



Alginate is a powder made of between 5 and 15 chemicals compounds, including “alginic acid”. Alginic acid is a powder derived from seaweed that consists of long, chain-like molecules known as polymers. Alginic acid is a thickener that is used in many food products like ice cream, soup and salad dressing. It is also used to thicken printing inks so they hold onto the printing plates better.

When water is added to the alginate powder and mixed, the result is a thick liquid. Depending on how much water is added, the consistency can range between the thickness of pancake batter and that of cream cheese. Certain applications require a thicker mix and some require a thinner one.

On the molecular level, calcium ions (individual atoms) are freed from the calcium donor, Calcium Sulfate (same as chalk), and they act like molecular glue. When the alginate begins to set, they glue the alginic acid polymers to each other in a three dimensional matrix similar to a sponge. Since the individual elements of the matrix (polymers) are flexible, the entire mass is flexible. The other chemicals in the mix affect mixing properties, setting time and final set properties.

This sponge-like structure can hold water for a time, but the water will eventually dry out of the alginate matrix by evaporation and syneresis and it will shrink in direct proportion to the percentage of the initial water that has exited. This is why its important to pour your casting as soon as possible after making your alginate mold.

The Difference between Dental Alginate and Accu-Cast Alginate-

Dental alginate is designed to take a relatively small impression in a person’s mouth within the confines of a fairly stiff container (the dental tray). Being in the mouth, the alginate should be fairly thick so it won’t run down the patient’s throat and gag them. It also needs to set pretty quickly because there will less time for the patient to gag. Being in the dental tray means that the alginate doesn’t need to be that strong when set because it won’t be subjected to great stress. Also, the inside of the mouth can usually tolerate cold water temperatures for a couple of minutes so warm water temperature isn’t necessary.

Accu-Cast alginate on the other hand often is mixed and used in large quantities so the stresses on it can be much greater. Accu-Cast alginates are formulated with a higher percentage of alginic acid (the actual gelling agent) to make the final set material tougher. Since they are often used against a person’s skin where cold water temperatures can be quite uncomfortable, Accu-Cast alginates are formulated to be mixed with warmer water when necessary to make the subject more comfortable. Also, a quick setting time would be very inappropriate for large projects where it can take several minutes to mix and apply the alginate to the subject.

We were pioneers in the development of long setting alginates for prosthetic use.