ANGSTROMSPHERE DISPERSION TECHNIQUE

Redispersing Silica Powders:

Standard dry form Angstromsphere silica powder can be readily redispersed into most polar-type solutions (e.g. Water, Ethanol etc.) if the proper equipment is used. In addition, since the surface of standard dry-form silica powder has a large quantity of silanol (Si-OH) groups it is very hydrophilic and disperses best in water. Ammonia is also used at times to aid in the dispersion of powders quickly and tends to give the highest quality dispersion but is not absolutely needed to disperse powders. From the literature, it has been reported that the best dispersions of silica powders in water are at a pH of 10. Other dispersing agents are also available like the surfactant Triton X100.

It is also important to note that this report only details a common method of dispersing silica powder in an aqueous solution. Fiber Optic Center has many customers who have developed their own proprietary methods to disperse Angstromsphere silica powders in a wide range of systems from polymers, electronic pastes, ceramics and glass materials.

Equipment List:

Below are the types of equipment Fiber Optic Center uses to disperse silica powders in solution. Other brands and types may be substituted.

> Probe Type Ultrasonicator: Branson Model 450 Sonifier
>
> Glassware: Available from any Chemical supply house (e.g. Fisher, VWR etc)

Typical Example:

In a 500ml-glass beaker add 200ml of distilled water. Optionally 10 grams of concentrated ammonia or other surfactant is added to the distilled water and stirred well. 50 grams of dryform silica powder is then added to the solution. A probe type ultrasonicator is then used to sonicate the solution until all the powder is completely redispersed in solution. Small particle systems may take 5 to 8 minutes for complete redispersion. The ratio of silica powder to water can be adjusted per the customers' needs. Some particle size standard solutions available from other companies may have as little as 1% silica powder per water.