Score Lines, Dings, Dents and Corrosion: What’s a printer to do?

By Mike Huey
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Every seasoned flexographic printer should understand the value of aniloxes to their printing press. It is not just a matter of having the right specifications such as cell count, volume, and finished diameter; often the day-to-day operations rely on more mundane and overlooked values such as cell condition and damage. While the costs of replacing aniloxes are relatively nil compared to operating costs, material use, and ink, when aniloxes don’t perform you can waste thousands of dollars in time and material over the course of a year. The important concept of maintaining your aniloxes in good running order continues to be an afterthought in many shops due to the lack of knowledge of new operators and assistants, a demand for production, and complacency due to the perceived reliability of operator skills. When production numbers are reviewed, what stands out are the real dollars wasted when you can get 100 percent return on thorough review and maintenance of your anilox inventory.

During those days, it was uncommon to need to change the rubber roll and chrome roll; both stayed in until they were deemed to be worn out. The cleanup was quick and simple—drain the ink pan, pour solvent/water over the two rolls and spread them apart, and dry with a towel. I cleaned many two-roll systems, and it was a painless experience, a very simple system indeed.

Simple systems have their limitations, and the need for more sophisticated metering and anilox technology became apparent as print quality expectations were raised. Unfortunately, as it often happens with new technology, there are no good written instructions included.

As pioneers using new technology, it takes experience to develop good methods. Our company installed enclosed chambers that eliminated the side/back splashguard, but introduced a whole new array of variables. With these new chambers came steel blades, ceramic anilox rolls, more anilox changes, and an increase in anilox cleaning. The initial days of this change were golden in printability, ink control, and notable press speed improvements. The increase in profits and productivity masked the shortcomings in using the same old methods for the new technology. After the initial joy, it became increasingly obvious that we were dealing with completely different animals. The anilox volume on a bladed system was now critical and needed to be maintained, and damage was on the increase due to anilox changes in presses not designed for the new frequency of tooling exchanges. The ink film was thinning, and the margin for error also thinned as the amount of mechanical adjustment in color was essentially eliminated with a chambered system.

When I started my career in flexographic printing, we had a few 1969-1971 CI presses that ran on two-roll systems. For those that have not run a two-roll system, these were made up of a rubber roll that was submerged into a pan of ink. These rubber rolls would turn in the ink pan, normally with side splash guards, back splash guards, and a cover to minimize ink/solvent evaporation. The aniloxes in these systems were normally surfaced with chrome. The rubber meter roll was pressed against the chrome roll forcing ink into the anilox, which would transfer to a rubber plate and then to the substrate.

Many years after these changes were made, I made a job change from printer/manager to anilox supplier. One of my first customer visits was to an old-school printer that had spent the last 40 years in the business. I was there to make sure that they didn’t ruin the new rolls for that new press at startup. The printer looked at me and said, “Son, I have been in this business for 40 years, and we have never worn out an anilox; however, we have damaged or ruined over a million dollars worth of anilox rollers.” I realized at that point that what I experienced earlier was the same thing he experienced, and we all had to learn the hard way. It is my
intention to pass along our hard-earned knowledge so that you can make the most of your production day. The lessons we have learned are outlined as anilox care maxims that every printer can follow.

**Important Maxims for Any Anilox Care Program:**

Aniloxes have great wear resistance, but poor impact resistance. Gravity, poor anilox storage areas, and poor anilox workflow contribute greatly to anilox damage potential. Have your press area reviewed by your anilox supplier’s technical staff to assess potential risks and eliminate them.

Better to clean an anilox before you need it so you do not waste production time cleaning it. Have cleaners and an off-press system that is effective in removing your particular ink. It is not enough to say that a cleaner is effective in general terms such as UV, water, or solvent. Test it on your particular ink system or systems. If they do not remain effective, then something may have changed with the ink itself. Whatever the case, the effectiveness of the anilox cleaning must be reviewed periodically to maintain desired results.

Do you see signs of pitting on the journals and journal headers? These are signs of a cleaner dissolving the metal construction of the roll. This can lead to blistering under the ceramic and ruin the engraving. Raised areas in the ceramic are telltale signs of corrosion underneath. If you use a corrosive cleaner, make sure to rinse it out of the anilox thoroughly. If you do not already know, find out what cleaners you are using and check MSDS and technical data sheets. Consider alternative non-corrosive cleaners if thorough rinsing proves to be a challenge.

Have a way to review your anilox rolls visually. This entails using a simple scope or perhaps a robust scope that measures volume as well. Either way, you want to confirm the condition before the roll is used again.

Make sure anyone who is going to come in contact with your inventory get the proper training on care and handling. Most of the damage we see is from care and handling from those unaware of the delicate nature of the engraved surface. Do training as often as you need to with your anilox supplier to emphasize the importance and how-to of anilox care.

One drop or slip with the anilox can be terminal for that particular engraving. Drag marks and scratches cannot be hidden unless the right plate demand comes along. Matching defective rolls to the right copy takes valuable time, so designate before going to press if you choose to use a damaged anilox and ensure that it will not be present in the imaged area.

Anilox handling includes potential abuse by the doctor blade system. These systems are precision instruments, and yet we see these systems shimmed with wooden paddles, excessively pressured for metering, dropped, and bent. These all contribute the most to rapid anilox wear/scoring/damage. If you are not sure of your blade metering
Today’s flexographic printer must understand and embrace these challenges to be competitive with both domestic and international competition and alternative print methodology. Ignoring the condition of your anilox inventory can be perilous. Provide your people with the knowledge and skills to ensure the long life and endurance of your anilox rolls so the profitability you need can be realized in the savings of material and ink costs. Don’t allow a lack of training of new employees to damage your bottom line. Information is power and creates understanding. Your best resource for this information, training, and expertise is the technical staff of your anilox provider.

About the Author:
Mike Huey started his career in the printing and converting industry in 1990 working in manufacturing film and rotogravure printing for a company with a target focus on high-end bag manufacturing, most noticeably providing Pampers’ and Luvs’ diaper bags for Procter & Gamble. During these two years of employment, his focus was to learn the stages of bag making and various equipment used in the process—i.e., blown film, printing, tubing, bagging.

During the last nine years, he has been employed by Harper Corporation as the Technical Manager for the Western Division. His current role is to support and advise customers throughout the United States. Some of his accomplishments are: Certified by the National Council for Skills Standards as an expert flexography, published technical articles and spoke at the FTA annual forum in 2005, 2006 as well as other workshops and trade events. Throughout the last nine years, Mike has published countless technical articles in various trade magazines and online resources.

performance, have your anilox and/or blade supplier examine the system.

Have your doctor blades checked periodically for running blade angle, scorching, uneven wear, etc. It is not just the blades getting abused; your anilox is also getting punished.

Make sure blade clamps are not worn. If the blades can wiggle or float inside a tightened blade assembly, the clamping system is worn and needs replaced. If the blade clamps were anodized and you can now see raw metal, this is a definite indication of wear. All bolts must be used. We have seen doctor blade assemblies threaded together with two bolts instead of five, and this just doesn’t hold the blade within the design tolerance. Many of these aspects in particular are overlooked by printers. It takes an awfully long time to develop these blade clamp problems, and it is, therefore, not easily recognized.

Higher cell counts mean thinner cell walls and an even more delicate structure. In many cases, these rolls are dedicated to process printing and are frequently exchanged in the press as print demands change. Be careful with all aniloxes, but especially this type of anilox.

Plan the press schedule as much as possible to minimize the frequency of anilox or other tooling changes; this saves both time and damage potential. The least amount of time handling these tools, the less likely they will be damaged.

Moving Forward
Over the last twenty years, we have learned the hard way that established methods no longer apply to the evolving manufacturing practices in flexography. We began by understanding the heart and soul of any press is the anilox. Quality aniloxes are often so reliable that they are underappreciated until one drop or ding ruins the engraving. Failure to maintain and verify anilox cell condition adds to the mystery and misery of ink and material waste when color matching.