APPLICATION SUMMARY:

Technical-grade magnesium hydroxide slurries are relatively low viscosity aqueous suspensions used in wastewater treatment, flue gas desulfurization, heavy metal precipitation, paper bleaching and other industrial neutralization processes. The pharmaceutical-grade variety is the antacid and laxative commonly known as “milk of magnesia”.

Wetting out and dispersing magnesium hydroxide powders to make a concentrated slurry can be challenging even with the aid of chemical dispersants. Inadequate mixing leads to issues like floating powders, long cycle times, and phase separation (very limited stability). One proven solution is to introduce the dry ingredients via sub-surface injection under high shear conditions as described in this bulletin.

RECOMMENDED MIXING EQUIPMENT FOR

Magnesium Hydroxide Slurries

Ross SLIM Technology and Ultra-High Shear Mixers

The Ross Solids/Liquid Injection Manifold (SLIM) is ideal for fast and thorough dispersion of magnesium hydroxide powders into liquid. At the heart of this technology is a unique rotor/stator mixer designed to create a powerful vacuum that draws powders sub-surface and injects them into a high shear mixing zone.

Some magnesium hydroxide powders have a tendency to float when added from the top of the agitated liquid and sufficient vigorous mixing is required to achieve a smooth, uniform and stable dispersion. The SLIM is advantageous in the preparation of magnesium hydroxide slurries not only because it turns at high speeds but because of the way it introduces powders: solids and liquids are rapidly combined sub-surface at precisely the point where intense agitation takes place. Dispersion is virtually instantaneous; yet, the mixing action disperses agglomerates without changing the size and properties of individual particles. Floating powders and excessive dusting are also eliminated.

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 centipoise (cP). Solids loading is normally not a limiting factor; even concentrated magnesium hydroxide aqueous slurries (>60% solids by weight) are under 1,000 cP which a stand-alone SLIM Mixer can easily handle. More viscous paste-like formulations are processed in Multi-Shaft Mixers equipped with supplemental agitators in addition to the SLIM rotor/stator.

Ross also offers Ultra-High Shear Mixers for magnesium hydroxide slurries and pastes requiring more aggressive deagglomeration. These mixers deliver greater throughput and efficiency compared to colloid mills, media mills and other wet milling equipment.
The Ross SLIM is proven technology for fast and efficient dispersion of many other solids including:

- Alginate
- Alumina
- Bentonite Clay
- Boric Acid
- Calcium Carbonate
- Carbomers
- Carbon Black
- Carrageenan
- Citric Acid
- CMC
- Dye Powders
- Ground Rubber
- Guar
- Gum Arabic
- 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 inducing powders. No eductors or vacuum pumps to deal with.
- **Shorter cycle times.** SLIM users switching from conventional mixers and stirrers reduce their overall cycle time often by as much as 80% or more.
- **Increased yield and higher quality dispersions.** By dispersing agglomerates and eliminating floating powders, the SLIM maximizes the functionality of the solids, dispersants and other raw materials.
- **Robust mixing.** Sufficient product turnover and powder injection are achieved even at very high solids content.
- **Easier material handling.** The Inline SLIM 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.
- **Flexibility.** The 3A-approved Inline SLIM, well suited for sanitary and technical-grade slurries, can be supplied on a mobile cart to serve virtually any size vessel located anywhere in the plant.

For more information on the Ross SLIM Technology

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