Can you recall purchasing an anilox roll with engraving specifications requested by one of your operators? How about one for a new coating to meet a specific customer’s needs? Maybe, you have changed ink suppliers or decided on a different plate material since initial anilox specifications were chosen. The number of anilox rolls in inventory increases over time, and so does the variability. This variability can, and will, affect the bottom line.

Printers often ask for help in getting a handle on their anilox roll inventory. That immediately prompts a series of questions that address the most common indicators of an unmanaged anilox inventory. Specifically:

- How much of your overall press downtime is related to color matching at press?
- Is this time due to reformulating inks at press, swapping anilox rolls to achieve desired color strength or until you locate the roll with the least amount of damage to the surface?
- Do you have a way to check on your anilox condition?
- “Have any variables been changed?”
- “Which variables are under control?”

The problem may stem from a lack of documentation concerning current volume and overall condition of anilox rolls. For example; one might have a downtime code that encompasses too many potential variables. That said, step one is to get a handle on anilox condition. What does the anilox roll inventory look like? This can easily be answered with a roll audit that will determine the current/actual cell volume of each roll in inventory. Actual volume is what really matters, and is much more

Documentation of current condition and overall volume of an anilox roll is essential.

Photos: HarperGraphic Solutions.
Anilox Remanufacture Log

<table>
<thead>
<tr>
<th>Date Removed</th>
<th>Mfg. Date</th>
<th>Cust. Roll #</th>
<th>Mfg. Roll #</th>
<th>Press</th>
<th>CPI</th>
<th>Orig. Volume</th>
<th>Current Volume</th>
<th>OV / ETV %</th>
<th>Comments / Reason Roll Removed from Inv. (Be very Specific)</th>
<th>Possible Cause Determined</th>
<th>Action Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.02.11</td>
<td>08.15.06</td>
<td>75</td>
<td>25432</td>
<td>2</td>
<td>600</td>
<td>3.00</td>
<td>2.32</td>
<td>77%</td>
<td>unable to pull color</td>
<td>Wear. Roll approx 3.5 yrs old.</td>
<td>review audit results. Results show wide posts and walls.</td>
</tr>
<tr>
<td>02.10.11</td>
<td>06.12.09</td>
<td>26</td>
<td>36541</td>
<td>4</td>
<td>1000</td>
<td>1.80</td>
<td>1.72</td>
<td>96%</td>
<td>score lines</td>
<td>Excessive blade pressure. Contaminants in ink.</td>
<td>Conduct blade eval. Add filters and/or magnets. Training on proper blade installation.</td>
</tr>
<tr>
<td>02.11.11</td>
<td>05.22.09</td>
<td>45</td>
<td>35632</td>
<td>4</td>
<td>600</td>
<td>4.00</td>
<td>3.73</td>
<td>93%</td>
<td>score lines</td>
<td>Excessive blade pressure. Contaminants in ink.</td>
<td>Conduct blade eval. Add filters and/or magnets. Training on proper blade installation.</td>
</tr>
<tr>
<td>02.18.11</td>
<td>07.15.10</td>
<td>64</td>
<td>45672</td>
<td>4</td>
<td>800</td>
<td>3.00</td>
<td>2.82</td>
<td>94%</td>
<td>score lines</td>
<td>Excessive blade pressure. Contaminants in ink.</td>
<td>Conduct blade eval. Add filters and/or magnets. Training on proper blade installation.</td>
</tr>
<tr>
<td>03.12.11</td>
<td>04.06.10</td>
<td>52</td>
<td>43214</td>
<td>3</td>
<td>600</td>
<td>4.50</td>
<td>4.33</td>
<td>90%</td>
<td>numerous dings (impact damage) on drive side. All within 2 in. from roll end.</td>
<td>Print cylinder gear coming in contact w/ anilox surface during installation / removal.</td>
<td>Print cylinder gear coming in contact w/ anilox surface during installation / removal.</td>
</tr>
<tr>
<td>03.28.11</td>
<td>10.15.09</td>
<td>86</td>
<td>45952</td>
<td>3</td>
<td>600</td>
<td>3.00</td>
<td>2.82</td>
<td>94%</td>
<td>numerous dings (impact damage) on drive side. All within 2 in. from roll end.</td>
<td>Print cylinder gear coming in contact w/ anilox surface during installation / removal.</td>
<td>Print cylinder gear coming in contact w/ anilox surface during installation / removal.</td>
</tr>
</tbody>
</table>

useful to a press operator than the original stamped volume, as it recognizes the unavoidable volume loss caused by plugging of cells and wear to the roll surface over time.

An audit should include comments related to any physical damage to the engraved surface, such as: score lines, dings, scratches, chipped ends, blisters, etc… This data will not only be useful on the production floor but may identify need for additional training, highlight areas for improvement and assist with justification when budgeting for replacement rolls.

With advancements in plate and ink technologies, it’s possible for today’s printer to meet the high level of quality that customers demand with fewer anilox engravings. Print quality that once required seven different engravings, in many cases, can now be accomplished with four. Built on the foundation of known anilox volume and condition, the 60-degree hexagonal cell is still the preferred engraving to achieve the highest print quality based on trial after trial. That’s exactly why all anilox suppliers still offer it.

Keep in mind, any anilox standardization program must certainly offer consistent, repeatable, and reliable measurements. If you are unable to measure it, how can you expect to control it, and how do you know what you are getting?

**READING RESULTS**

Upon receipt of roll audit results, the information needs to be reviewed and also made available to operators. While reviewing the results, make note of which rolls are plugged and in need of a thorough cleaning; worn, with wide posts and walls or damaged, with visible score lines, dings, chipped ends, etc…

Thorough utilizing a hand-held 200 X or 400 X microscope, proper magnification of an anilox surface can be attained and an anilox roll can be easily viewed, thus making it possible for operators to verify condition and reduce the time spent troubleshooting on press.

With results in hand, printers must move out to avoid plugging of cells. This requires an evaluation of the effectiveness of current cleaning procedures. Steps must be taken to insure all cleaning instructions are followed. Also, if an off-line cleaning system is being used, printers must be sure it is working properly. They can refer to the manufacturer’s operation manual that recommends routine maintenance and then make sure it is performed by trained personnel.

In the case of worn or damaged rolls, they should be removed from inventory to avoid having damage to the surface of the roll reflected in the print. Damaged anilox rolls can be sent out for reconditioning/resurfacing.

Establish an ongoing system for continuously tracking damaged anilox rolls, rather than being dependent on an outside source to supply you with a report. By doing so, you will increase your chance of determining possible causes, so preventative measures can be put in place, resulting in less overall damage to inventory. (See chart).

When tracking anilox roll damage, include the following data:

- Press type or number—damage may only be seen on a specific press
- Type of damage: score lines, impact damage (dings, scuffs, chipped ends, etc...)  
- Location of damage—operator side, center, or drive side. Pictures may be helpful.
- Possible cause and preventative measures—include training or lack thereof: Awareness is key! Anyone who handles a roll has the potential to damage the roll it is very important that all parties involved understand the need for proper care and handling. To help paint the pic-
Sistemas Inelme Uses Laser Light to Conveniently Clean Anilox Rolls

Since 1996, Sistemas Inelme, has been leading the way in the design and advancement of auxiliary machinery for process measurement and control in the flexographic industry. From its widespread experience in the printing business, the Spanish company started identifying significant challenges facing flexographic printers. True to its commitment to clients over the years, Sistemas Inelme has developed a diverse portfolio of systems that improve the work of graphic arts professionals, including pH control systems, solvent mixers, aniline printer self-cleaning systems, anilox washing systems, ink dispensers, as well as video monitoring systems.

SILCL

In the early 2000s, Sistemas Inelme developed SILCL, a high-powered laser cleaning system, for maintaining anilox surfaces. This revolutionary technology is specifically designed to vaporize foreign particles, including ink, adhesives, waxes and silicon on anilox surfaces. SILCL is powerful enough to provide a deep clean to a variety of materials but does so without damaging the roller. This allows the cylinder to be cleaned after each use, extending service life. The laser also works fast, drastically reducing downtime. Less wait time between cleanings increases productivity and profitability. One can notice a difference after the first cleaning.

PRODUCT SAFETY

In 2007, Sistemas Inelme sought to prove the harmlessness of SILCL and enlisted the Technological Institute of Optics, Color and Imaging (AIDO) in Valencia, Spain for an independent review. After months of experimentation on numerous anilox materials, AIDO discovered that, even at the maximum setting and at a distance of only 5mm, SILCL does not ruin, damage or otherwise harm anilox material.

NUMEROUS BENEFITS

Another remarkable advantage the SILCL system offers is it is an environmentally friendly cleaning process. In today’s green world, customers are more concerned with the environmental impact of business. Rest assured SILCL does not generate any waste or pollutants and does not require any chemicals. A pneumatic dispersion nozzle dissolves particles from the surface while a powerful filter collects the excess. Through this method, SILCL is the only anilox cleaner capable of recovering almost the entire capacity of dirty cells.

The SILCL laser cleaning system also requires little maintenance costs. It does not require liquids, chemicals, special tools or waste removal. With SILCL, the only maintenance required is bulb replacement after every 500 hours of use.

With machines all around the world, Sistemas Inelme has become a prominent leader in the anilox cleaning business. The knowledge the company has developed over the years has made the systems more ergonomic, efficient and easy-to-use. SILC is a system that provides an innovated and highly efficient solution for a classic problem with anilox cylinders – how to clean them quickly, conveniently and efficiently.
ture, share the average cost per roll with your employees. It can be quite an eye opener.

• Scoring—when it is present, use of rare earth magnets, combined with some type of filtration to remove contaminants from the ink train is recommended. A main cause for score lines is over-impression of the doctor blades. Some reasons for over impression are leaking end seals, blade holds or chambers that are not aligned properly and dirty clamps that lead to wavy or uneven doctor blades.

• Impact damage—use of roll covers will help protect the surface of an anilox. I typically see covers being used solely for storage and transportation from the storage area to the press. When possible, use roll covers during installation/removal from press. This is where the majority of damage occurs. Discuss concerns with operators/helpers to see if there are other areas, where impact has occurred, that could be padded or rubberized, e.g. storage racks, hand rails, press frame, etc.

In addition to identifying which rolls are in need of replacement, due to wear and/or damage, this may be a good time to take steps to minimize the options and variability available to operators. Consider the range of anilox specifications needed for overall job mix and quality demands. Determine optimum cell count/volume combinations needed to achieve targeted SID (solid Ink density) and dot gain for process work, as well as desired color strength and overall coverage for spot color; plus coat weight required for OP varnishes or adhesion.

Tools available to ensure a scientific approach include banded anilox rolls, coating application worksheets and supplier involvement! Be sure to factor in any changes made to other components in the print package—printing plates, material, line screen, mounting tape, ink system, even ink supplier.

Involving the necessary individuals throughout this entire process, most importantly, the press operators. Their experience and knowledge can offer insightful suggestions and ideas when given the chance. They are the individuals that work with these components day-in and day-out. Operators know which rolls to go with when times get tough.

Finally, don’t stop with the anilox roll! Overall care and maintenance of all components and good housekeeping practices are needed to be successful. This includes, training and awareness, the correct tools, preventative maintenance, documentation, checklists, standard operating procedures, etc.

Develop a team to perform internal audits of said processes to ensure all are meeting expectations and reading from the same book in terms of components to be inspected, variables to be measured, equipment to be greased and press accessories to be replaced. The time has come to take a snapshot and put a plan in motion—a plan to minimize variables, improve efficiencies and increase profits. Believe me, your team will embrace the thought. Within a short time, all will see the results of working smarter, not harder.

About the Author: Bill Malm is the Midwest / West Coast technical graphics advisor for Harper Graphic-Solutions, a division of Harper Corporation of America. Prior to joining the Harper team, Malm had been in the narrow web printing industry for 14 years. During this time, he was involved in a number of process improvement teams, focusing on issues of corporate standards, color management, and setup reduction. He has run a variety of presses in the production of labels, multi web constructions, coupons, and games.