

The clear choice: One-piece PETG photopolymer signs

Flexible PETG trumps brittle phenolic materials

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Over the past few years, there has been much advancement in photopolymer signage materials as it relates to the variety of base substrates that are now available to designers and facility managers.

Photopolymer is a photo-sensitive synthetic compound that hardens when exposed to ultraviolet light. The number of applications for photopolymer spans a multitude of industries ranging from printing to rubber stamps to signage.

It wasn't until the passing of the Americans with Disabilities Act in 1992 that photopolymer rose to prominence in the sign industry. The new ADA regulations had a major impact on tactile signage, requiring all public facilities to meet specific codes and regulations. These changes were implemented for the visually impaired and affected issues such as contrast characters, sign placement, character spacing and the placement of Braille raised to 1/32" on top the base material.

For tactile signage, the unique imaging characteristics of photopolymer make it the choice of fabricators as well as designers. Our specialized product line allows designers unlimited flexibility and provides fabricators with the raw

material needed to meet all ADA regulations.

Move over phenolic ... Hello, PETG!

In the past, architects and designers specifying signage had basically one choice of material for tamper-proof one-piece signs: Phenolic.

Phenolic-based material is a ground paper board product that has acrylic mixed with the ground paper board to create a rigid surface. This base material is opaque and is typically brown in color.

If there is any advantage of phenolic materials it's that the material is slightly less expensive than clear PETG-based photopolymer. In the past, phenolic material was considered by most to be the material used for commodity signs. On the down side, phenolic has a high moisture absorption ratio, which can lead to warping and separation of the sign panel if placed in a more-harsh environment. It is important to ensure a very good paint layer when using phenolic material, as this will prevent moisture from making its way into the base material. If the phenolic material does come in contact with moisture, it will expand and possibly crack the paint and create separation or delaminating of the photopolymer

layer from the phenolic base. In addition, the brown color makes it somewhat difficult to color match when top coating, and the opaque nature of the material does not allow for subsurface painting, digital printing or extrusion of elements into the core of the material.

While both phenolic and PETG have a photopolymer layer extruded to a base substrate, the similarities end there. When the process of extruding photopolymer to a clear PETG substrate came along, this new material allowed a great deal of creative options due the material's clear nature. With this choice, you can subsurface paint the panel; digitally print on the back of the panel or use it in a frame system that allows you to place a printed insert behind the panel.

The clear upside of this material is that PETG is not brittle, it is heat-formable and can contain up to 40% post-consumer recycled content. PETG based photopolymer materials also beat phenolic due to its low-moisture absorption ratio and by

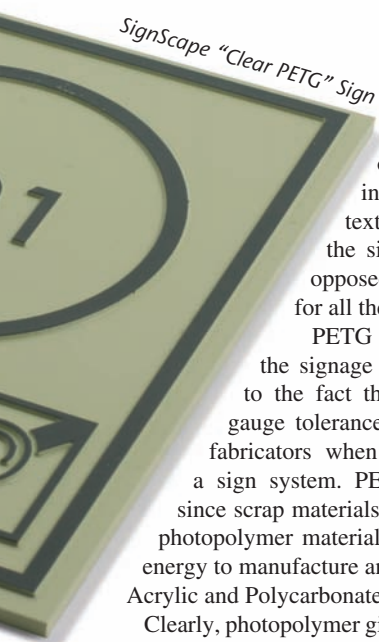


HOW DO THEY MAKE THAT?



SignScape "Clear PETG"
Window Sign

"From a design perspective, photopolymer PETG gives you benefits no other material can approach today – a tamper-proof one-piece sign material that won't warp or separate."



allowing designers to realize creativity never before allowed. The economies realized in the manufacturing of PETG signage offset any cost advantages of using other materials. PETG based solutions come in wood grains, organic materials, fabric, textures and visibly clear patterns, which allows the signage to be part of the interior design; as opposed to an element that “stands out in the crowd” for all the wrong reasons.

PETG in general has become more utilized in the signage industry, replacing Acrylic as a staple due to the fact that extrusion lines can more easily control gauge tolerances, which is a significant advantage to sign fabricators when trying to match different components in a sign system. PETG also realizes advantages over Acrylic since scrap materials can be used in the recycled content of clear photopolymer materials. PETG is a thermal plastic that takes less energy to manufacture and recycle, compared to rigid plastics such as Acrylic and Polycarbonate.

Clearly, photopolymer gives signage designers tremendous flexibility. If you can picture it, it can be a sign.

How Photopolymer sign material is manufactured and processed

Photopolymer sign material is manufactured by extruding a photopolymer layer that is .032 thick (ADA guidelines mandate a raised character height of 1/32") to a variety of base substrates. Once the extrusion of the polymer is made to the base substrate, you now have an integral material that has a photo-sensitive layer that is ready to be processed. There are 4 basic steps in the manufacturing process:

▶ *Step 1. Expose the photopolymer material using a film negative under vacuum.*

This exposure process will harden the polymer that comes in contact with the UV light through the clear areas of a film negative. The polymer that has been protected by the opaque areas of the film will remain soft. The light that is used in the process is low voltage UV bulbs.

▶ *Step 2. Wash away the polymer that is not hardened.*

In this step a sign panel that has been exposed is placed in a wash out tank inside the photopolymer processor. There are no chemicals used in this process – only tap water. The affluent is completely biodegradable and poses no harm to the environment. Through an orbiting motion, brushes carefully wash away the polymer that was not hardened in the previous step. After a 5 minute wash out, the sign panel is ready to go to the next step, which is drying.

▶ *Step 3. Evaporate the moisture from the sign panel.*

In this step, you place the sign panel that has now been exposed and washed out into a dryer drawer inside the photopolymer unit. This “drying” is done at very low temperature for 10 minutes and is intended to rid the sign panel of any excessive moisture prior to the final step of post exposing.

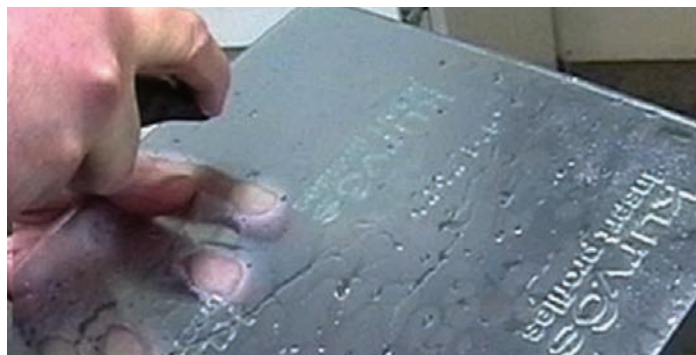
▶ *Step 4. Post Exposure*

In this final step, the sign panel is exposed for 5 minutes to further harden the photopolymer.

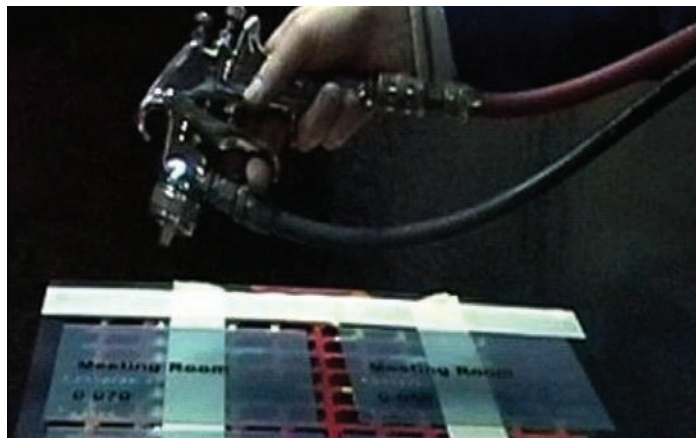
Once this process is complete, the sign panel is ready to fabricate.

Decoration and fabrication of the completed sign.

With PETG based photopolymer solutions, there are several options.



Step 2




Decoration and fabrication

You can surface or sub-surface paint the material since the base material is clear. Many fabricators digitally print patterns and images sub-surface on the clear photopolymer material; customizing the panels to allow for branding and assisting in vandalism deterrence. Once the panel is painted and tipped, it can be placed in a sign frame or simply installed.

With phenolic based photopolymer, the decorating options are limited to surface painting and tipping of the tactile areas, since the material is opaque.

PETG based photopolymer solutions also allow the material manufacturer to extrude elements such as organic material (leaves, branches, grasses, bamboo, wood grains) directly into the base of the material. The fabricator simply needs to “process” the material as mentioned above and you have a finished sign ready for mounting hardware, stand-off’s etc.

PETG photopolymer: the clear choice

From a design perspective, photopolymer gives you benefits no other material can approach today – a tamper-proof one-piece sign material that allows you to have photopolymer on the same base materials that are used in the facilities and institutions that are being designed and constructed today. Photopolymer is environmentally friendly, uses low energy to be produced in a base and finished state, and can contribute toward LEED credits. 

Nova Polymers is the world’s largest manufacturer of photopolymer signage materials.

Dave Miller is Director of Business Development for Nova Polymers. Dave works with architectural design firms and fabrication facilities across the US and Canada to educate designers, specifiers and fabricators about the advantages of photopolymer as it relates to tactile signage.

For more information about InPro SignScope photopolymer signage products, visit inprocorp.com/photopolymer or call 877-780-0034.