APPLICATION SUMMARY:

Guar gum is a free-flowing, off-white powder utilized as a rheology modifier across many industries including food, pharmaceuticals, cosmetics, paper, textile, mining and oil drilling. Different grades of guar gum lend varying thickening potencies, hydration rates, stability, thixotropy and other flow properties.

In general, only a small concentration of guar gum is needed to achieve the desired viscosity profile but dispersing the dry powders into liquid is often a processing challenge due to its tendency to form stubborn agglomerates. Slow and careful addition helps to minimize lumping but can become impractical in large-scale production. One proven solution is sub-surface powder injection under high shear conditions as detailed in this bulletin.

Ross SLIM Technology

The Ross Solids/Liquid Injection Manifold (SLIM) Technology is well proven for fast dispersion of guar gum as well as other kinds of thickeners, stabilizers and gelling agents. The SLIM is a unique rotor/stator mixer designed to create a powerful vacuum that draws and injects powders directly into a high shear mixing zone without the use of external eductors or pumps.

In conventional mixing systems, guar gum is slowly added into a vigorously agitated liquid batch to minimize agglomeration and floating powders. By comparison, the SLIM allows for rapid sub-surface addition of solids while helping to prevent lumping. By combining the dry gum powders and liquid at precisely the point where intense mixing takes place, the formation of lumps and “fish eyes” is greatly reduced, if not eliminated. Dispersion is virtually instantaneous and as a result of the shorter cycle time, gum solutions prepared in a SLIM mixer are less prone to permanent viscosity loss due to over-mixing.

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 keep increasing as the gum particles continue to swell and hydrate. 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
- Gum Arabic
- Magnesium Hydroxide
- Milk Powder
- Pectin
- Rosin Ester Resin
- Starch
- Sugar
- Talc
- Titanium dioxide
- Whey
- Xanthan Gum

**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.
- **Shorter cycle times.** SLIM users switching from conventional mixers and stirrers report as much as 80% reduction in overall cycle time.
- **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.