

Guides to Better Printing **Printing on Non-Porous Substrates**

A non-porous substrate is any paper, metallized paper or plastic that will not absorb any ink oil that is present in a conventional ink. This includes, but is not limited to: translucent, foils, poly-ethylene, poly-propylene, poly-styrene, poly-ester and vinyls. Because of this, special high solids inks are required. Additionally, non-porous substrates do not absorb water and thus the press tends to run wetter which affects the inks. What follows is to our recommendations to get the best drying from our inks when printing on non-porous substrates.

Inks

The Printing Ink Company has a full line of inks suitable for printing non-porous substrates. Our line is called Oxi-Set NP. These inks contain 100% solid vehicles and large amounts of drying oils. These inks dry by oxidization instead of penetration and evaporation as do conventional printing inks. This means that oxygen must be present in sufficient amounts to allow the ink to dry. The Oxi-Set NP line of inks also contain other ingredients to allow them to perform well on the press, transfer well to the substrate and still set fast enough to minimize the amount of anti-offset spray powder that is used. Oxi-Set NP inks will still not set as fast as a conventional ink would on a porous substrate like gloss coated but the slow setting and fast drying insures that the inks will adhere to the stock.

The Printing Ink Company's Oxi-Set NP line includes a four colour process set and the base PANTONE colours. In addition, we offer a lightfast equivalent of all the colours to maximize the utility of using a non-porous substrate. We have had some successes with poly-metallic blends but are unable to offer oxidizing Metallic base colours, nor Fluorescent colours.

Fountain Solution

The Printing Ink Company has partnered with Unigraph to provide the best fountain solutions available. When running non-porous substrates the biggest concern is ensuring the inks will dry. When running conventional inks and conventional paper the excess water can often be absorbed by the substrate. When running non-porous substrates the substrate cannot carry it away and so that fountain solution is absorbed by the ink. In order to make sure that the ink can still dry with this extra water some care must be taken.

First off, start with fresh fountain solution. As the fountain solution gets used certain chemicals leach out of the papers and inks (increase conductivity) to make them more readily absorbed by the ink. This is bad because the inks will already be carrying more water when running the non-porous substrate.

As far as the choice of solutions goes, we ink makers prefer the use of Isopropyl Alcohol. We realize this is not the first choice for an environmentally conscious printer and we will get to an alternative shortly. However, alcohol does two important things when running on non-porous substrates. The first is it makes the water wetter, which translates into being able to run less water (alcohol replacements do this too!) and the second is they evaporate readily out of the ink (not true of alcohol replacements). In affect by running 10% alcohol the ink when it starts to dry will have 10% liquid to have to contend with. Our recommendation is Unigraph Lithofount 96G fountain solution with 10% alcohol.

The alternative to Isopropyl Alcohol is of course an alcohol replacement. These chemicals make the water wetter but remain in the ink while it is drying and they are not created equal. We have the most confidence in Alcofount-2 from Unigraph. It is strong but not overly aggressive. An even better alternative is their Alcofount-3. This has the same wetting agents as the Alcofount-2 but with an additional chemical to help the ink dry. Again, the most important thing from the ink drying point of view is to run the minimum amount of fountain solution to get the job to print. Please remember never to use Isopropyl Alcohol and alcohol replacement together.

Other solutions will work, of course, and we would be happy to test their compatibility with our inks.

Additives

The Printing Ink Company offers a variety of ink additives to maximize our inks performance. In particular we have ink driers called Aqua-Dri drier D 33. This chemical when mixed into the ink which is then emulsified on press releases oxygen right ink to the ink film. We have seen this reduce the drying time by as much as 50%.

Another useful additive when printing non-porous substrates is Ink Drying Stimulator (U319). This chemical is water soluble cobalt--the most active drier available. By adding it to the water it can also help the ink dry faster. This is preferred to adding the cobalt to the ink because it does not affect the ink on the rollers and it increases ink concentration as the ink absorbs more water and needs more help drying.

Spray Powder

Spray Powder is an often overlooked component of successful printing on plastic. The right sized powder will give separation of the sheets. This affect is two-fold. First when the sheet initially delivers, it is less likely to slap together and cause ink transfer. Second, by giving separation of the sheets, more oxygen is able to flow into the pile and help dry that job. The size of powder required varies by print-job because non-porous substrates vary greatly in weight. We can help you make that determination once you have selected your particular substrate. Keep in mind that all of the ink sits up on top of the page and thus presents more ink to protect at any given substrate weight.

Further Points to Consider

There are many things that can affect any print job. These are some further points to consider when running these types of jobs:

*Static Eliminators are available on some presses. These help the sheets feed well and not slap together in the delivery. Stay-open spray should be used sparingly, if at all.

*Stay-open sprays entrap oxygen. Without oxygen the Oxi-Set ink cannot dry. We understand that this product allows greater latitude when making-ready, but please use caution.

*Dosage of the fountain solution may also play a roll. Too low a pH can affect Oxi-Set inks drying. But, so can running a higher pH by not adding enough etch. Allow the minimum amount of fountain solution to be run.

*Aqueous coatings are a common printing practice. On non-porous substrates they allow the printer to run high piles and possibly back up jobs more quickly. However, remember that Oxi-Set inks require oxygen to dry and an aqueous coating seals that ink away from the air. This may prevent the job from being further processed in a timely fashion. This is always a trade-off.

The Printing Ink Company has extensive experience working with non-porous substrates. We are always willing to test our inks with any substrate and fountain solution combination. We can even provide press side support should the need arise. In fact we have been working closely with Transilwrap and have completed successful testing with their full line of non-porous substrates.

Please feel free to contact us to discuss your next non-porous substrate job.

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