

Tech Tip 14

Flexo Plate/Ink Compatibility

This Tech Tip provides both a general quick-reference compatibility table and an easy-to-follow test to determine plate/ink compatibility for MacDermid sheet photopolymer plates.

Printing inks are formulated from a variety of solvents. Mixtures of several solvents are often employed to obtain the combination of properties desired. Since some plate materials will be damaged or perform poorly when contacted by certain solvents, it is important that plates and inks are compatible. When in doubt, it is best to check before a print run rather than find out on press.

General Compatibility

Ink companies are obviously interested in making their products as broadly applicable as possible, and so they make every effort to make their inks compatible with a broad selection of flexo plates. In many cases, compatibility issues are caused by ink additives used to customize ink to particular applications or to overcome issues with a particular job.

Water-based Inks

Most sheet photopolymer plates are fully compatible with water- or alcohol-based inks.

Solvent Inks

Concentrations of acetate up to 10% are well-tolerated in most cases, although this can vary depending on the co-solvents used. Above 10% acetate concentration, plates may swell after prolonged exposure. Concentrations of >20% acetate are not recommended. Hydrocarbon solvents (e.g. hexane, toluene) are not recommended.

UV Inks

Sheet photopolymer behavior with UV or EB-cured inks is variable; most are well tolerated, but some will cause harmful swelling. We recommend testing of UV inks with plates prior to use to make sure no undesirable side effects are encountered.

For a quick check of the general compatibility of your plate materials and inks, refer to the table below. Note that these recommendations are for pressready inks and not pure solvents, and that the effects of solvents are often additive (e.g. if you have 10% propyl acetate and 15% ethylene glycol, it may behave differently than either solvent at a 25% concentration, and likely will be more aggressive than either solvent alone).

General Sheet Plate Solvent Compatibility Guide

Solvent	Compatibility
Alcohols	
Methyl Alcohol	G
Ethyl Alcohol	G
Isopropyl Alcohol	G
Normal Propyl Alcohol	G
Aliphatic Hydrocarbons	
Hexane	NR
Heptane	NR
VM & P Naphtha	NR
Aromatic Hydrocarbons	
Toluene	NR
Xylene	NR
Esters	
Ethyl Acetate 20%	F
Isopropyl Acetate 20%	F
Normal Propyl Acetate 20%	F
Glycols and Glycol Esters	
Ethylene Glycol	G
Propylene Glycol	G
Cellosolve 20%	G
Butyl Cellosolve	G
Ketones	
Acetone 20%	NR
Methyl Ethyl Ketone	NR
Miscellaneous	
Water	G
2-Nitropropane	F
Ammonia	G

G=Good; F=Fair; NR=Not Recommended

Plate Compatibility/Swell Testing

We recommend performing a submersion swell test to confirm ink compatibility. This test measures the changes in thickness and durometer that occur when plate material is soaked in pressready ink. To improve the accuracy of measurement, we recommend testing three replicate samples and averaging the result.

Test Procedure

1. Assemble three duplicate samples of fully cured plate material and pressready ink.
2. Identify the samples uniquely. Scratching an identifying code into the polyester backing is the best way to do this. Measure the starting plate thickness and durometer for each sample, and record in a table like the one below.
3. Submerge the plate samples in ink and allow them to soak for the time closest to expected press run time. Keep the ink at room temperature or the temperature you expect the ink to have during the print run. Typical soak times are: short run - 4 hours / long run - 24 hours.
4. Remove samples and record soaking time. Wipe samples dry and measure and record thickness and durometer. If you wish, you can take measurements on the same sample repeatedly and replace the sample in ink for further soaking.
5. For thickness, calculate the percentage of change from original measurements and average results for replicate samples.

Compatibility Test Record Table

Plate Material _____ Ink _____ Soak Time _____

Sample	Thickness			Durometer		
	Initial	Final	% Change	Initial	Final	% Change

Ratings: Good: 0 -5% change
 Fair: 5 – 10% change
 Not Recommended: >10% change