

Plastics For Repairs and Effects by Don Frank

### **Epoxies for repairs and limited special effects.**

Five minute or 20 min epoxies

**Apoxie sculpt** (Available from Aves Studio Wisc.)

**Magic smooth** (available from Matuska supply Iowa)

**Mortar dye powders** for opaque coloring of the piece. (Available from IASCO supply, Minnesota)

### **Terms you need to know about cast able resins-**

Pot life, this is the time it takes from mixing the two components together (at room temperature) until the material gels and goes from a liquid to a solid. Varies from 20 seconds to two hours depending on the product.

Cure time, the amount of time it takes for the resin to cure and become a solid so that it can be handled. On the slower setting plastics this is usually overnight or 24hrs. Complete cure time until the piece can be turned, sanded and finished can be several days after initial cure time.

There are three types of clear plastics that can be used for special effects on woodturnings.

Polyester resin, also called Clear casting resin. It uses a hardner to cause it to cure and the directions will usually say how many drops per ounce of resin to use. The more you use, the faster it gels and cures. The more you use, the more heat that is created. Excessive heat is not your friend. It is often used for pen blanks and smaller items.

Pros- reasonably priced, cures clear, will accept dyes and powdered irridesent powders. Clear casting resin is available from Hobby Lobby or Michaels.

Cons- Very strong fiberglass smell which you will hate in an enclosed building, shop or basement and it is flammable before curing. Pouring larger solid masses (anything thicker than 1") can cause excessive heat, which can cause the material to discolor and crack. Fewer drops of hardner can be used however too little can cause stickiness or incomplete curing. Requires a lot of trial and error and you will not love the smell even when fully cured and you begin to turn the piece. If your desire is to remove insects, mice or unwanted spouses from your house this is the perfect choice.

Epoxies. Most people are familiar with pourable epoxies that are used to make bar top finishes that hold up to hard abuse. Many woodturners use this product as a finish when a very thick very glossy finish is desired. The very well known Moulthrop woodturners use this finish on their gallery woodturnings. The tabletop epoxy finish is not the best choice for solid casting as it can produce excessive heat

when curing. West Supply has a variety of clear epoxies available and some of them may work for casting. Most of their epoxies are designed for clear coating, laminating or mold making. In general you will want to use an epoxy that has a long Pot life. The longer the pot life, (time until it gels) the less heat produced which allows you to do thicker castings. Polymer Composites from California (available on ebay) has a Max 1618 epoxy which is designed for casting bigger volumes. Working time is 50-70 min. Smooth-on plastics also has a good clear epoxy used for casting. EpoxAcast 690 clear.

Pro's- Low odor, non flammable, water thin. Is not overly moisture sensitive. The wood you use should be as dry as possible but minimal moisture will not cause bubble issues. Instructions will tell you to not pour it in layers thicker than ½ but there are some exceptions to that rule.

Con's Most are a 2-1 mixing ratio by volume instead of a 50/50. The price is similar to many clear Urethanes. You will want to allow the product to post cure for several days before turning.

**Urethanes**- Urethanes are the most common clear plastics used for volume casting. Alumilite and Smooth-on are the most common suppliers. What both suppliers refer to as clear is actually a very light amber, or sometimes milky translucent color. The translucent doesn't usually matter if you are planning to add tint, or powders to make something to make it colorful. If you want one to be as transparent as possible stick with the water clear varieties.

Gel times vary from 2 minutes to 2 hours. Smooth-on makes a 200 series which is optically clear if complete transparency is required. If you can get away with a slight amber tint the Smooth-on 327 will work fine on thicker castings at about half the cost. Urethanes are fairly expensive, starting at about \$95. for a two gallon kit. The 200 series is about twice that. The 327 will cost about 40 cents a fluid ounce and the 200 will be about 80 cents a fluid ounce.

Pros- Easy to use, non-flammable, and most are a 50/50 mix by volume. Most are water thin so they get good penetration into the wood.

Con's- All urethanes are moisture sensitive. Make sure the wood you are using is as dry as possible and it's a good idea to put it near a wood burning stove or other heat source to reduce the moisture level as low as possible before you make your pour. They have an odor but not an unpleasant one. The 200 series is considered a professional grade product and more care should be taken to not breath fumes etc. It is an 100A/90B mixture by weight, not volume. A gram scale is necessary.

### **COLORING AND TINTING**

Any kind of iridescent powders can be used to tint urethanes or epoxies to make interesting colored effects. There are also many liquid tints that can be used as well.

## **GETTING THE BUBBLES OUT-**

Regardless of what type of clear resin you use you will want to get the air out so that tiny bubbles are not visible in casting.

### **Pressure pot vs vacuum pot.**

Harbor freight makes a decent inexpensive 2.5 gal pressure pot that will work well for most of our purposes as long as you can fit your project inside the container. Do not exceed 65lbs of pressure. Pressure pots (with 65lbs of pressure) reduce the size of the bubbles by four times. They don't remove the bubbles, just make them small enough that they are not visible.

My vacuum pot is an old pressure pot that that I have adapted with a gauge and ball valve so that I can pull a vacuum . You can mix up your resin and place it into the pot and pull a vacuum and this will pull out the majority of the air entrapped. Then you can pour the resin into the mold. This method has limited use for our purposes. A pressure pot is a better choice.

The commercial product Cactus Juice is used to impregnate porous wood to stabilize it. This method is fine for things the size of pen blanks but not a great choice for larger pieces that you want to turn on the lathe. It will not fill large voids.

Plastic bottles, Tupperware etc make good casting containers as the resin will not stick bad to them. If using PVC pipe to make a mold you will need to put a coat of automotive car wax on the plastic, let dry and buff. Then use a Universal spray release (available from Smooth-On) to prevent sticking.

Tips- Incorporate a wood block on each end of the casting if you will be turning between centers as the plastic is easily damaged otherwise.

A respirator is recommended when mixing the plastic unless you have positive air flow away from you to avoid breathing fumes. A respirator or good quality dust mask is recommended so you are not breathing the fine dust as you turn and sand.

Cast-Tech in Olathe, Ks is the best source for your liquid casting needs. They stock a lot of the products but will order in whatever you want with no freight for local pickups.

(913-782-5944).

Aves studio ([avesstudio.com](http://avesstudio.com)) has apoxie sculpt and other products.

Matuska supply ([matuskataxidermy.com](http://matuskataxidermy.com)) (800-488-3256) also has apoxie sculpt and also Magic smooth in smaller containers.

Iasco supply ([iasco-tesco.com](http://iasco-tesco.com)) 952=920-7393



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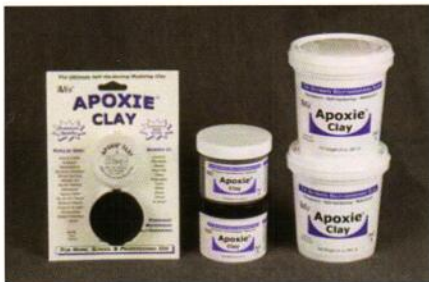
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### APOXIE® CLAY

The Ultimate Self-Hardening Clay!

Apoxie® Clay is a 2-part, self-hardening synthetic clay that combines the features and benefits of sculpting clay with those of epoxies. This product offers enhanced detail properties, plasticity, accuracy and handling features that make this clay very user friendly. Apoxie® Clay offers superior modeling, impressions and detail finishing, with a flat clay-like texture. Working time is 2-3 hours, curing to a hard, waterproof finish in 24 hours. 0% shrinkage and 0% cracking! Adheres to clean surfaces: porcelain, ceramic, vinyl kits, polymers, foam, fiberglass, wood, some plastics, and more! Can be seamlessly feathered before set-up with a paint brush and the use of Aves® Safety Solvent for fine details; use water for smoothing surface areas of your project. After set-up it can be sanded, tapped, drilled, carved, lathed, or otherwise tooled, without chipping, cracking or flaking. Can be painted or stained wet or dry. Simple water clean-up or use Aves® Safety Solvent.

Colors Available:  White  Native

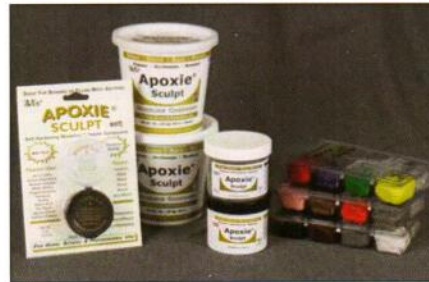
Apoxie® Clay: 1/4 lb., 1 lb., 3 lb., 15 lb.



All Purpose Adhesive!

Apoxie® Paste is an innovative adhesive medium used to permanently fill, bond, seal, customize & fabricate most materials. This all-purpose 2-part paste is safe & easy to use. Batter-like consistency is stir-able, yet thick enough that it tends to stay put; spread thick or thin with a tool or craft stick. When applied thin it is slightly translucent. Tint with pigments to match or create a desired color. Smooths with water to a semi-gloss finish. Working time 1-3 hours; 24 hour full cure; sand & paint if desired. It is waterproof, with 0% shrinkage, & gripping flexibility. Adheres to many plastics, resin, polymers, glass, metals, wood, stone, foam, & more. Simple water clean-up or use Aves® Safety Solvent. Great for arts & crafts, jewelry, stone setting, taxidermy applications & casting with flexible molds. Apply to foam or other materials for a hard surface coat, add texture to both porous & non-porous surfaces.

Apoxie® Paste: 1 fl. oz., 8 fl. oz., 32 fl. oz.  Khaki color



### APOXIE® SCULPT

Economy Plus Performance!

Apoxie® Sculpt offers economy as well as performance. This 2-part product has a putty-like, smooth consistency, and is easy to mix & use. It is safe and waterproof with 0% shrinkage/cracking! Working time is 2-3 hrs. Cures hard in 24 hrs., and has a semi-gloss finish. Adheres to plastic, resin kits, wood, metal, ceramic, glass, polymers, foam, fiberglass, & more! Can be seamlessly feathered before set-up, or sanded, tapped, drilled, carved, lathed, or otherwise tooled after set-up, without chipping, cracking or flaking! Save time & money on finishing jobs by using Apoxie® Sculpt colors. Simple water clean-up or use Aves® Safety Solvent. Endless uses for artists, crafters, restorers, modelers, students, and more! Great for creating 3-D graphics and outdoor projects! Available in 12 colors.



Apoxie® Sculpt: 1/4 lb., 1 lb., 4 lb., 20 lb., 12 Color Sampler Kit (all 12 colors 1/8" lb. each)

### SUPER WHITE

Apoxie® Sculpt Super White offers enhanced detailing properties and more resin compatibility. It has a firm, bright white body, very smooth consistency and a fast set up time. Working time is 1-2 hours. Cures hard in 24 hours and has a semi-gloss finish. Same great adhering properties and finishing features as our traditional Apoxie® Sculpt. Simple water clean-up or use Aves® Safety Solvent.

Super White: 1/4 lb., 1 lb., 4 lb., 20 lb.  Super White



Aves® Safety Solvent is recommended for tooling, smoothing, texturing, and quickly cleaning Aves® Apoxie® & FIXIT® products, and other epoxies, from tools, brushes and surfaces before set-up. Also removes many other sticky substances. This clear liquid is a must have companion for our line of 2-part products. Water clean-up! D.O.T. certified non-hazardous for international and domestic shipping. This is a safe alternative for acetone and other commonly used toxic solvents. It is the least flammable, most effective safety solvent on the market!



Aves® Safety Solvent: 1 fl. oz., 4 fl. oz., 16 fl. oz.



### FIXIT®

WHAT'S IN YOUR TOOL BOX?!

FIXIT® is a 2-part, permanent, universal repair compound used to patch holes and cracks, seal & plug leaks. It has a putty-like consistency, is waterproof, with 0% shrinkage/cracking! Working time is 2-3 hrs., sets rock hard in 24 hrs. FIXIT® works wonders for rebuilding & fabricating parts, and as an industrial adhesive compound. Adheres to wood, porcelain, ceramic, metals, stone, glass, cement, tile, masonry, foam, fiberglass, most plastics & more. Use on tough jobs, auto, outdoor & marine projects. FIXIT® sets up under water and stands up to UV rays, fuels & heat up to 500° F. Can be seamlessly feathered before set-up, & sanded, tapped, drilled, lathed, carved, or otherwise tooled after set-up, without chipping, cracking or flaking! Simple water clean-up or use Aves® Safety Solvent.

Colors Available:  Ceramic White  Black  Aluminum  Bronze

FIXIT®: 1/4 lb., 1 lb., 3 lb., 15 lb.

### FIXIT® SCULPT

Repair and Sculpt on a new, exciting level! FIXIT® Sculpt is great for many uses that require all of the features and benefits of our traditional FIXIT® plus offers exceptional sculpting qualities. It has a firm clay-like feel that resists sagging and drooping; holds detail & impressions. Generous 4 hour working time. Flat matte finish, accepts paints and stains. Great for intricate sculpting work, antler & bone art, more!

FIXIT® Sculpt: 1/4 lb., 1 lb., 3 lb., 15 lb.  Canvas



Industrial Quality Adhesive!

FIXIT® Paste is a 2-part paste used to permanently repair, bond, cast & seal most anything. Self-leveling batter-like consistency is stir-able, can be spread thick or thin for durable surface coat. Tint with pigments to create or match desired color. Safe alternative to fiberglass & other casting resins, works great with flexible molds. Cures to a rock hard, semi-gloss finish that can be sanded, drilled, machined or painted. Outdoor & marine applications; stands up to UV rays; is impervious to water, fuels & chemicals. Patch holes & cracks, seal leaks (non-conductive, safe to use with potable water). Working time of 1-3 hrs. Full cure 24 hrs. FIXIT® Paste is non-hazardous, waterproof, with 0% shrinkage. Adheres to metals, wood, most plastics, PVC, fiberglass, stone, ceramic & more. Tackle your toughest repair jobs!

FIXIT® Paste: 1 fl. oz., 8 fl. oz., 32 fl. oz.  White