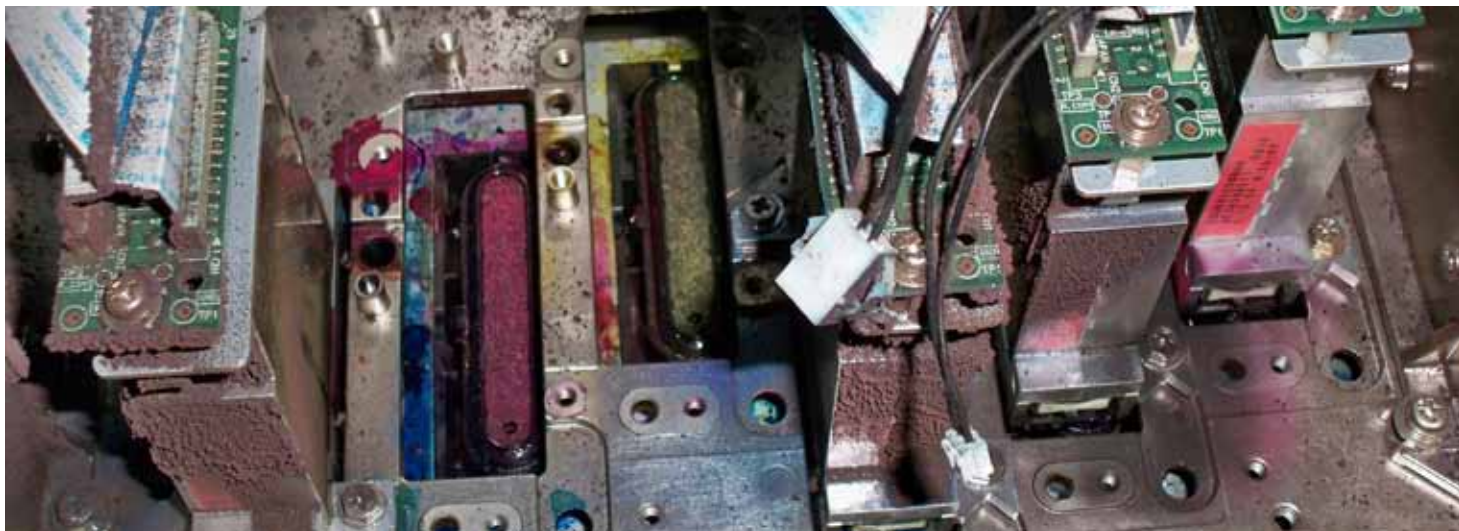




## Common Sense Maintenance For Solvent-Based Inkjet Printers



As a service company, we love when we get calls for printer service. It's an opportunity to help in a moment of need, but too often the needs we see are a crisis that shouldn't have happened. It's amazing that people often spend more for a piece of equipment that makes them money than they spend on their car, which costs them money, but they will take far better care of their car. Not only does this apply to the cosmetics, where people put solvent-soaked cloths and splash ink all over their printer, but more importantly, the mechanics, which are the heart and soul of the printer.

Would you place a solvent-soaked cloth on top of your car's finish? Do you drive your car 20,000 miles between oil changes and wait until it breaks, or do you change your oil at regular intervals?

The good news is, maybe you can't perform the full preventive maintenance program your printer needs, but you can do your own "oil changes" or at least perform basic maintenance between major service intervals, often stretching that service interval out further. Like your car, your printer has critical fluid systems. In virtually any mechanical device, the fluid systems need to be kept clean for optimum life and performance. Your printer is no different. In fact, due to the volatility of

the solvents, the ongoing maintenance is even more critical than your car, for which most systems are sealed (e.g. your cooling system, oil, gasoline, etc).

In the case of your printer, there are printheads and caps/capping stations/maintenance stations that are exposed to air when printing, and either may be left exposed and in danger of drying out if there is a mechanical or electrical failure, or if poorly seated/sealed when in a resting position.

Though each printer has its own maintenance routine, there are a number of things that apply to much any printer, regardless of manufacturer. Let's consider the technology and what is going on in the printer, working from the waste bottle back through the system.

### **Ink Maintenance**

The waste bottle is the end of the line, where the wasted ink goes after you clean the printheads, wash the nozzles, prime the printheads, or whatever these functions are called on your unit. If the waste bottle is too full, or if the service line is gummed up, which feeds into it, the printer can get a bit clogged. Printers have a pump that pulls ink through the printhead and pushes it into the waste bottle.

*In virtually any mechanical device, the fluid systems need to be kept clean for optimum life and performance. Your printer is no different.*



Bob Flipse, Partner, Grafex Network



Overflowing or gunky waste bottles can really upset your system.

Even if you don't print for a while (a few days or more), continue your daily maintenance, and run a set of color bars equal to your inkjet each day.



Heat is the enemy of all electronics so keep fans and cooling systems clean.

Most of the printers mentioned have a pull-through pump system that draws ink through the printhead and helps prime it to keep ink flowing. In order to effectively draw ink through the printhead, there has to be a good seal between the cap and the printhead. Typically, the printhead has a flat surface and the cap is essentially a rubber boot that seals the connection between itself and the cap.

If you don't have a good seal, air leaks may occur when the pump tries to pull ink through the printhead. When this happens, no ink will pull through the head and it won't prime. In cleaning cycles, it won't clean either. Either one is bad news, of course. Several things can cause a cap/printhead seal issue:

- **Old and worn out caps.** These are rubber and they will overtime deteriorate with the constant exposure to solvents and heat over time. The solution is to replace the caps.
- **Poor alignment of caps and printheads.** If the caps don't seal the printhead in the correct position, you will have air leaks. The solution is to have a capping station alignment performed.
- **Problem with capping station motor.** Although the specifics may vary from model to model, some employ motors/belts to raise or lower the caps during/after printing. The solution is to repair/replace the motor assembly or affected parts. Poor maintenance of the caps can result in crusting of dried ink and pigments right where they need to seal — cap to printhead.

Additionally, failure to keep the caps clean will result in faster degradation. Even when you finally clean with solvent and swabs, the crust becomes abrasive and tugs off bits of the cap in the process, resulting in premature failure. The solution is to take swabs and maintenance solution and gently swab the caps — regularly.

No matter how good you are at keeping the caps clean, there will still be an accumulation of pigment in the cap itself and down below. Use a recommended maintenance solution to wash the caps, sufficient in quantity to run right down to the waste bottle. This will thin out the accumulation and help avoid the "clogging" of waste ink getting to the waste bottle.

Another crucial component of your ink system is the wiper/wiping station. On most printers, this is typically a rubber blade that wipes across the printheads periodically during printing. Using what you now know about your own ink system, what do you think will happen if you allow

your wipers to be crusted with dry ink? The crust can be transferred to your printheads, and dried particles of ink pigments can be pressed into the orifices in your printheads — with disastrous results. Use the same care you do with your caps. No, these are not "seal" critical as are the caps, but less efficient wiping can have great effects on your print quality too.

### Best Practices

Keeping the ink flowing and the printheads "wet" is critical. Workload varies from shop to shop, and even busy shops may have down days where they don't print too much or at all. Even if you don't print for a while (a few days or more), continue your daily maintenance, and run a set of color bars equal to your inkjet each day.

If CMYK, do about four to six inches by 12 inches (15.25 x 30.5 cm) blocks of 100 percent of each color. If you have light cyan and magenta, make it six inches by eight inches (15.25 x 20.3 cm) blocks with the light colors being only 40 percent density to assure that ink color is being used by the RIP. The same goes for orange, green or white ink. See below for an example. This will force your printer to use these colors even if you are not printing at the time. Scale according to the width of your printer and material.

Some printers even have a thin "confidence stripe" that automatically prints on the edge of the graphic to assure that all colors are being used all the time. If your printer or RIP does not have this feature, create your own confidence stripe around a half-inch (12.7 mm) wide with all four to six colors and run it the length of the graphic.

Printing the full width bars as described above is also a neat trick to help unclog otherwise serviceable printheads that may have a few clogged nozzles. When they come up, don't ignore the error messages and PM (preventive maintenance) flags on your printer. The manufacturers put them for a reason, and like an oil change, they should not be ignored.

If you aren't planning to use your printer for a while, longer than a month or more, you should have your system flushed. There are right and wrong ways to flush a printer. Additionally, there are specific storage fluids, which are not as volatile as maintenance solvents, so they won't dry out as quickly and your printer will be protected longer.

### Manufacturer Inks

All printers start with original equipment manufacturer (OEM) ink, which is

recommended by the manufacturer. Of course it makes them money, but there is a good reason it is required to maintain your warranty out of the gate. The manufacturer's ink is formulated with the proper chemistry, viscosity, volatility and even pigment particle size to properly flow through the ink system and printheads.

There is a lot of physics and chemistry going on here — you have flow of ink from cartridges or tanks through ink lines, through dampers, which generally have filters in them, and then have to be jetted out of microscopic orifices at precisely the right size, moment and direction to get a clean print. If the ink dries too fast, it may coagulate on the printhead during printing, or overnight while the printer sits. The ink may not spread enough when it hits the vinyl and you may see print banding. If the particle size is too large or irregular, your printheads may clog. If the ink dries too slowly, your prints may not dry before they wind up on your take-up system and they will be ruined. Even the temperature settings with the pre-, print-, and post-heaters come into play. This is not to say that there are not a number of good options for alternative inks out there. There are, but not all ink is created equal. A discussion on ink is an article all to itself.

#### Covering the Mechanics

For the most part, there is less to do with

the mechanics of your system as compared to the ink train. Keep the rail where the printhead carriage traverses back and forth free of contamination and lubricate occasionally with the manufacturer's recommended lubricant. Periodically perform a gentle cleaning on you encoder strip with isopropyl alcohol, or a soap and water mix with a just a bit of soap, as you would to wash your car. The encoder strip is generally a clear plastic "ruler." The printer counts the tic marks on it so it knows its position as it traverses across the material. Recommended maintenance details, materials and intervals vary, so consult your owner's manual to be sure.

In addition to the moneymaking part of your printer, it's important to keep it looking good as well as productive. Don't put solvent-soaked cloths, syringes, pipettes, bottles, or other maintenance items on your printer. If plastic, it will melt, and if paint, it may mottle the paint. If you splash ink on your printer, wipe it off, quickly! Don't use a blade across the heater platen on your printer. No different than your car, no one wants a scratched up or scarred printer, even a used one. If you decide to sell it someday, it will be worth more when you have given it proper care.

As we go out in the field, we see everything from the proverbial "you can eat off it" printer to some real ugly messes. Generally, the "proverbial ones" have better

and more consistent results and longer intervals between major services. Though we recommend PM intervals of 12–18 months, we hear of some people going three to four years or more before service is required.

Bottom line, if you take care of your printer, it will take care of you, and last longer as a result. Give yourself your best chance at success. Sometimes with even the best and most fastidious care your printer will break down, just like your car.

*A 20-plus year industry veteran, Bob Flipse was an early innovator in wide-format digital printing. Starting in aqueous, his knowledge now covers solvent, UV and other ink technologies. Flipse is currently a partner at GrafX Network, a nationwide service company for wide-format printing equipment.*

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