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The Importance of Maintaining & Managing Anilox Inventory for Flexo Operations

By Bill Poulson

The anilox roller is a critical component in flexography operations on a day-to-day basis, and the ceramic laser engraved anilox in particular has lent stability to the flexo process. These two facts alone are reason enough to pay special attention to roller maintenance and care issues. Of course, over-handling of the anilox rolls increases the chance for damage; therefore, handling should be kept to a minimum. Other major variables that can cause premature wear and shorten the work life of expensive anilox rolls include ink contamination, warped chambers, over-impressing doctor blades, ink starvation and general lack of preventative maintenance. These variables warrant some further discussion below.

Ink contamination

There are many types of inking systems in the print industry. Not everyone has new presses with the latest and greatest doctor blade chambers and all the bells and whistles that come with them, so filtering the inks is a critical step in the optimal use of anilox rolls. Some smaller print operations use individual ink pumps at each station while others use larger systems to pump from a central inking area. Doubling up filters should be done when at all possible. Regardless, filters need to be cleaned on a regular basis. In my travels I have seen clogged filters get thrown out, although this is an obvious indication that they are working. Pressroom personnel should set up periodic cleaning schedules to maintain these filters, because some inks clog faster than others while some are more abrasive. Thus, it is important to set up particular schedules for changing filters according to ink type.

Another component of good preventative care for anilox rolls is the use of rare earth magnets which trap metal debris from entering the inking systems.

Doctor blade chambers

The ink chamber makes contact with the anilox roller at all times and needs to be monitored 100 percent. Maintenance programs geared for them should be put into place at daily scheduled intervals. Some rollers require many chambers, so costly problems can develop down the road without an established maintenance plan. Always keep the chamber and the print station area clear of residual ink. This will allow the equipment to last longer and will prevent issues with anilox rolls over time. There are many variations with ink chambers on newspaper presses in particular. Many printers use retrofits that work well, including modified chambers or rebuilt ones that may have had warping issues in the past. Keep a close watch on doctor blade wear across the press. Doing this will often identify misalignment issues, warped chambers or pressure inconsistencies from side to side.

• Ceramic tip blades

Recently, positive results have been achieved using ceramic tipped blades. Some printers use steel blades, which definitely require magnets in the system to trap fragmentation. Currently plastic and fiberglass blades are industry standards.

• End seals

Excessive end seal leakage can be a sign of a warped doctor blade chamber or just the need to modify the



end seal. More often than not, printers will struggle with this problem rather than solve it. In response to end seal leakage, operators sometimes over-impress doctor blades, which is a major cause of anilox roll wear. The goal should be to use the lightest possible pressure to achieve a good seal and good metering contact with the anilox. The blade's setting and the seal settings need to be exact. Over-impressing forces the blade to roll over and sliver, causing score lines and other imperfections on the anilox roll surface.

• Warped ink chambers

When the doctor blade chambers are new, they are parallel to the anilox roll and make true contact with the anilox roller. The end seals also sit evenly and create the seal necessary for even, low pressure contact between the doctor blade and anilox surface. Over time, they can warp or get knocked out of alignment. The chamber should be checked periodically to ensure that there is a true and perfect alignment with the anilox roller. If warping is detected, it may be corrected short-term using a brace to straighten the affected chamber. While this technique is only a temporary fix, it can be effective.

All printing press crews should check the wear across blades in every chamber each time one is changed. If a chamber is out of alignment, it will be detected immediately. If it is warped, the effect will be visible. When loading the chamber, operators should be sure that ink is metered across the chamber evenly. If they discover that extra pressure is needed to get the middle of the chamber to meter properly, the chamber may be warped.

These types of operating checks should be implemented at the operator level. No one is closer to your presses' daily movements than your operators, so train them to notice these indicators of potential anilox roll damage.

• Loading mechanisms

Loading mechanisms vary in design on all presses. As mentioned earlier, new presses will have the latest and greatest equipment, making them less likely to have pressure and contact issues. Older presses have mechanisms that may need to be replaced, lubricated frequently, or retrofitted.

Brackets are a critical component to be aware of as well. Chambers are changed and cleaned daily, then go back on press. This constant procedure will produce wear and tear of brackets over time. Bracket slots and holding mechanisms will eventually become fatigued or elongated from daily operational rigors. If bracket wear is detected, they should be replaced periodically.

• Ink starvation

Ink starvation is a definite culprit in damaging anilox rolls. Anilox rolls should never be run while dry. Presses with multiple chambers should be inspected on a regular basis and incorporated with other inspection practices already mentioned, such as parallelism and end seal checks. Ink intake and outflow must be balanced as it sometimes becomes out of sync over time, especially if there are blockages or other ink flow issues. Avoid too much positive pressure, as it may alter blade contact and cause an inking inconsistency which affects dot gain and drying time on the press. Do not over-impress the blade to achieve greater ink density. This will wear out the anilox roll very quickly.

• Clamp maintenance

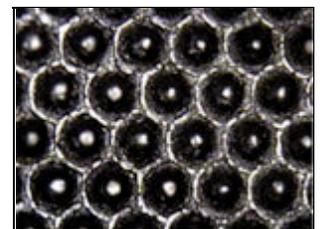
Periodically, clamps should be disassembled and carefully cleaned to ensure an even clamp-down to the doctor blades. It is never a good idea to over-tighten the blade clamps. Ink migrates up and under clamps over time, a problem that is often missed during inspection. Also, anilox rolls should be visually inspected on a controlled schedule. Delegate this responsibility to press room personnel who will do a thorough job and document each step in the process.

Care and maintenance of anilox rolls

Tracking the Life of the Anilox

Tracking the wear on anilox rolls is also a very important step in setting up a maintenance and care system. Create a histogram or spreadsheet to track the daily wear of blades and to record day-to-day density. The anilox is a major investment and a little time invested to record wear is easily justified.

The photographs above illustrate an example of efficient tracking. This is an excellent method to track anilox density and impressions. Use a handheld



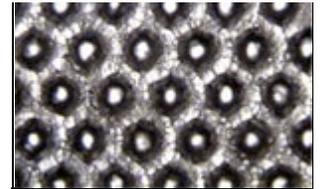
New anilox



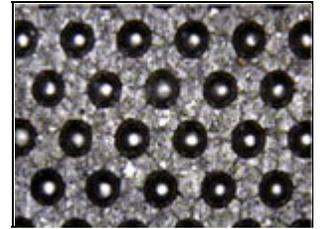
scope or microscope to visually check for cell wall wear and ink plugging.

• Cleaning the anilox rolls

Set up consistent procedures for cleaning anilox rolls. The rolls should be cleaned daily and carefully wiped down after the cleaning cycle. Don't just depend on the auto wash systems, but visually inspect the rolls to ensure that all decks are getting the proper flow of wash up solution. Remove all residual ink to prevent staining of the ceramic surface and to minimize any anilox plugging. With the proper magnification, it is evident when the roll is plugged. If the bottom of the cell can be seen, it is clean. Otherwise the roll is plugged as the example on this page indicates.



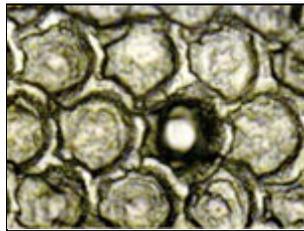
Normal wear over time



Time to replace

Use warm water where possible while cleaning the anilox. One printer concluded: "Too hot is not good" after finding an optimal cleaning method via testing his clean up cycle at various temperatures. High water temperatures can scorch the ink, which may cause plugging of the cells. One great system for cleaning rolls is as follows: The process is temperature controlled as a water jet sprays the rolls, finally flushing them for a set amount of time. Some modifications were also made to the chamber to keep the ink flowing and minimizing any ink sludge build-up that might normally occur. After the cycle is completed, the chamber backs off of the anilox.

Another cleaning method has been adopted with great results. This method involves using a dry ice system in combination with a scheduled program for cleaning anilox rolls.



Plugged cells

Summary

The key points of this article focus on the importance of scheduled periodic maintenance programs and detailed documentation to obtain optimal press efficiency. The anilox roll is one of the main investments of a printing operation and there should be very little allowance for major errors to occur with these units if profits are to be achieved. Clean and efficient press rooms result in fewer problems. Well-maintained anilox programs should result in substantial savings. Take an inventory of the current operation to find where improvements are needed. Implement a maintenance and care system while educating pressroom personnel on the program's overall importance.

A few small steps can result in huge savings.

Bill Poulson is the Northeast Technical Advisor for Harper GraphicSolutions, a division of Harper Corporation of America. He has been with Harper for eight years and has been a flexo printer for 36 years.