APPLICATION SUMMARY:

Pectin, a biopolymer extracted from citrus fruits and other plants, is a gelling, thickening and stabilizing agent used in many food, beverage, pharmaceutical and cosmetic products.

Available in powder form, pectin is added to liquid typically in small doses but achieving complete dissolution is often challenging. This is due to pectin’s strong tendency to form agglomerates commonly known as “fish eyes” characterized by a partially wetted outer layer that acts as a tough barrier surrounding dry particles within. Once these lumps are formed, they are very difficult to break down and hydrate completely.

Ross SLIM Technology

The Ross Solids/Liquid Injection Manifold (SLIM) Technology is well proven for fast and complete hydration of pectin powders as well as other kinds of thickening agents. The SLIM is a unique rotor/stator mixer designed to create a powerful vacuum that draws powders sub-surface and injects them directly into a high shear zone where they encounter liquid for the first time.

In conventional mixing systems, pectin powders are slowly added from the top of an agitated liquid batch to minimize agglomeration. In some processes, pectin is blended with other dry ingredients, such as sugar, before being added into liquid. Even then, prolonged mixing is often necessary to ensure complete dissolution. In extreme cases, solids are intentionally overdosed and the undispersed agglomerates are simply filtered out. This keeps cycle time within a reasonable period and ensures a homogenous product, but the additional filtration step with its associated labor and maintenance, along with wastage of raw material, entails significant costs and is hardly an attractive solution.

The SLIM offers a much simpler method: rapid addition of pectin powders without subsequent lumping. This technology combines solids and liquids at precisely the point where intense mixing takes place. The formation of “fish eyes” is greatly reduced, if not totally eliminated. Complete dissolution, even in large batches, is achieved in mere minutes instead of hours.

The SLIM technology is available in both batch and inline designs, making it simple to retrofit into most existing processes. During powder injection, liquid viscosity could be water-like or as high as 10,000 cP. After all the solids are added, product viscosity may continue to climb. For instance, a batch-style SLIM rotor/stator installed on a Ross Multi-Shaft Mixer can be used for batching formulations with a final viscosity of several hundred thousand centipoise.
The Ross SLIM is proven technology for fast and efficient dispersion of many other solids including:

- Alginates
- Alumina
- Bentonite Clay
- Boric Acid
- Calcium Carbonate
- Carbomers
- Carbon Black
- Carrageenan
- Citric Acid
- CMC
- Dye Powders
- Ground Rubber
- Guar
- Gum Arabic
- Magnesium Hydroxide
- Milk Powder
- Rosin Ester Resin
- Starch
- Sugar
- Talc
- Titanium dioxide
- Whey
- Xanthan Gum

**Processing advantages of the SLIM Technology**

- **Shorter cycle times.** SLIM users switching from conventional mixers and stirrers reduce their overall cycle time often by as much as 80% or more.
- **Simple and straightforward operation.** Just turn on the mixer and start inducting powders. No eductors or vacuum pumps to deal with.
- **Increased yield and higher quality dispersions.** By preventing the formation agglomerates and eliminating floating powders, the SLIM maximizes both yield and functionality of solid raw materials.
- **Easier material handling.** The inline SLIM mixer is usually installed at floor level so operators need not climb up a mezzanine carrying heavy bags of powder. Solids can also be delivered via automatic feeding devices.
- **Cleaner and safer mixing.** A “hose & wand” attachment is used for dipping into bulk bags or containers to conveniently induct lightweight powders without creating a dusty environment.
- **Flexibility.** A portable SLIM unit can be used in multiple process lines serving mix vessels of various sizes.

For more information on the Ross SLIM Technology

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