

>> The Environmental Impact of Silica Gel, Calcium Chloride and Bentonite Clay Desiccants

As brands seek to improve the sustainability of their packaging they often overlook the material makeup of the desiccants they use. This guide examines the environmental impact of the most commonly used desiccants; **silica gel**, **calcium chloride** and **bentonite clay**, from the perspective of the ingredient manufacturing process as well as the packaging. Packaging materials are an especially important consideration because packaging comprises 95% of a typical desiccant's total makeup, with the ingredient comprising the remainder.

Silica Gel

Silica gel is a synthetic material manufactured through an intensive multi-step process that requires significant chemical, water and energy inputs, and results in high levels of pollution and waste-water*. Additional harmful chemicals including methyl violet and cobalt chloride are often added as moisture color indicators. The production of silica gel is such a dirty industry that the government of China, the primary global source for silica gel, has for many years been ordering large scale closures of silica gel factories.

Silica gel is commonly packaged in Tyvek (high density polyethylene) or other forms of plastic sachets which are not biodegradable and are difficult to recycle. When we toss them into the trash they end up in landfill or oceans where they will remain indefinitely and can cause harm to wildlife and ecosystems. While it is possible to package silica gel in paper sachets, most manufacturers do not have the technical know-how and will get around this by using sachets which feel like paper but which in fact have a thin plastic inner-liner.



Fig. 1 Silica gel packaged in polyethylene (plastic)

Calcium Chloride: Micro-Pak MPX2® Desiccants

Calcium chloride is most commonly produced synthetically from a reaction of hydrochloric acid on calcium carbonate, in a process that requires significant inputs of each material in addition to water and energy. Calcium chloride is extremely hygroscopic, with the capacity to absorb several times its weight in moisture, however when it does absorb moisture it turns from a powder into a highly corrosive liquid brine.

To prevent leakage, calcium chloride desiccants require a double layer of packaging; an inner plastic pouch with an outer non-woven layer. As a result, they tend to use 4X more packaging materials than other desiccants and are always packaged in plastic.

Find more information on Micro-Pak MPX2® Desiccants



Fig. 2 Calcium chloride packaging consists of an inner plastic pouch and an outer non-woven layer

Bentonite Clay: Micro-Pak Dri Clay® Kraft

Bentonite clay is a naturally occurring mineral. The simple production process consists of extracting, drying and grading the minerals before packaging them. This process requires zero chemical inputs or additives, no water consumption, and uses minimal energy resulting in a small carbon footprint. In the case of Micro-Pak Dri Clay® Kraft, the bentonite clay we use is responsibly extracted at partner-owned mines and processed in partner-owned facilities, with a clear chain of custody from the mine to the end product. Once extraction is complete, the sites are restored and re-cultivated to an equal or better state than when operations began.

Bentonite clay remains dry at all times so it can be packaged in paper. Dri Clay® Kraft is packaged in plastic-free Kraft paper that is biodegradable and FSC (Forest Stewardship Council)-certified.

[Find more information on Micro-Pak Dri Clay® Kraft](#)



Fig. 3 Dri Clay Kraft. A 100% natural desiccant packaged in plastic-free, biodegradable Kraft paper.

The Environmental Impact of Using 100 Million 5-Gram Sachets of Each Desiccant

	Silica Gel	Calcium Chloride	Dri Clay® Kraft Bentonite Clay
Chemical Inputs (Metric Tonnes)	950	1,470	Zero
Fresh Water (Liters) used in production	10,000,000	90,000	Zero
Plastic Packaging	47 Metric Tonnes Equivalent to 2,350,000 one-litre plastic bottles	140 Metric Tonnes Equivalent to 7,000,000 one-litre plastic bottles	Zero Plastic-free packaging

Micro-Pak Dri Clay® Kraft is by far the most sustainable desiccant option as it is 100% natural, plastic-free and packaged in biodegradable Kraft paper.

For advice on desiccants please contact
Micro-Pak: info@micropakltd.com

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***For more information on the silica gel production process read the [Dri Clay® Kraft vs Silica Gel Sustainability Summary](#)**

Factors to Consider When Choosing a Desiccant? [Find out the recommended applications for bentonite clay and calcium chloride desiccants](#)

The Importance of Eliminating Silica Gel [Find out the risks involved with using silica gel](#)