THE LIFE EXPECTANCY OF "PLATES"

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One of the most difficult questions to answer in our industry is, "How long should my plate last?" Or, in other words, "How many meters should I expect to get out of my photopolymer plates?" Considering the number of factors that must be taken into consideration, certainly anyone faced with this question should hesitate at least momentarily before answering.

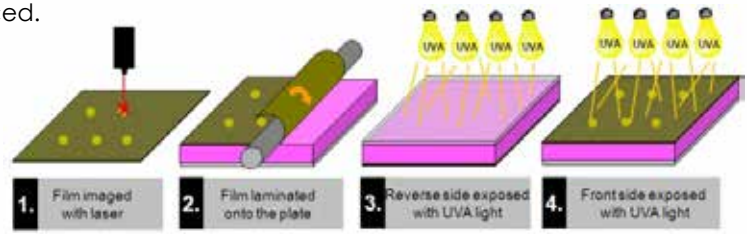
There are a number of people who have an effect on the life of a photopolymer plate:

- The raw material handlers are charged with controlling the both the way material is stacked and the atmosphere in which the material resides prior to its delivery to the plate room.
- Actions taken by the platemaker can affect image quality, plate thickness and relief, along with tackiness and final durometer. All of these aspects can affect the life and longevity of the photopolymer plate.
- The mounter selects the mounting tape, which could have very little compressibility, or maximum compressibility and resilience for screens and process work.
- The skilled press operator determines the ink setting and impression, while the press helper can hold the responsibility of controlling the type of solvent added to maintain viscosity.
- Prepatory personnel may be in charge of cleaning, removal, and filing of the photopolymer plates once the order has been produced.

RAW MATERIAL HANDLING

If plates are being made inhouse, it is very likely that Shipping and Receiving personnel will be the first individuals who can have impact on the life of the finished plate. When the raw sheet material is received, it is important that we consider this product as a semi solid, or being in a Jell O like state. Therefore containers or boxes of raw sheet material should be transported and stored flat and never on end. Raw plate material stored on end will begin to feel the effects of gravity, and the polymer will naturally want to flow downward. The results are sheets that become fused together on the edge facing downward and can also have an effect on the uniformity of the sheet thickness.

When storing the raw material, the area temperature may range from 40° to 100°F (4° to 38°C). When storing these boxes, only those of the same size should be stacked upon one another. Putting a smaller box on top of a larger box could compress the lower box and compromise the quality and uniformity of the material in the lower box. Stacking a larger box on top of a smaller container leaves the edges of the material unsupported and could result in the release of the protective cover sheet(s).

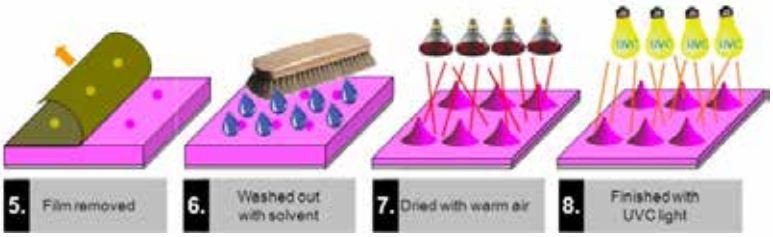


While UV light is the source of polymerization of the material, it can also pre expose raw material or damage finished plates. If the temperature of the platemaking rooms differs greatly from the raw material storage area, the raw material should be adapted prior to the manufacturing of the plate. Once the platemaker trims the raw material to the desired size, the remaining material to be used later should immediately go back into the box or drawer that assures it is protected from UV light and ozone. Other than handling the material with great care when going from one stage of the platemaking process to the next, the plate maker's ability to affect plate life is primarily through their optimization, testing, and verification of the exposure, processing, drying, and finishing processes.

Through the use of a back exposure test, the platemaker determines the time required to achieve proper plate relief. Excess plate relief results in image areas lacking support and premature wear, especially in screen and process areas. The main exposure test is used by the platemaker to ensure that the image is well supported and adequately anchored to the floor, while holding areas requiring a minimum dot and not filling in reverses. Both over and under exposed plates will most certainly lead to a plate lacking longevity.

The processing test is used to determine the minimal amount of time required to remove the un polymerized material down to the floor. This process is true of solvent, thermal, and water processes. Failure to remove all of this unwanted material will affect plate relief, and sometimes affect the uniformity of the plate floor. If the plate was not completely dry before going into post exposure and light finishing, solvents could be locked into the plate surface and affect finished plate thickness. Uneven plate thickness results in the press operator increasing impression to the lowest point on the plate to achieve ink transfer. This over impression then results in pre mature plate wear.

Finally, the platemaker determines the minimum time required to post expose (UVA) and detack, or light finish (UVC). Post exposure ensures that all material on the plate is completely exposed, while the exposure to UVC is to make sure that the tackiness is removed from the plate. Both processes affect



durometer (hardness) of the plate along with the surface tension of the face. Hardness and surface tension both affect the ink releasing characteristics of the plate. When the plate is out of spec, then the press operator is left to try to compensate through non standard ink and impression settings. It is at this point that the plate is ready to be trimmed to its finished dimensions. The trimming of the photopolymer plate can be performed either by the platemaker of the plate mounter.

PLATE TRIMMING

The key to minimizing plate damage during the trimming process is to use a cutting device that cuts smoothly and in a fluid motion. Always be sure that the bevel faces away from the plate face. In other words, the mylar layer should extend further than the polymer portion of the plate. Cutting this angle reversed will leave the layer of polymer unsupported by the dimensionally stable layer of the mylar and can lead to plate tear upon demounting, plate lift during the press run and even print defects if this is an area that should support the plate face.

PLATE MOUNTING

" In the past, mounters and press operators alike have used release sprays in screened areas of photopolymer plates in hopes of minimizing dirty print. While some people do find this beneficial, it is important to remember that the sprays used are temporarily changing the surface energy of the plate face and therefore could adversely affect ink release. " Stickyback, or mounting tape selection also has an impact on plate life when combined with the uniformity of the plate and the expertise of the press operator to achieve impression settings.

The compressibility of the mounting tape is typically dictated by the type of print required, i.e. solids, combo, or screens. The more compressible the tape, typically the less force the plate takes. However, if the compressibility results in pin holing, then the operator's typical response will be to adjust impression, thus affecting plate life. Once the plate is mounted and staged for pressruns or cleaning, it should be wrapped in a black or opaque poly with the edges sealed to protect

against UV light and ozone. In years past, mounters and press operators alike have used release sprays in screened areas of photopolymer plates in hopes of minimizing dirty print.

PRESS CREW
One of the most vulnerable times for plates to be damaged is when putting print cylinders in and taking them out of the press. Setting final ink and impression settings at press speed will help in achieving the kiss impression needed to maximize plate life.

Understanding your ink system, extenders and cleaners is important in maintaining not only plate life, but also color, viscosity, and pH. Some solvents are not compatible with photopolymer plates above certain levels. Most alcohol/ glycols are acceptable for use with photopolymer plates, with a few exceptions which include undiluted octyl, benzyl, and methyl. When adjusting pH, most amines are compatible, with the exception of morpholine. A swell test can be performed to determine the level of compatibility of the solvent and the photopolymer plate. If swelling is less than 50 microns and there is a loss of less than 3 Shore A, then the solvent would be considered resistant.

CLEANING AND REMOVAL
In order to maximize plate life, plates should be cleaned immediately after the pressrun. Extreme care is required when demounting photopolymer plates. Some plate manufacturers supply demounting tools which assist in the removal of the plate from the cylinder. No sharp objects or knives should be used, as they could damage the plate.

PLATE STORAGE
Plate, sleeve, and cylinder storage systems vary from convertor to convertor. Regardless of the system used, minimal contact minimizes damage, a suitable temperature for storage is required, and there must be protection from UV light and ozone. Remember, some photopolymer manufacturers recommend not stacking plates more than 6 inches high.

Tim Reece is a member of All Printing Resource's Technical Solutions Team, where he has been employed for the past 17 years. He has 33 years of experience in flexographic printing, and has been certified by the NCSS (National Council of Skill Standards) in Graphic Communication at an Expert level.