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Desiccant article featuring JMP's UniSorb desiccants

Still working up a sweat

Producers of container desiccants are hard pressed to meet demand as further technical innovation and better global availability is continuing to boost sales.

The container desiccant has long been an unsung hero of the global transport industry, as it has prevented countless insurance claims by protecting shipments from condensation damage. Whenever a container is loaded and sealed, some moisture invariably becomes trapped either in airborne form (depending on the external ambient and relative humidity) or being present in timber packing or dunnage materials, the container floor or the cargo itself.

This "invisible" captured water can amount to many litres when relative humidity is high, just about all of which is precipitated when the container travels between equatorial/tropical and temperate zones. It is by preventing this release as condensation – or in the worse instance as "container rain" – that desiccants have proven effective and gained increased acceptance on the majority of the world's container traders.

Why not?

There is, indeed, no rational reason today why anyone shipping goods in containers should avoid the use of desiccants, given that, for a cost of US$100 or less, an entire consignment – often worth many thousand times more – can be protected from all types of condensation damage. This can range from mould-infestation/rusting of metal products or labels peeling free, at the very least, to total spoilage and a complete write-off of the freight value. Very few shipments are immune to the effects, while eve then mildest deterioration can render the product unfit for sale after delivery to the consignee.

The argument favouring container desiccants has been made even more compelling in recent years as their formulation has been improved. The earlier deployment of silica gel has given way to a more highly-customised preparation, incorporating calcined clay and hygroscopic chemicals, the most popular of which is anhydrous calcium chloride. These are highly efficient in mopping up free moisture released within a container load as it experiences changes in temperature, and can remain active for many weeks at a time.

The standard formulation is also now of “non-drip” type, thereby eliminating any risk of leakage and preventing the release of moisture back into the environment. By contrast, silica gel is generally less effective in treating a whole container load and instead remains far more suited for smaller scale applications, providing more localized protection inside cartons or other packaging material. Here, it gives a valuable secondary level of protection for more sensitive commodities, such as textiles, leather ware, paper, wooden furniture and electronic goods.

Key aspect

A key aspect of today’s standard container desiccant is its containment in a non-woven Tyvek outer lining. This material is patented by the US chemical manufacturing conglomerate, DuPont, and has a highly complex microporous cellular structure, which effectively allows water molecules to pass through in one direction, but not the other way. The captured water is thus drawn into the desiccant pack and prevented from escape again.

The Tyvek formulation is also wholly inert and so unaffected by the aggressive chemicals housed within. It is of highly durable construction, being practically impossible to puncture through rough handling, and can be positioned in tight corners, deep within the container consignment without any risk of rupturing. These properties have encouraged its selection by most manufacturers as a standard desiccant bag material, in place of cloth or other absorbent fabrics. The non-woven Tyvek wrap is further suited for the incorporation of other useful add-on features, such as a humidity indicator window.

The desiccant itself is also of an increasingly standardized formulation. Even though each manufacturer has its own individual – and often closely guarded – recipe, just about all make use of some form of heat-treated, but naturally occurring mineral clay in conjunction with the aforementioned dried calcium chloride. Many also incorporate a separate gelling agent within the mixture to further bind in captured moisture and so minimise any risk of leaking. The clay component is usually of volcanic origin, and amongst the more popular types are Montmorillonite, Bentonite or Diatomite, and those meeting the MIL-D-3464E specification in the US.

These, depending on their precise treatment and proportion within the calcium chloride mix, are capable of absorbing a moisture equivalent greater than their original combined dry weight. The precise formulation also regulates the aggressiveness of absorption and longevity of application, with some offering active protection for more

than 50 days before saturation is reached. A further plus point is that all desiccants of this type are environmentally friendly (as is the Tyvek casing) and can be disposed of safely after use without any special treatment.

Doubling Up

CONTAINER INDUSTRY

JMP Holdings is looking to double the absorption capacity of its UniSorb desiccant without adding to its cost

JMP Holdings, of Australia, has increased its focus on research following the successful launch of UniSorb a year or so back. The company is current looking to double the absorption capability of the existing product, from its current 100% of dry weight to 200%, but for no additional cost. UniSorb has already been shown to perform well in independent tests and is now being marketed across South East Asia through two new local offices, opened in Thailand and Singapore. New Zealand is similarly served by way of a local JMP subsidiary, while the product is now being distributed in the UK and throughout Europe.

UniSorb has proved particularly popular with shippers of foodstuffs and electronic goods. The basic pack is of 1kg or 2kg size and contained within a double Tyvek (plus single non-woven polypropylene) layer to render it wholly leak-proof. The desiccant itself is manufactured by a proven source in China, and vetted constantly to ensure the necessary quality is maintained. The supplier is the only one in China to have received a German DIN certification.