

What is Silica Gel; How does Silica Gel work?

Silica gel is an amorphous form of silicon dioxide, which is synthetically produced in the form of hard irregular granules (having the appearance of crystals) or hard irregular beads. A microporous structure of interlocking cavities gives a very high surface area (800 square meters per gram) of silica gel. It is this structure that makes silica gel a high capacity desiccant. Water molecules adhere to the silica gel crystal surface because it exhibits a lower vapour pressure than the surrounding air. When equilibrium of equal pressure is reached, no more adsorption by silica gel occurs. Thus the higher the humidity of the surrounding air, the greater the amount of water that is adsorbed by silica gel before equilibrium is reached. It is in these higher humidity conditions (above 50% Relative Humidity) that stored or in-transit items are susceptible to damage.

The beauty of silica gel is the physical adsorption of water vapour into its internal pores. There is no chemical reaction, no by products or side effects. Even when saturated with water vapour, silica gel still has the appearance of a dry product, its shape unchanged.

Silica gel was developed just prior to WWI and was used in Allied gas masks; then, in WWII silica gel was used extensively to keep penicillin dry. Silica gel remains the highest capacity adsorbent available today. Not a "gel" as commonly thought of, and not to be confused with "silicon gel", silica gel is a porous, granular form of silica, synthetically manufactured from sodium silicate.

The internal structure of each small silica gel granule is composed of a vast network of inter-connecting microscopic pores, which attract and hold moisture by a phenomena known as physical adsorption and capillary condensation. (It sounds ridiculous, but a single teaspoon of Hydrosorbent Silica Gel has an internal adsorptive area equivalent to a football field, including the two end zones.) Hydrosorbent Silica Gel is inert, non-toxic and safe to use to protect foods, medicines, sensitive materials, electronics, films, etc. Even when saturated with adsorbed moisture, silica gel looks and feels dry to the touch.

Hydrosorbent Silica Gel can be reactivated indefinitely. Each Hydro sorbent Silica Gel unit has a built-in indicator which turns from blue to pink signaling when the product is saturated with moisture and needs reactivation. Once saturated with moisture, silica gel can be easily reactivated in a conventional oven for lifetime protection. Since World War II, silica gel has been the desiccant