

APPLICATION SUMMARY:

Mixing titanium dioxide powders into liquid, especially in large quantities, requires sufficient shear in order to achieve optimal functionality. The basic objective is to disperse TiO_2 into individual particles as these deliver greater opacity compared to agglomerates.

Most concentrated titanium dioxide slurries exhibit relatively low viscosity but can become quite dense and the mixer must be able to produce adequate product turnover under such conditions. Dust management is another critical factor in the mixing operation. Compared to traditional disperser mixers, new powder injection technologies enable faster material transfer and high shear powder wet-out while reducing dust generation.

RECOMMENDED MIXING EQUIPMENT FOR Concentrated Titanium Dioxide Dispersions



Ross High Shear Mixers with SLIM Technology

The Ross Solids/Liquid Injection Manifold (SLIM) Technology is a proven method for wetting out and dispersing titanium dioxide powders to produce a homogeneous concentrated slurry. The SLIM consists of a unique rotor/stator generator specially designed to create a powerful vacuum for drawing solids and injecting them into liquid under high shear. Titanium dioxide powders are wetted out right within the rotor/stator assembly where vigorous mixing takes place. Dispersion is virtually instantaneous. At the same time, rapid product turnover helps to keep solids uniformly suspended in the slurry. Most formulas include a dispersant to prevent settling long after the mixing step.

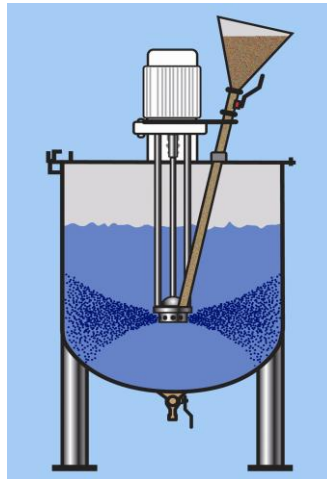
The SLIM technology is available in both batch and inline designs, making it simple to retrofit into existing processes. This system can handle very high loadings of titanium dioxide (>65%) while operating within a wide viscosity range: from water-like to up to 10,000 centipoise during powder injection. Mixtures containing TiO_2 and other fillers, especially thickeners, may be batched in a Ross Multi-Shaft Mixer with SLIM Technology which can provide satisfactory flow patterns even at elevated viscosities in the hundred thousand centipoise range.

The Ross SLIM is proven technology for fast and efficient dispersion of different types of solids including:

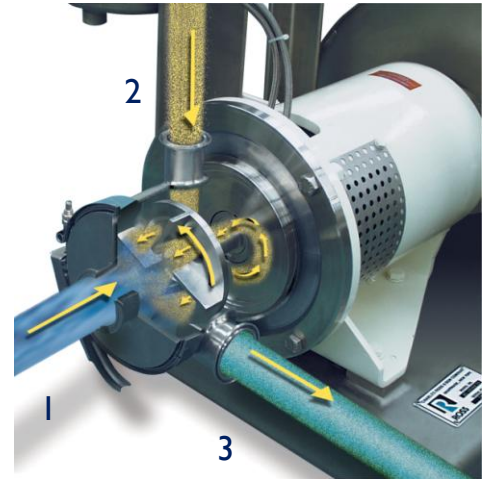
- Alginates
- Alumina
- Bentonite Clay
- Boric Acid
- Calcium Carbonate
- Carbomers
- Carbon Black
- Carrageenan
- Cellulose Gum / CMC
- Citric Acid
- Dye Powders
- Fumed Silica
- Guar
- Gum Arabic
- Hydroxyethyl Cellulose
- Magnesium Hydroxide
- Milk
- Pectin
- Starch
- Talc
- Whey
- Xanthan Gum

For more information on the Ross SLIM Technology

Visit www.highshearmixers.com or click [here](#) to download a brochure.



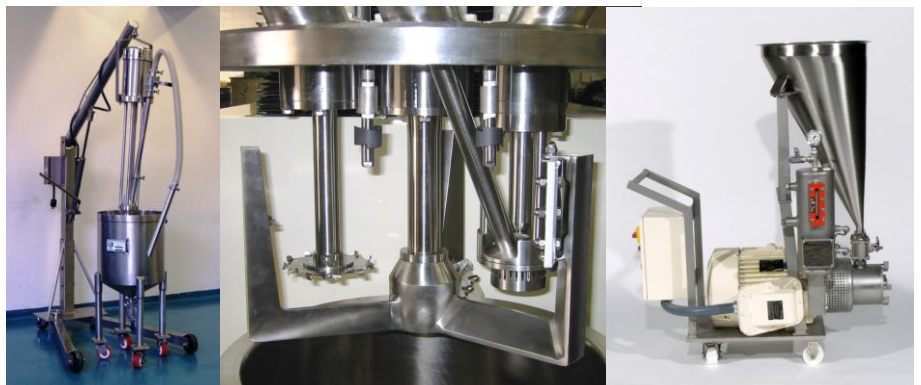
Batch SLIM. As the rotor reaches operating speed, the SLIM valve is opened and powders are quickly drawn into the batch by virtue of the powerful vacuum generated by the ported rotor.



Inline SLIM. The liquid stream (1) enters the mixer and immediately encounters the powder injection (2) at the high shear zone of the rotor/stator assembly. The resulting dispersion (3) is expelled centrifugally through the stator openings at high velocity.

Processing advantages of the SLIM Technology

- **Simple and straightforward operation.** Just turn on the mixer and start inducting powders. No eductors or vacuum pumps to deal with.
- **Cleaner and safer mixing.** A “hose & wand” attachment is used for dipping into bulk bags or containers to induct titanium dioxide powders without creating a dusty environment. Another method is to load pre-weighed solids into a SLIM feed hopper at floor level. Either way, operators no longer have to climb up mezzanines carrying heavy bags of powder or manually add raw materials from the top of the batch tank.
- **Shorter cycle times.** The SLIM routinely cuts process times by 80% or more compared to traditional batch mixing processes.
- **Higher quality dispersions.** Dispersing solids sub-surface using a SLIM mixer eliminates floating powders and stubborn lumps or agglomerates. Manufacturers achieve consistent product quality in a very repeatable and cost-efficient manner.



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