

Improving Plate Life



One of the most frequently asked questions in flexo is, How long should a photopolymer plate last? In order to maintain the life of your printing plates, I'd like to discuss the many causes of premature plate wear so that you will be attentive to common problems that can affect print results and decrease the life of your photopolymer plates.

Quality Platemaking

Exposure: Proper back exposure will improve the adhesion of the support to the polymer. Optimum exposures will also fully crosslink the monomers, producing a more durable plate. To eliminate the possibility of underexposure, especially on solid/reverse type plates, do not choose the minimum main exposure time. There is usually enough latitude in the plate to give it an extra minute or two of exposure time, ensuring that you have fully polymerized it. If your main exposure time is set for the minimum, you risk underexposure and reduced plate life. Post exposure fortifies the dot formation.

Washout: Excessive washout can damage the characters of a plate, especially if it is underexposed.

Drying: Insufficient drying will send a swollen plate to press, possibly resulting in an overimpression situation that can cause premature plate wear.

Light Finishing: Finishing too long will weaken the plate and cause cracks to appear, both on the floor and in the image. Also, an overfinished plate may not transfer ink as well, with the print appearing as though there were insufficient plate-to-substrate impression. **As a result, the operator may overimpress** to compensate, causing premature plate wear.

Press-Related

Incompatible Inks: Once the plate is well made, carefully mounted, and ready for printing, be aware that photopolymer plates are resistant only to certain types and amounts of solvents used in inks and cleaners. Using the wrong solvents, or using the right ones in high concentrations, can cause swelling, shrinking or cracking.

Highly pigmented water-based inks can also accelerate plate wear if the ink is allowed to dry on the plate surface or anilox roller. If the inks pH drops, it can cause it to set up as a dry film that does not rewet. This dried film may flake and form a grinding compound that can chew up the plates.

Problems can also arise when using hydrocarbon defoamers instead of silicone ones because they, too, can produce swelling and cracking of the plates.

Solvents: Photopolymer plate cracking seems to be more prevalent during the summer months than in the winter months. The environment changes during the summer months introducing several factors that can accelerate plate cracking. During these months, excessive heat swells the plates that are in contact with aggressive inks to a higher degree; the humidity necessitates the addition of more acetate to keep the ink flowing (summer blends); and the environment introduces lightning storms, excessive sunlight and ozone. A recent investigation also revealed that an area hit by excessive lightning storms contributed to high ozone levels in a typically safe environment using water-based inks.

The most common element accelerating cracking at low ozone concentrations is the use of inks and plate cleaning solutions containing high levels of acetates. Many printers use aggressive solvent inks and cleaners outside of plate manufacturer recommendations. The printer apparently can use these inks during the winter months, with the same inks causing problems during the summer months.

Impression: A major cause of premature wear is overimpression. To get the most out of your plates, do not excessively "squeeze" your plates to the anilox or substrate. Back off a bit on impression to decrease friction. Excessive anilox-to-plate or plate-to-substrate impression can cause wear on the lead edges of your plates, as well as abrasion, scuffing and stress cracking. Not coming squarely into the proper impression can also damage the plate. You should have equal impression across the width of the web and anilox roll.

Cylinders: One of the most important factors in maximizing print quality is the condition of your printing cylinders. Most cylinder manufacturers target a tolerance of 0.00025 TIR (Total Indicated Runout) on their cylinders. Excess TIR may result in having to overimpress part of an image in order to get other parts to come into contact with the anilox and substrate. Staying within specified tolerances can improve your print quality and increase the life of your plates.

Substrates: Abrasive substrates can shorten the run length of a plate.

Plate Storage

Plates should be cleaned thoroughly of ink with a compatible cleaner and a **soft bristle brush**, immediately after printing. Abrasive cleaning solutions or brushes will have a negative impact on the plate. Inks should not be allowed to dry on the surface since they may become difficult to remove and can lead to surface damage from scrubbing or cracking when the plates are flexed.

Plates should also be protected from UV light. White incandescent or fluorescent light, window light, and sunlight must be avoided. Light can cause the plate to crack. Do not store plates near heat sources, or in areas of high ozone concentrations. Demounted plates should be interleaved with paper or foam sheets and stored flat in envelopes or wrapped with an opaque medium if stored on sleeves or cylinders.

Proper plate handling and storage practices are not new, but they can help. We recommend that if you haven't been following them, summer is a good time to put them into practice. Tradeshops should share them with their customers.

1. Keep levels of aggressive solvents in inks, extenders and cleanup solutions low.
2. When mounted, waiting to go on the press or to be cleaned, **WRAP** plates in Saran Wrap or black poly (to protect against whitelight) with the edges sealed.
3. Clean the plate as soon as possible after printing with a **compatible cleaner**.
4. Allow the plates to completely dry after cleaning, then store them in envelopes, drawers, or, if mounted, **WRAPPED** in Saran Wrap or in black poly (to protect against whitelight) with the edges sealed.
5. Always keep plates away from any light or heat sources or areas of high ozone concentration.
6. Coating the plate with Armorall prior to wrapping for storage can aid in preventing cracking in some cases.

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