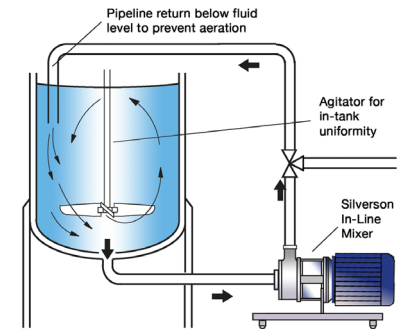
High Shear Batch Mixers

- Suitable for batch sizes up to 400 US gallons
- Can be used on mobile floor stands
- Sealed units available to control solvent/dust emissions



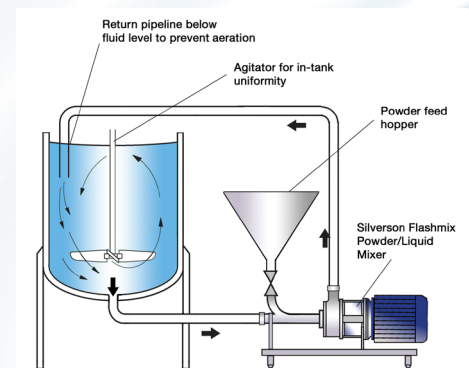
High Shear In-Line Mixers

- Ideal for larger batches
- Aeration free
- Easily retrofitted to existing plant
- Self-pumping
- Can be used to discharge vessel
- Multistage units available



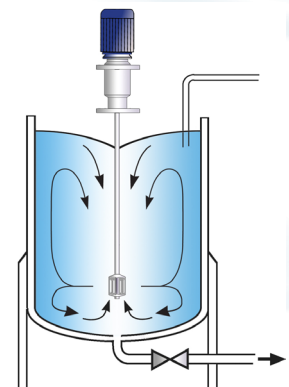
Silverson Flashmix

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



Silverson Ultramix

- Capable for rapidly incorporating large volumes of powders
- Excellent in-tank movement, even when processing high viscosity mixes
- The design is suitable for applications from aggressive chemical service to the most demanding sanitary standards and requirements
- Easy to clean - designed for Cleaning-In-Place
- Low maintenance - single-piece mixing head with no wearing parts or bushings
- Can be used in conjunction with a Silverson In-Line mixer where intense high shear is required



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

Silverson Machines, Inc. 355 Chestnut Street, East Longmeadow, MA 01028

Ph: (413) 525-4825 sales@silverson.com

Information contained in this report is believed to be correct and is included as a guide only. No warranty is expressed or implied as to fitness for use or freedom from patents. Silverson Machines reserve the right to change product specification without notice.

Issue No. 8CA4