The Little Things

Small, Often Overlooked Issues Can Lead to Big Anilox Roll Problems

When working with a flexographic printer who is experiencing anilox roll scoring and other costly damage, a common misconception in the industry is that there has to be one major source for anilox roll scoring. I am often asked, "What is the cause of my scoring?" In my experience, there usually is not one major cause, but numerous, less apparent conditions which lead to anilox rolls being damaged on a regular basis. If there were only one cause, I feel strongly that the lead man, pressmen or press helpers would probably have identified the problem and corrected it before my arrival. So many – if not all – of the scoring-related calls that I respond to are due to many subtle, not readily identifiable problems.

Anilox rolls are commonly damaged during transit to and from the press. Dragging rolls across press frames, pans and other parts is – unfortunately – a daily occurrence in many pressrooms. Some uncommon sources of damage are scratches from metal belt buckles/rings/watches or other jewelry while smaller rolls are being carried. Dings can originate from contact with other anilox rolls, especially when going in and out of storage racks or being transported in a metal cart. Another source of damage while rolls are not in press include equipment – doctor blade chambers, pump hoses, ink pan covers, wiring, etc – stored on or very near rolls which can scratch or ding the anilox when moved. Areas around Anilox rolls should be kept free from clutter and trash, and clear pathways to the press should be present. An anilox cover for every roll is – in my opinion – mandatory. A large percentage of the damaged anilox rolls that I have seen in the field would never have been damaged at all if a cover had been utilized.

After the roll is safely in the printing deck, the possible source(s) of potential damage become much less easy to detect and pinpoint. A leading culprit is an improper doctor blade/anilox roll interface – the anilox roll and the doctor blade are not functioning together in a way that prevents anilox damage. A question I am often asked when discussing doctor blades is "How long can I run my blade(s) before they need to be changed?" My answer to that is "Until excess pressure is required to achieve acceptable print results" While not a direct, quantifiable answer, it is the most correct answer I can produce. Doctor blade life depends greatly on the abrasiveness of the material being printed – highly pigmented white ink will not allow a doctor blade to survive as long as a soft, resin-heavy coating, for example. Other factors include quality, thickness and type of material used, the lubricating properties of the material (ink or coating) being printed, and finally the pressure at which the blade is being forced against the anilox roll. Over impression of doctor blades is a large contributor to anilox scoring – many articles have been written on this very subject – with a light amount of pressure being far more desirable and giving much better print results. I always recommend a "kiss" impression

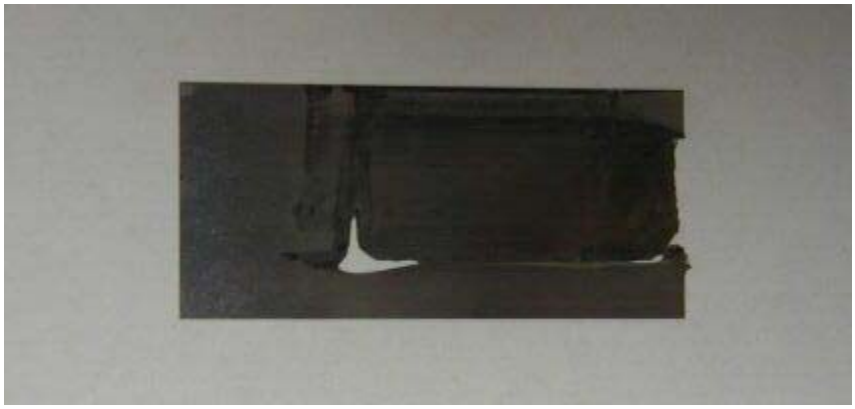
(similar to that used for plate-to-substrate contact) when asked how much doctor pressure to apply – just enough to meter excess ink and print a sharp dot or dense solid.

While ink contamination from doctor blade material is a common cause of scoring, other sources of metal and foreign material are often to blame and can be particularly difficult to track down. When chambered doctor blade systems are run outside of their intended life expectancy, parts of the chamber itself may come into contact with the anilox roll. When a doctor blade is run too long, it may become worn to such an extent that the blade retainers or holders will actually contact the anilox roll, damaging it within a short period of time. Also, as the blade is worn-down, other items within the chamber – such as auto wash up nozzles – can impact the anilox with disastrous results. Another drawback to infrequent chamber maintenance intervals can be dried ink build up within the chamber itself. As time progresses, excess ink begins to dry inside the chamber. Printing ink has an affinity for itself, so the build up will only worsen with time. Eventually, the dried ink will aggregate enough that – due to gravity or vibration – it will flake or drop off into the ink. The dried ink can be quite hard and can often contain metal particles from other sources. As the dried ink attempts to follow the fresh ink out of the chamber, it inevitably becomes trapped between the doctor blade and the anilox roll, causing a score line.

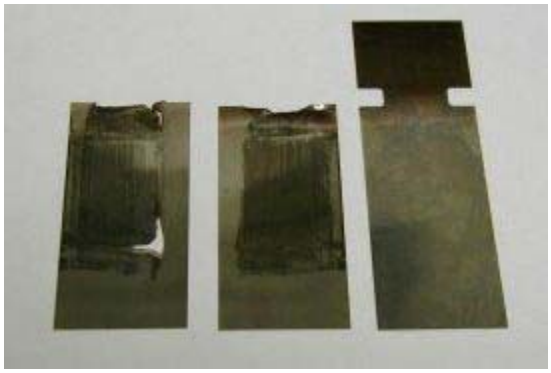
Anilox damaging metal can also come from rusting buckets or drums containing water-based ink systems. Therefore, any ink going to press should be strained or filtered before use. This is especially true if the container is low or almost empty, as rust and other contaminants will often settle to the bottom. Cheesecloth other inexpensive filter elements can be used to remove unwanted material prior to pouring ink into the pan or sump. Transferring ink from metal containers into plastic ones is also recommended to avoid additional rust formation in the future.

As more and more production facilities become automated, metal shavings from robotic forklift tracks can find their way into paper dust. The paper dust can then be picked up by corrugated sheets, which are on or close to the floor. As the sheets are drawn through the press, metal eventually ends up in the chamber or ink pan. Paper or film rolls can also transfer unwanted contaminants if rolled over a dirty pressroom floor. This situation can be alleviated by the proper use of sheet or web cleaning equipment, and there are many different types to choose from on the market. Another good justification for the use of a web cleaning system is other foreign materials that the web can introduce into the inking system. The substrate, whether it is paper or film, running through the press can transport chrome flaking off deteriorating idler rollers, so the web rollers should be inspected regularly and replaced if any signs of peeling are evident. The cleaning of chromed web rollers can also cause problems, especially if done while the press is running. Ink, adhesive or other roller build up should not be removed with metal or razor scraper type blade – these can chip or break, providing a high-speed source of unwanted metal to the anilox roll/doctor blade interface. Ideally, all idler roller cleaning should be done with the press off or idling, and any necessary scraping should be performed with a rigid plastic scraper. A plastic scraper will require a little extra effort, but is much safer for the anilox roll.

Another overlooked source of unwanted metal can be end seal shims. Similar to doctor blade material, these shims are used to prevent end seal leakage. If not inspected and changed regularly, they can cause significant scoring in a short period of time. If run too long, or run without sufficient lubrication, they tend to wear out quickly, and much of the material can end up in the doctor blade chamber.



Worn end-seal shim



End seal shims with various degrees of wear

Foreign material that causes scoring is often small and hard to detect; although this is not always the case. Larger items can and do cause anilox roll scoring, yet they are often overlooked. Press parts, such as bolts, screws, washers, nuts and pins are often left about when a print station or other press component is disassembled for maintenance or repair. During reassembly, many of these small items are misplaced or lost, and a replacement is found from the maintenance shop parts-bin. When the press is then started again, vibration from motors, pumps and gears dislodges the previously unseen pieces, which can then fall into the running press. A fifty-cent bolt, nut or washer can quickly score or even ruin an expensive anilox roll. An inexpensive solution to this potentially disastrous problem is a simple magnetic parts tray that can be affixed to the press, or even to each print station. Having a magnetic parts tray will not only prevent these small parts from dropping into the press, but can also greatly speed-up reassembly times – all the parts are right where they were last put.

As is common in the printing industry today, there are few – if any – "Magic Bullets" remaining that fix issues quickly and with little or no effort involved. Solving a costly problem in today's flexographic printing environment routinely requires a level of investigation and detective work to determine the real cause(s) of a problem. Hopefully, I have discussed a few sources of anilox roll scoring that otherwise would not have been considered.

About the Author:
Central Graphics Consultant for Harper Corporation of America, based out of Kansas City, MO. Thirteen years in the Flexographic industry.