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A new concept of desiccant

Atmospheric desiccation has traditionally been accomplished through the use of crystalline forms of dehydrated silica, which are available in both indicating and non-indicating styles. The indicating form of silica are achieved with a permeating chemical that in its desiccated state is a light to dark blue colour, indicating that the silica is in a dry condition. Upon becoming saturated with its capacity to absorb moisture or water vapour, the blue colour changes to a light rose or red colour. These crystalline products are referred to as Silica Gel. As well, select dried clays are also used as desiccants and are commonly formed into small round pellets referred to as molecular sieve.

These products function on the basis of vapour pressure differentials that may exist between the moisture within an atmosphere and the vapour pressure within the silica crystals or molecular sieve pellets. Due to this differential, moisture vapour will seek equilibrium, entering into the lattes structure of the silica crystal or clay structure. These type products have limitations in their performance due to the nature of their structure. In crystalline gels, the rigidity of the structure limits the volume of moisture or water vapour that can be contained within the lattes of the structure. Molecular sieve pellets can receive more volume of water vapour than rigid crystalline gels; however, upon reaching their capacity in vapour retention, any excess of moisture can turn the clay into a water-saturated form of mud.

A new type of desiccant material has been developed by cross-linking a polymerized form of acrylic acid into a dry granular form of super-absorbing polymer. Developed into a desiccant by PTS. These products desiccate moisture from an atmosphere by the attraction of negative valiant groups that are arrayed on the backbone of the polymer to the positive valiant of H20 molecules that are dissolved as humidity in air or the atmosphere of a closed container. These materials perform in a much different manner than does rigid or crystalline structures. Being hydroscopic, as water vapours are drawn to the surface of the polymer by valiant attraction, the polymer structure will soften slightly to expand the structure to accommodate a greater volume of H_2O within the polymer backbone structure, which is then tightly bound by a hydrogen bond to the polymer backbone.