

TECHNICAL SOURCE GUIDE

POLYMER CLAYS

By Julie Ann James, University of Minnesota

Polymer clay is a useful, relatively safe and friendly product that has and will continue to have a home in theatre production. Its appropriateness is limited only by the size and durability requirements of the finished product. The characteristics of polymer clays suggest a plethora of theatrical uses; military insignia and jewelry items are obvious possibilities. Polymer clay is also heavily used in bead-making, particularly in mimicking the look of Venetian glass millefiori beads.

Polymer clays are actually a form of polyvinyl chloride (PVC) with added plastisizers which make the clay workable. The process for hardening these Clays is called PVC fusion, where the polymer molecules are arranged into porous grains and then saturated with plasticizers to keep the clay malleable. As these grains are heated, they swell into a gel and begin to fuse with each other. When the temperature rises even further, the fused PVC forms a hard, permanent plastic. Temperatures for PVC fusion vary from 250 to 300 degrees Fahrenheit, a range that is available with most ovens.

Important safety issues must be considered during this hardening process. The room must be well-ventilated, and the user should not breathe the fumes produced while the clay is baking. Far more dangerous fumes are produced if the product is burned, which generally occurs when the oven temperature is too high. Hardening times and required temperatures vary from brand to brand, so one must read and follow all package directions. The clay should also be baked on a nonmetallic surface such as oven-proof glass or slate. A microwave should never be used.

Although it is inert and considered safe after hardening, it should not be used as a food container. In addition, food should not be eaten in the work area since some plasticizers inevitably leach out. It is considered non-toxic for casual use, but heavy users would be wise to wear rubber gloves during the kneading process. Lastly, sanding or drilling requires the use of eye protection and a particle or dust mask. .

All brands of polymer clay have common characteristics that make them ideal for many theatrical applications. It is easy to work with, it needs few tools, and it does not require special equipment or extensive technical training other than reading the instructions. It can be molded with the hands or pressed into molds, and the material itself makes an excellent mold. All brands can be safely used together. Colors can be intermixed to suggest marbling or to create new colors, as colors remain essentially unaltered when baked. Polymer clay does not shrink at all, and there is negligible warping during baking. A standard oven or toaster oven can be used, and even boiling the product is acceptable. Pieces of glass, beads, feathers, jewelry findings or anything else that will stand the heat can be attached and baked on. The hardened product is durable, lightweight, waterproof, and washable, and it can also be

TECHNICAL SOURCE GUIDE

sanded drilled, and painted. Any unused portion can be safely stored in a plastic bag at room temperature; however, it should be used within one year from purchase.

Three polymer clays are available in the United States for artists and crafts people, two of which are made in Germany. The first, called Fimo, is manufactured by Eberhard Faber. This product is very well known and readily available through catalogs, local art supply stores, and hobby shops. It is available in 45 colors including fluorescent and "night glow", a glow-in-the-dark clay. Fimo can be purchased in 2.25 oz. and 13 oz. blocks. While it is quite stiff when first taken out of the package and requires a lot of kneading before it is workable, it does have a high tensile strength when baked. Fimo also holds detail well because of its hard consistency. Eberhard Faber's newest product is called Puppen Fimo. It is intended for modeling dolls and is available in a 17.5 oz. size. This company also makes a wide variety of related products such as Mix Quick (a neutral mixing compound to make kneading easier), Fimo lacquer to add a gloss or matte finish, metallic powders in various colors to gild pieces, and helpful modeling books.

The second German polymer clay product is called Cernit. It is made by the T + F GmbH Company. Cernit is available in 37 colors which are known for their particulate translucency. Because of this and its high tensile strength, it is often used in doll-making. Cernit does not appear to be available locally but can be purchased through wholesalers. All colors are packaged in 65 gm (2.3 oz.) blocks, while a few basic colors come in 250 gm (8.8 oz.) and 500 gm (1 lb. 2 oz.) blocks.

The Polyform Company of Schiller Park, Illinois is the only known American manufacturer of polymer clays. Sculpey is their basic white product and has been in use for many years, particularly in schools. Super Sculpey bakes to a ceramic-like hardness and comes only in a Caucasian "flesh tone". More recently Polyform developed Sculpey III which is similar to the original Sculpey but comes in 30 colors, including metallic. Sculpey III is the softest of all the brands when fresh out of the package. Although it is easier to work with initially, it also has a lower tensile strength and does not hold fine detail well. Like Fimo, Sculpey III can easily be found in art supply stores and hobby shops. None of the contacted wholesalers carried it, however. Sculpey III is packaged in 2 oz. blocks and also is sold in 1 lb boxes. Like Eberhard Faber, Polyform also carries a line of related products.

These clays vary in price from place to place, but on the average, Fimo is sold for approximately \$1.20 per oz. in local stores and about \$.50 per oz. or less through wholesalers. Sculpey III is approximately \$.60 per oz. locally. Cernit is the most expensive at approximately \$.90 per oz. wholesale.

Thank you for taking time to read this "classic" Technical Source Guide! Because it has been published a relatively long time ago, addresses (physical & web) and any phone numbers, might not be current!

Technical Source Guide #20 – POLYMER CLAYS

- A project of the USITT Technical Production Commission

Disclaimer: the publisher does not assume any liabilities resulting from the use of the information contained in this document. Neither Sightlines nor USITT endorses any products presented.