

Speciality Mold Making & Casting Materials

This section describes a few speciality mold making and casting materials offered by Polytek. These materials can be used in conjunction with Polytek's traditional mold rubber and casting plastic products, enabling users to tackle virtually any mold making and casting challenge.

Latex - Tough, one-part brushable, castable rubbers

Wax - Castable, carvable version; skin-safe version acceptable for body molding

Hydrogel - Safe for skin contact - for body molds & life casting

Poly Latex 60

DESCRIPTION: Poly Latex 60 is a one-part, brush-on liquid that, after multiple coats, builds up to form a tough rubber blanket mold. Molds made with Poly Latex 60 are often used for casting plaster, concrete and limited casting with some resins.

Poly Latex 60 has better tear strength than synthetic rubbers and is sometimes preferred for molds that are peeled off the casting like a sock. However, two-part, synthetic rubbers like Polygel® products can be brushed on to final thickness in an afternoon and should be considered as a latex alternative.

MODEL PREPARATION: The model should be free of oil, grease and dirt. Wood, oil-based clay, stone and glazed ceramics generally do not require any sealer. Plaster, unglazed ceramics, copper containing metals, water clay and cement should be sealed with shellac. Models made of other materials should be patch tested by applying a coat or two of latex to a small area. If the latex turns dark or sticks after drying, a sealer should be applied.

Models with sharp edges or points may yield a better mold if the points are dulled slightly by sanding prior to sealing.

Firmly mount the model on a suitable base board (i.e., plywood or a sink cutout available from kitchen counter shops). Drill a hole through the base board to allow air to escape from within the model so that trapped air does not cause defects in the mold.

APPLYING & CURING: Brush a thin coat of latex on model using care not to puddle the latex. A gentle stream of air may help to blow latex into the finest detail and break any bubbles. Each coat should dry in 4 to 16 hours if placed in a warm, ventilated room. Drying time depends on temperature and humidity. Warm, dry air is necessary for fast drying. When dry, the latex loses its milky appearance, and becomes slightly transparent and amber in color. The next coat should be applied as soon as the first coat is dry. From 6 to 30 coats may be needed depending on the desired mold thickness. Molds are typically 1/16- to 1/8-inch thick.

For large, flat models, apply latex in a checkerboard pattern, alternating squares between coats. Since there is some shrinkage on drying, the patchwork method reduces stress and warping of the latex as it dries.

Latex can be thickened with ground cork, sawdust or Cab-O-Sil® in order to fill undercuts. Thickeners must be completely wet out with latex and applied to the outside surface of the mold. The thickened latex must be allowed to dry completely as wet spots trapped in the latex can cause delamination of the mold.

To reinforce latex molds, imbed muslin, burlap or polyester fabric in the rubber. The fabric should be laid into a wet coat of latex and then saturated with latex throughout. Allow the saturated fabric to

FEATURES

- Brush-on liquid
- Great for casting highly ornamental plaster and concrete
- One part, no mixing or weighing needed
- Tougher than any other mold rubber

dry completely before applying more latex.

The latex must be thoroughly dry and heat cured prior to removing from the model. Heating in a warm oven at 110-150°F for 6 to 8 hours ensures a complete cure. If heat curing is not possible, place the mold in a warm area for a week to help to strengthen the rubber.

Clean up wet latex with soap and water. Dried latex can be softened with waterless hand cleaner and washed away.

USING THE MOLD: Avoid exposing the mold to oils, grease or solvents. Molds can be washed with soap and water. Before casting plaster or cement, wet the mold with a 1% solution of detergent in water to aid releasing air bubbles from the mold surface. Usually, no other release is necessary. For resin casting, a release agent such as Pol-Ease® 2300 or PVA is needed. Most resins shorten the life of a latex mold -- Polygel® or Poly-Sil® rubber molds may last longer.

SAFETY: Before use, read product label and Material Safety Data Sheet. **WARNING!** Poly Latex products contain ammonia and causes eye and skin irritation. Avoid skin and eye contact. Use with adequate ventilation. In case of contact, flush eyes with plenty of water for 15 minutes and seek medical attention. Remove from skin and clothing with soap and water.

STORAGE LIFE: At least 3 months in unopened containers stored at room temperature (50-70°F). Opened containers should be tightly resealed. As latex ages beyond 3 months, it will not cure to as supple a rubber and shrinkage on drying may increase and toughness of the mold will decrease. Exposure to temperatures below 40°F and above 80°F may damage latex, causing irreversible coagulation. **DO NOT ALLOW TO FREEZE.**

PACKAGING	
Unit Weight (lb)	Container
2.0	1 qt
8.0	1 gal
40	5 gal
400 lb	55 gal

Poly Latex False Face Compound

DESCRIPTION: Poly Latex False Face Compound is a one-part pourable liquid that, when poured into a dry, unsealed gypsum mold, cures to a high-strength, flexible casting rubber. False Face was formulated to produce flexible hollow parts for uses such as novelty masks, flexible sculpture and animatronic applications.

MODEL PREPARATION: To cure properly, this product must be cast into dry, unsealed, porous plaster molds. The user must determine the suitability of other porous mold materials.

MIXING AND CURING: Shake or stir Latex False Face before use. Pour into a prepared gypsum mold. Tilting or lightly vibrating the mold may help eliminate bubbles if the mold contains complex undercuts or deep details. For a thin skin, pour the excess latex back into the container immediately. For a thicker skin, allow the latex to stay in the mold longer before pouring off excess. A standing time of 15 minutes yields a 3/32-inch thickness in a dry No. 1 Pottery Plaster mold. Denser plasters are not as absorbent and thicknesses build slower. Allow False Face to dry in the mold for 24 hours at room temperature. Elevated tempera-

FEATURES

- Easy one-part rubber—no mixing or weighing
- Tougher than any other mold rubber
- Good reproduction of fine detail
- Forms hollow castings without roto-molding

tures accelerate drying time.

Clean up wet latex with soap and water. Dried latex can be softened with waterless hand cleaner and washed away.

USING THE CASTING: Lightly dust the inside of the casting with talc in order to prevent the dry rubber from sticking to itself. Avoid exposing the casting to oils, greases or solvents. Castings should be stored out of direct sunlight.

SAFETY & STORAGE: Same as Poly Latex 60 (see p. 57).



Latex False Face molds can be made by dipping a dry, porous plaster model into False Face. The longer the model is submerged, the thicker the mold. This technique is only suitable for models with a shape that won't trap air when placed upside down in the False Face liquid.

PACKAGING	
Unit Weight	Container
2.0	1 qt
8.0	1 gal
40	5 gal

Poly Wax 15

DESCRIPTION: Poly Wax 15 is a white, hard, low shrinkage, mineral-filled wax, which can be cast and carved. When cast, it replicates the mold surface in detail and finish. Tool cuts are smooth and lustrous. Dull surfaces can be hand polished with a soft cloth to a satin luster.

MELTING AND CASTING: Poly Wax 15 softens below 130°F and is quite fluid at 160°F. Viscosity decreases rapidly as temperature is increased. At 200°F, components of the wax separate slightly. Mix the melted wax thoroughly before pouring. Complete mixing is quick and easy to determine visually -- mixed liquid wax is uniformly colored with no streaks. Use a non-porous, heat resistant stirrer such as a metal spatula. Pour temperatures are typically 210°F-280°F; however, the ideal temperature is dependent on the mold size, shape and material. Poly Wax 15 holds temperature for a long time, so large or multiple molds can be filled in a single pour. When slush molding, excessively high temperatures will cause remelting of layers already laid down and signifi-

FEATURES

- Ideal for prototypes
- Cast carving blanks from rubber molds of rough originals
- Suitable for master models
- Smooth and lustrous surfaces

cantly prolong the procedure. Casting temperatures that are too low will result in surface bubbles and “knit” marks because the wax solidifies too rapidly on the mold surface.

Poly Wax 15 can be poured in Poly 74 Series, Poly-Fast 72-40, Poly-Sil®, Polygel® or Hydrogel® molds. Latex will be softened by continual pours of Poly Wax 15. Most heat resistant resins and metal molds are also suitable; however, a small trial casting is always recommended to be sure castings release satisfactorily and do not damage the mold material.

SAFETY: Before use, read product labels and Material Safety Safety Sheets. Hot wax can cause severe burns and ignites easily. Avoid skin contact. Do not heat with an open flame. Do not heat above 280°F since vapors can ignite.

STORAGE LIFE: At least 12 months from date of shipment.

PHYSICAL PROPERTIES	
Softening point	126°F
Use temperature	210 - 280°F
Viscosity	@ 100°C (212°F) 116 cP
Density (in ³ /lb)	@ 25°C (77°F) 19.5
	@ 100°C (212°F) 21.6

PACKAGING
Poly Wax 15 is available in 5-lb blocks

Poly Skin-Wax

DESCRIPTION: Poly Skin-Wax is a liquid at temperatures as low as 125°F and it is somewhat elastic after solidifying. It can be applied to models using dip or brush-on techniques. Poly Skin-Wax has been formulated with non-toxic materials and is safe for skin contact provided temperature is carefully controlled.

MODEL PREPARATION: When making a mold of a body part, coat skin and hair with baby oil before applying Skin-Wax. Molds can only be made of body parts that are covered with short and light hair -- do NOT attempt to make molds from hairy areas. For most other non-porous models, Poly Skin-Wax is self releasing and, therefore, no release agent is needed. Make a small test mold on a surface identical to the model to determine that release properties and hardening of Skin-Wax is suitable.

PROCEDURE: Use a therapeutic paraffin bath, available from medical supply stores, to melt Poly Skin-Wax. A crock pot can be used to melt Skin-Wax; however, extreme caution must be exercised to ensure that the wax is not overheated. To melt Poly Skin-Wax, heat to 160-180°F. *Skin-Wax must be cooled to 125-135°F before contact with skin!* Even this temperature may cause discomfort in some individuals. Do not use Skin-Wax on sensitive areas such as the face. The wax must be just hot enough to produce good results; a few degrees hotter can cause considerable discomfort. Test judiciously on small areas.

Stir Skin-Wax often during melting and use since temperature variations in an unstirred bath can result in solidified wax in one area of the bath while another area heats enough to cause burns. Monitor temperature in several places in the bath (i.e., near walls, center and at several depths). Use an accurate thermometer.

Apply Skin-Wax by dipping the model, brushing on or slowly pouring over the model surface. For rapid cooling, immerse the wax-coated model in cool water between coats. Skin-Wax can be reinforced by laying fabric such as cheese cloth onto the previous coat and then applying wax to saturate the fabric.

Although some flexibility remains in Poly Skin-Wax at room temperature, if flexibility is needed to remove the model, it is best to remove it as soon as the wax cools into the elastic (temporarily deformable) state. For model shapes that do not allow removal with the mold intact, the mold may be carefully cut and later rejoined using a warm metal spatula or by "welding" with molten wax. Small air vents punctured in the mold using a pin or wire may help release the mold from the model; for example, in casting a hand, pinholes at the end of each finger facilitate removal of

PHYSICAL PROPERTIES

Softening Temperature		125°F
Use Temperature		125-180°F
Viscosity @ 180°F		190 cP
Specific Volume (in ³ /lb)	@ 77°F	31
	@ 180°F	34

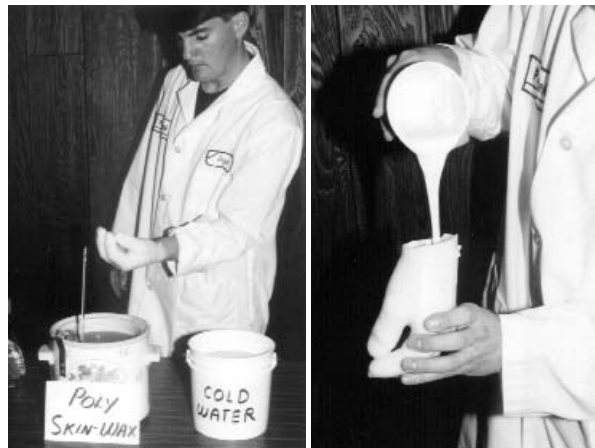
FEATURES

- Safe for skin contact
- One-part mold making compound
- No mixing -- simply melt and use
- Fast -- make a mold in 5 to 10 minutes
- Easily repaired with a dab of warm wax
- Flexible when warm
- Self releasing from most surfaces
- Reusable

the hand. Holes can be sealed later with a dab of molten wax.

SAFETY: Before use, read product labels and Material Safety Safety Sheets. Follow safety precautions and directions. Do not heat with open flame. Do not heat above 280°F since vapors can ignite. Use with adequate ventilation. Do not use in the presence of sparks or open flame. Exercise extreme caution when applying Poly Skin-Wax to the skin. While Poly Skin-Wax is safe for skin contact, it is not recommended that repeated castings be made over a short period as the hot wax tends to remove skin oils and can cause irritation. For skin applications, avoid reusing wax that may have absorbed irritating substances from casting materials.

STORAGE LIFE: At least 12 months from date of shipment.



The hand is dipped into melted Poly Skin-Wax (125°F) then into cold water to harden the wax. Over the next few minutes the process is repeated 2 or 3 times to buildup mold thickness. After the wax is hardened, the mold is slipped off the hand and is ready for casting. Plaster, cement, rubber or plastic can be poured into the hand mold. Be careful not to use a casting material that generates significant heat upon cure. The wax is removed from the casting and can be melted for reuse. That casting is detailed -- fingerprints and all!

Hydrogel® N Mold Compound

DESCRIPTION: Hydrogel® N is a dry, white powder that when mixed with water at a 3 parts water to 1 part Hydrogel N by weight ratio (approximately 1 water to 1¼ Hydrogel N by volume) yields a creamy mix with a 5-minute working time. Working time may be extended using the optional liquid retarder described below. Demolding can be done, with care, 2 to 3 minutes after mix can no longer be worked.

MODEL PREPARATION: Hydrogel N can be poured on most surfaces with minimal preparation, but a small test cure should be made prior to use to be sure Hydrogel N releases cleanly and does not damage water sensitive surfaces. A thin coat of petroleum jelly or Pol-Ease® 2300 release agent will seal most questionable surfaces adequately.

MIXING AND CURING: Weigh or measure proper amounts of Hydrogel N powder and room temperature water. Mix together rapidly, but avoid whipping in air. A turbo mixer on a variable speed drill is recommended. Thicken with more powder, thin with more water. Apply to surface with a flowing motion, pushing air ahead of material. Optional liquid retarder may be premixed with water to extend working time.

Hydrogel N bonds to itself if the previous mix is not completely gelled. Thus, a large mold requiring more than one mix should be made by mixing a series of mixes within 5 minutes of one another. Wiping a saturated solution of water and baking soda (sodium bicarbonate) on gelled Hydrogel N will aid bonding of a fresh mix to gelled material. Food color added to the bonding solution aids knowing where it has been applied. As soon as Hydrogel N is firm, mix and apply a mother mold of plaster. When plaster shell is set, remove the Hydrogel N mold and for best dimensional stability, immediately make a positive casting.

Hydrogel N Retarder can be added to the water before mixing it with Hydrogel in order to slow the cure. The table below shows the impact of Retarder addition on cure time. [Note: If Hydrogel N Retarder freezes, warm the container under running water and shake until a clear liquid results.]

- FEATURES**
- Non-toxic-- Safe for body casts
 - Easy to use: just add water and mix
 - Good reproduction of fine detail
 - Early strength for fast demold
 - Variable working time
 - Low cost



Hands up and on the table! With the use of Hydrogel®N, these children each made a plaster cast of their own hand at a Vacation Bible School craft session. Molds for 35 hands were made in less than 2 hours!

USING THE MOLD: Plaster or waxes below 212°F may be poured in Hydrogel N molds. Castings should be made in freshest possible molds for best results. Hydrogel N molds will shrink as they dry. Molds may be kept useable in plastic bags or sealed containers for up to a few days. Molds should then be discarded

SAFETY: Before use, read product label and Material Safety Data Sheet. Follow safety precautions and directions. Handle Hydrogel N carefully to avoid dust generation. Wear a dust mask. Avoid eye contact. Hydrogel N is not for human consumption or use against mucous membranes. Keep skin contact as brief as possible. Prior to placing Hydrogel N on hair, hair should be slicked down with petroleum jelly or cholesterol hair conditioning cream.

STORAGE LIFE: At least six months in unopened containers stored at room temperature (60-90°F).

LIQUID RETARDER (OPTIONAL)	
% Retarder in Water	Approximate Working Time
0	5 min
3	7 min
6	8 min
9	10 min

PACKAGING		
Product	Unit Weight	Container
Hydrogel® N	0.5 lb	1 qt
	2.5 lb	1 gal
	12.5 lb	5 gal
Retarder Solution	2.0 lb	1 qt



Hiram Ball, of Ball Consulting Ltd., demonstrates making a live-body mold using Hydrogel® N. The safe-for-skin-contact alginate yields excellent mold impressions if wax or plaster is cast right after demolding.

Speciality Materials