LUDOX® Colloidal Silica
Improve Performance in Shotcrete and Sprayed Concrete Applications

An Innovative Approach

There’s really no comparison between silica fume and colloidal silica when it comes to value and performance in sprayed concrete applications. LUDOX® Colloidal Silica from W. R. Grace & Co. offers more surface area for better bonding in a consistent, highly pure engineered material. Colloidal silica is a pozzolanic-based rheology control agent which suspends fine amorphous nanometric silica particles in a liquid form. It consists of non-porous, spherical, non-aggregated particles dispersed in water free from chlorides and with low alkalinity.

Unlike silica fume, which is a waste by-product of silicon and ferrosilicon metal production, LUDOX® Colloidal Silica is a synthetic silica product that uses innovative technology that can be used in both wet and dry-mix applications to boost productivity, reduce cost, and deliver an end product that is stronger, more consistent, and safer to use.

- Improved bonding and adhesion
- Improved sprayability
- Reduced dosage rate
- Shortened set time
- Increased layer thickness
- High early-stage strength
- Less rebound
- No dust
- Easier handling and improved mixing
- Safety: contains no crystalline silica

The Benefits of Colloidal Silica in Shotcrete and Sprayed Concrete

Top reasons to replace traditional silica fume with colloidal silica in sprayed concrete applications

1. Performance:
   Colloidal silica provides greater cohesiveness in the shotcrete mix, improving sprayability, reducing rebound, and increasing layer thickness. A much higher surface area accelerates the hydration process, reducing setting time and increasing early-stage strength.

2. Quality:
   Due to its liquid form, colloidal silica is more effectively dispersed than silica fume, reducing the mixing time and minimizing the risk of lump formation in concrete. Plus, the use of highly pure raw materials with uniform particle size and distribution eliminates the batch-to-batch variability of silica fume.

3. Health, Safety and Product Handling:
   Silica fume is a potential hazard to mixers who need to lift and dump heavy bags, which can lead to the generation of nuisance dust that contains trace amounts of crystalline silica. Colloidal silica is a liquid containing non-crystalline silica, which generates no dust and can be easily dispensed. Plus, the facilities required for storing and dispensing colloidal silica are less expensive and require less attention.

A More Cost Effective Solution

Colloidal Silica vs. Silica Fume

Besides better performance, quality, and safety, colloidal silica is less than half the cost of silica fume.
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Partner with a Global Leader in Colloidal Silica Technologies

Grace is a leading global supplier of LUDOX® Colloidal Silica. LUDOX® Colloidal Silica products are known for their consistent quality, narrow particle size distribution, and purity and are backed by Grace’s sales and technical support. For more information and support in selecting the right grade for your specific application, please contact your Grace representative.

Talent, Technology, and Trust

Grace’s experienced R&D experts and technical specialists form strong collaborative relationships to ensure products are optimized for our customers specific applications.

Grace is a leading global supplier of engineered materials and catalysts that help improve the products and processes of our customers in more than 85 countries with headquarters in Columbia, MD, USA.

Magnification of discrete, spherical, amorphous LUDOX® Colloidal Silica particles dispersed in water.