Testing a New Alginate or FiberGel E F/X Grade Alginate, *Fame or Shame*

by David E. Parvin, A.L.I.

With so many alginates on the market, is there room for another? Almost certainly not unless there is something that definitely separates it from the rest. Ed McCormick of ArtMolds is convinced that his new FiberGel E F/X Grade alginate may just have what it takes and has filed for a patent.

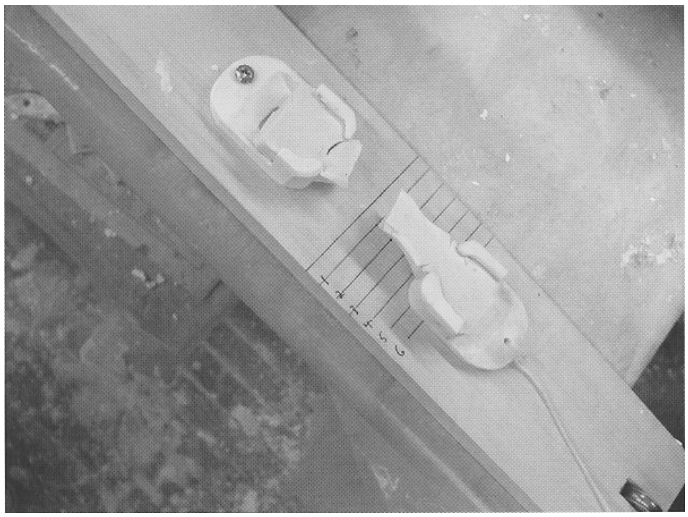
A Little Background

During World War II, the U.S. Navy began using alginate for dental impressions in place of agar which was only available from Japan. Alginate quickly spread to the rest of the dental profession. L(For a detailed history of alginate, see "Alginate Life Casters' Gold" by Ed McCormick, "Art Casting Journal" September 2001) The name of the first artist to recognize alginate as an ideal material for life casting has been lost to history but it is easy to imagine the scene. He or she was probably a dentist who, when removing a cast of some poor victim's incisors to molars, suddenly realized that this alginate stuff just might be able to cast some more interesting parts than teeth!

Life casting had begun.

The biggest problem with using dental alginates to cast any part bigger than a mouth is that they set up too quickly. Eventually, alginate became available that had setting times of 5 to 8 minutes which allowed for more elaborate castings. These were and are essentially dental alginates slowed down. Most of these alginates are still produced by dental firms as line extensions. And so it has gone up until now. ArtMolds may be the only company that manufactures alginates exclusively for life casting.

The problem is that just slowing down the setting time doesn't produce the optimum life casting material. (See "How to Extend the Setting Time of Alginate" by yours truly in the March, 2003 issue of Sculpture Journal.) Along with some other features, the ideal life casting alginate also must be just the right compromise between two of its opposing characteristics, strength (tear resistance) and durometer (hardness/softness). Alginate can be manufactured to be very strong but it will also be very hard. Make it soft and it will also be fragile. If very soft, the alginate will easily tear, particularly with thin structures. On the other hand, a very strong alginate can be so inflexible that it will tear rather than pull free from tight places. One of the more common problems occurs when c



Stretching a sample for strength

casting a face. The impressions of the inside of the ears can tear loose. If the alginate is too hard, it can be difficult to remove the mold from the subject or vise versa. Also, the greater the likelihood of pulling out hair. Life casting is not suppose to also be a bikini wax! Up until now, all alginate shave been compromises. In other words, manufactures have tried to make alginate as strong as possible without being too hard. The better brands have done this very well and there are some excellent alginates available that serious life casters, myself included, have used for years with great results. But ArtMolds's Ed McCormick has a new approach. Ed believes that he has discovered a way to increase strength while maintaining an optimum softness by adding just the right amount of special, proprietary fibers. He claims that in addition the fibers do not in any was impede detail but actually improve the consistency so that the alginate will better stay in place on the subject without running off. Let's see.

Devising a Testing Procedure

When Ed asked me to take a look at his pride and joy and give him my honest opinion, I had to devise a method to determine if his patent pending fibers really do increase the strength. I could have just poured out puddles of several different alginates, let them set up, and pulled them apart to determine relative tear resistance. But that would have been too subjective. I needed a way to actually measure the strength.

The author beginning to test a sample of alginate for strength and elongation. The assistant's hand is positioned to keep the end of the alginate and its cradle from hitting the author in the face when the sample breaks.

The author holding up one of the E FIX body impressions by one end without it tearing. This was impossible with the other brand of alginate.

What I did was sculpt a 5 inch long "dog bone" with a center that is 1/2 inch wide by 1/2 inch thick. I made a mold of this in silicone rubber allowing me to cast exact duplicates in alginate. The hardest part was figuring out a way to grasp the ends without damaging the alginate. My solution was to cast two cradles in urethane that precisely conform to the ends of the alginate specimens. One of the cradles was fastened to a flat board with a pulley at one end. I tied a string to the other cradle and passed the string over the pulley. A hook was tied to the end of the string to attach an empty bucket. (If you are completely lost, see the photograph and I think this will all make sense.)

To test the alginate, all I needed to do was cast an alginate specimen, slip it into the cradles, pour water into the bucket stretching the specimen until fracture, and weigh the bucket to see how much weight was required. To assure consistency, all the samples were mixed at a ratio of 5 ounces of alginate to one pound of water. The waster was 80 degree F. To eliminate bubbles and insure a uniform density, the specimens were put into a pressure chamber and allowed to set up at 50 p.s.i. Testing was done after 20 minutes of cure time. Since I was curious as to how far the specimen would stretch before failure, I marked the board at one centimeter intervals. While I don't have any illusions that my method would meet A. S.T.M. American Standards for Testing Materials, scrutiny, I am confident that it is accurate enough for the purposes of this article.

First Impressions

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When I opened the container, it was immediately obvious that FiberGel E F/X Grade at least looks and feels different.

Any other alginate that I had ever used looked and felt pretty much like flour. Of course, alginates come in different colors but the color is uniform throughout. But not with E F/X. While the basic material is a neutral color, there are obvious specks of red.

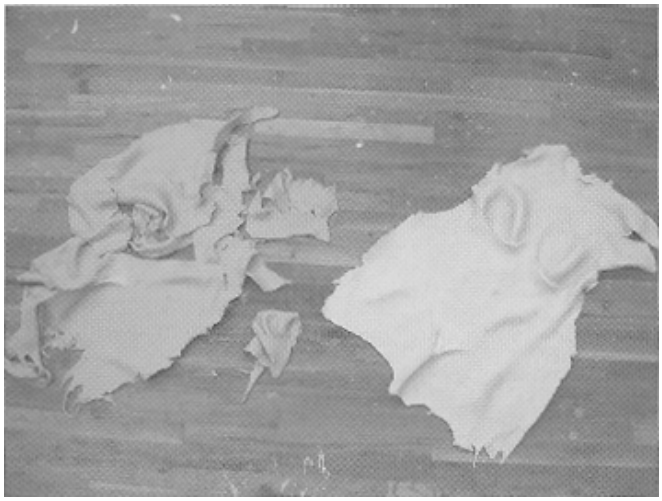
Closer inspection reveals that these red specks are very small pieces of fiber. Rubbing it between your forgers reveals additional colorless fibers.

My first thought was that there is no way this concoction of alginate of fibers would mix into the creamy smoothness that I am used to. But it does. Ed McCormick had also sent me a sample that is exactly the same but without the fibers; it looked and felt like any other alginate. I mixed a small batch of each and cast the palms of my hands. They felt almost the same except that the E F/X had more body. In other words, mixed with the same ratio of water, the E F/X is more thixothropic which means that it tends to stay in place without dipping or running off better than the same mixture without the fibers. When removed from my hands, the detail looked identical. As near as I could tell, Ed's promise of better adhesion without sacrificing details true.

Another characteristic of E F/X is its fragrance with smells to me like citrus. It is pleasant without being overwhelming.

Test Results

I tested both the FiberGel E F/X Grade and the same alginate without the fibers several times to assure consistency and accuracy. Simply states, the secrete fibers increased the tear



The E FIX and control alginate body impressions after removing them from the model and lifting them by one end.

strength 16%. The elongation for both types was the same, over 4 centimeters. Since all I had done was demonstrate that the E F/X is stronger than it would be without the fibers, I hadn't really compared it to any other product. I decided to test another brand which I happened to have on hand. I will only say that this particular brand is one of the most respected and used among serious life casters. I have used it myself and recommended it often. Its tear strength tested at only 61.5% of the E F/X. Its elongation was less than half. In terms of soft, stretchy, yet tear resistant, FiberGel E F/X Grade Alginate is clearly superior.

Out of the Lab, and into the Real World

I decided to determine if E F/X's attributes are of any real advantage. I had one of my assistants place a hand palm down on a flat surface with her fingers slightly apart. I mixed up a few ounces of e F/X and spread it between and over the fingers. After letting it set up, I lifted off the alginate. The thin material between the fingers came out without tearing. Next I tried an even more real world application, casting bodies. I made two impressions of a standing front female torso from the top of the neck to the mid thighs. For each, I mixed 8 pounds of water and 40 ounces of E F/X. In my experience, this amount of material can be mixed using a high speed drill with a j iffy mixer in a minute flat. The E F/X took just slightly longer, about a minute and 15 seconds to achieve a uniformly smooth consistency. I spread on the E F/X, paying special attention to undercuts such as armpits and under breasts. It went on smoothly and stayed in place from 1/8” to 1/4" with very little running. I did not complete the molds, that is, I did not construct supporting mother molds. I was more interested in seeing if I could peel off the alginate ein one piece without tearing it. I could. Even though the alginate weighed 10-1 /2 pounds, I could lift it by one end without its pulling itself apart. Holding it up to a light, the thickness was uniform.

For one of these I used 80 degree F. water and the E F/X set up in 6 minutes on a warm body. For the other I used 90 degrees water and the setting time as 5 minutes.

Pealing an E FIX mold off of a hand without tearing the thin alginate between the fingers.

By way of comparison, I performed the same test using another alginate. I couldn't even peal it off the model without serious tearing. When I attempted to hold it up by one end, it simply tore apart. The difference was remarkable. (Seethe accompanying photographs.)

If alginate isn't blended thoroughly in the manufacturing process, soft spots can occur. The result of this effect will be un-gelled alginate remaining on the model's and a corresponding flaw in the casting. In both of the above tests, the E F/X came off cleanly. Close inspection of the impression confirmed no soft spots. And except for a very few small ones, the surface was bubble free.

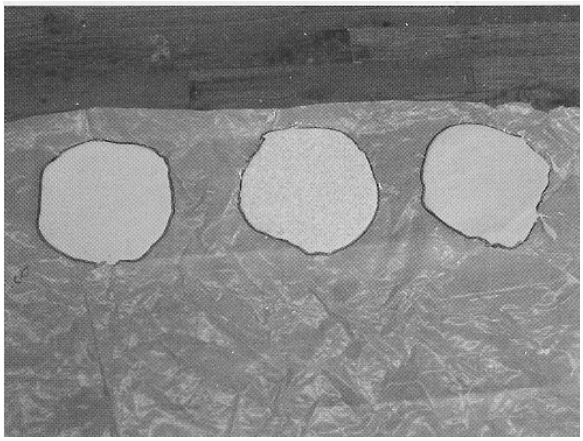
About Mixing Ratios

For years, I mixed alginates too thin. I had the mistaken idea that thinner meant less bubbles. What it really meant was that a lot ran off the subject and was wasted. I finally figured out that it could be considerably thicker than I had been using and still be bubble free at the surface. Most quality alginates require about 5 ounces of alginate to 1 pound of water for the mixture that I prefer. However, the ratio can vary considerably depending on how much alginic acid (the costly ingredient) that a manufacturer uses. Many "bargain" alginates may require more alginate to the pound of water-reducing the bargain.

It seemed to me that during the above tests on the bodies, the mixture was just about right. But for comparison, I mixed three small samples using 4.5, 5, and 5.5 ounces of E F/X per pound of water. While all three were workable, the first was just a little too runny and tended to drip while the last was just a little too thick resulting in a few small surface bubbles. 5 ounces to a pound of water is right on. However, a 4.5 or even a 4.0 mix would work in a container and the 5.5 would be helpful for serious undercuts.

Delayed Shrinkage

Ed McCormick had told me that in his experiments E F/X seemed to retain moisture and delay shrinkage of the mold.



The three `pancakes " of alginate at the beginning of the 26 hour dry out.

This would then allow one to delay casting in the mold without distortion if necessary. I have to admit that I was skeptical of this claim but came up with two test. The first was to mix a sample of E F/X and two other alginates up. I traced around their circumferences and let them dry out for about 26 hours. The second was to cast the same face twice using e F/X and another alginate. These were finished molds including plaster mother molds and were also allowed to dry out for abut 26 hours. (The 26 hours just fit my schedule and had no other significance).

When I examined the "pancakes," it was obvious that all three had shrunk inside their original circumferences and that the E F/X was closest to its original size. Careful measurements determined that the other two had shrunk 8.0% and 6.2% while the E F/X was only 3.5% smaller. In addition, the E F/X was flat while the other two's edges were noticeably curled up. Both of the face molds showed shrinkage but the control sample had a definite split while the E F/X was intact. While I wouldn't recommend that someone wait 26 hours to use a mod, it was obvious that E F/X will delay shrinkage and allow one more time to complete a project.

What's in a Name?

E F/X sounds like a science fiction as in the "e F/X Files" or the "Creature from E F/X" and in fact there is a connection. ArtMolds says that it is "specifically formulated for high-demand, high-production, high-end E F/X (special effects) work." Of course it is also available to the rest of us.

Cost

At this time, the final cost of E F/X has not been set. Because of the added materials and the additional blending required to produce a uniformly consistent distribution of fibers, it will cost a little more that other premium grade alginates. While we all like a bargain, I have always tried to distinguish between the cost of materials and the actual cost of producing the end product. Better materials may reduce the overall cost of production by saving time and or problems or allow for a product that would have otherwise been impossible.

Where to get it

ArtMolds has distributors throughout the U.S. and Canada or can be ordered directly. For details, email them at: info@artmolds.com

Dave Parvin enjoys sharing his experience and expertise and routinely offers workshops. He can be reached at parvinstudio@comcast.net or 303-321-1074.

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