

August 2008

ProSorb

Technical information

The relative humidity (RH) in a given space drops as the temperature increases - as the air is able to absorb more moisture - and rises as the temperature falls. These physical properties change when organic materials are present in sufficient quantities. For example, the RH increases in a microclimate with a rising temperature, when more than 100g of organic matter per m³ is present.¹ Inside the PROTECT Magnetic Frame, which contains a large amount of organic material in the ratio of air to cellulose fibre, a reduced increase in RH with rising temperatures - or drop in RH with falling temperatures - is recorded.

In the search for a suitable buffer material to stabilise the microclimate in the PROTECT Magnetic Frame, the choice settled on ProSorb, as it has the best properties in the 40% to 60% RH range. In relation to its own weight, it can store considerably more moisture than other silica gel products. The amorphous alumino-silica gel consists of 97% SiO₂ and 3% Al₂O₃, is available as solid pellets and at 750m² per gram has a very large molecular surface. In contrast to ArtSorb, it is non-corrosive on contact with metals. Due to its capacity to absorb and discharge moisture, ProSorb is able to keep relative humidity stable at the level set in the preconditioning process. ProSorb does not become depleted and can be re-used. Whilst for other silica gels this facility deteriorates noticeably even after 1-2 years, ProSorb is one of the products with the longest lasting stability. Specific data on durability are difficult to establish due to the different conditions.

¹ Thomson, G.: Relative Humidity – Variation with Temperature in a Case Containing Wood, Studies in Conservation 9, 1964, pp 153-169

Moisture absorption at mid-range humidity (40 – 60 % RH)

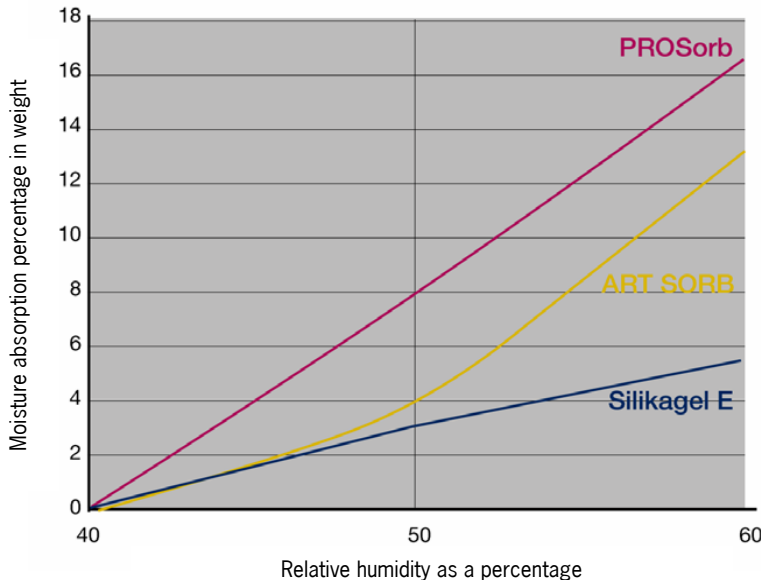


Illustration: ProSorb demonstrates the best moisture absorption in the 40% - 60% humidity range in comparison to other silica gels.

For the series of tests on the PROTECT Magnetic Frame, a quantity of 50g/m² was investigated which is sufficient to provide a constant microclimate even with extreme climatic variations. This buffer material is easy to handle, as it is sealed into small packs made of PE film and Tyvek, a water vapour-permeable plastic fleece, and dust cannot escape. The corrugated cardboard filler in the backing is cut in the area of the cavities to take the packs and with its air pockets thus provides for a rapid humidity exchange where there are fluctuations in temperature.

Exhibits benefit from the optimum protection provided by the combined effect of the two buffer materials, the cellulose in the corrugated cardboard with its huge storage capacity and the ProSorb as a rapid-reaction humidity buffer.

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