

## TECHNICAL REPORT

# Protecting Your Anilox Investment Getting Longer Life Out Of Your Anilox Rolls

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Let's say you have \$100,000 worth of anilox rolls in your plant. You want these rollers to last as long as they can to get your worth out of them. In reality, the majority of printers do not protect this investment. In fact, most printers take the components on the press that affect these rollers for granted. Through extensive research and development, we have determined that you can increase the life of your anilox rolls 50% or more if you implement an anilox protection program. But what is an anilox protection program? It should look something like what's illustrated in Fig. 1.

To start your anilox protection program based on Fig. 1, let's start with proper filtration of your inking system. I will share with you a case study that is the result of our research and development efforts.

Recently we tested an enclosed chamber system using water simulated as ink pumping out of a 5-gallon bucket. Within an hour of run time the water in the bucket had turned completely gray. We then took a rare earth magnet and installed it in the bucket. Within a matter of minutes, the water turned back to its clear form. What this proved was that if a magnet is not being used within an

inking system, the inks, plates, substrate, and the anilox roll will be affected. The amount of sludge and blade material that we took off of the magnet was an amazing sight.

Another good example of filtration is the motor in your car. Besides your house, a car will be the second biggest investment that you make. An oil filter near the motor filters out unwanted debris in the oil. It keeps your motor running efficiently and allows you to protect your investment to make it last as long as possible.

The first part of your anilox protection program should be the implementation of a filtration mechanism with a magnet attached. This is the start of keeping your inking system clean and eliminating many of the headaches that affected your anilox rolls and caused your printing to suffer.

Something as minor as a magnet and filter (see Fig. 2) can make all of the difference within the printing process. Eliminating the small variables that we sometimes take for granted can suddenly change the art of printing to a science.

### End seals

The next step to protecting your investment is to address your end seals within the enclosed chambered system. Again, we were amazed at what effect the end seals within an enclosed chambered system had on the anilox roll. Not only did we see rolls damaged due to inadequate end seals being used, but we also noted a tremendous amount of ink waste in the process.

This result, in particular, was some-

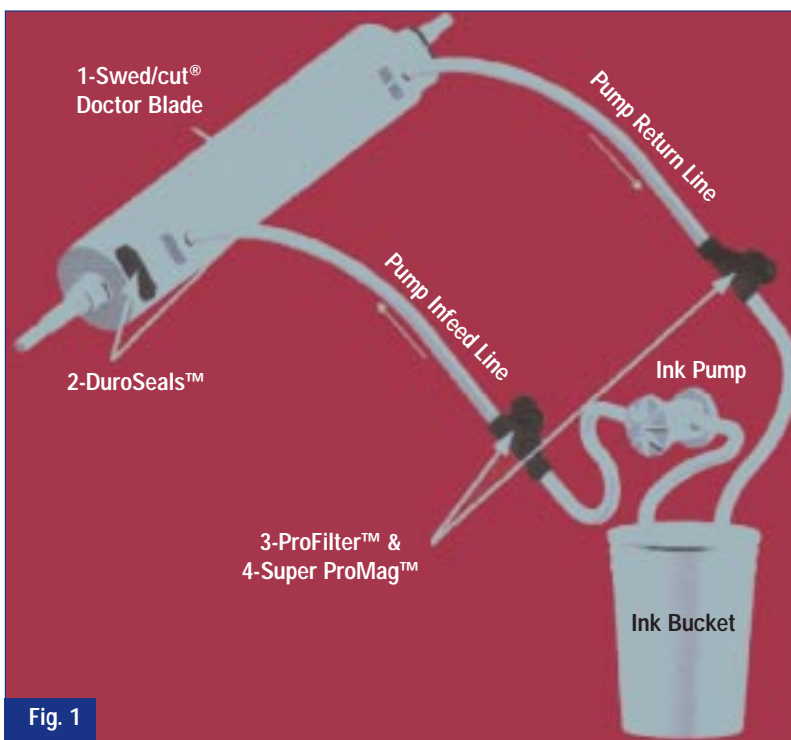


Fig. 1

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### Anilox rolls

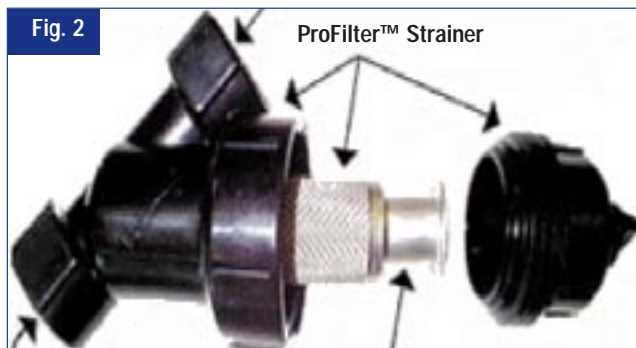


Fig. 2



Fig. 3

thing that we struggled with in our trials with the enclosed chambered system. As soon as we started metering the anilox, we were leaking excessively all over the ends of the press. We were unable to get a good seal on the end of the anilox and also noticed excessive blade pressure being caused to the anilox roll by the seals acting in a squeezing motion.

When we researched the seals being used in the industry, we couldn't believe the different type of materials being used. We tried foam, rubber, Styrofoam, cork, and felt to name a few.

Based on this research and testing, it became apparent that this was yet another item within the press that is sometimes taken for granted and can be the deciding factor between an anilox roll becoming damaged or not.

The fact of the matter is, you want a seal that will allow the doctor blade to seat properly. You do not want a seal that squeezes so much that your chambered system will fluctuate, whether it is air-loaded or

manual, causing excessive wear to the anilox roll or even possible circumferential score lines. The ultimate seal is a seal that contains the ink in the chamber, but also has minimal flexibility for the blade to seat properly.

We have found that an end seal with a dense compound at the base with a smooth radius adhered to it can reduce the coefficient of friction and is the best type of seal recommended for usage (see Fig. 3). The reduced ink waste and increased anilox roll life will play an important part in protecting your investment.

The final component of protecting your investment is the selection of a quality doctor blade within your chambered system. With the various types and sizes of doctor blades being used today, the different blade materials, blade tips, and other components, it sometimes seems like a guessing game. The doctor blade is the only reliable method of exactly controlling a precisely calculated ink film for the anilox roller to the plate; this is achieved by wiping or shearing the ink film. This makes it possible to transfer an even ink film onto the plate or plate cylinder, reducing the likelihood of ink variations especially

on long runs. A higher quality can be achieved throughout the whole print run.

Overpressure of the doctor blade, end seal leaking, and anilox score lines are the most common problems associated with doctor blade metering. The question that a printer must ask himself is, "I've got a million dollar press and a major investment in anilox rolls and ink. How can I reduce the vulnerability of waste, downtime, and damage to my anilox rolls?"

#### Not all steel is equal

As we continued our testing, we found out that the blade used determined how much blade material was collected on the filtration magnet. The objective was to acquire several different types of materials of blade and see which one wore the fastest, which one introduced the most blade material into the magnet, and which one was friendlier to the anilox roll. What we found out was that all steel is definitely not equal.

Steel is not always of the same quality, and cost savings using cheaper steel can prove more expensive in the long run. To determine why some of the blades wore faster than others and more material was introduced to the magnet with some, more than others, we sent out the various blades to a laboratory for comparison testing.

The microparticle size in the doctor blade actually determines how the blade will wear. The more microparti-

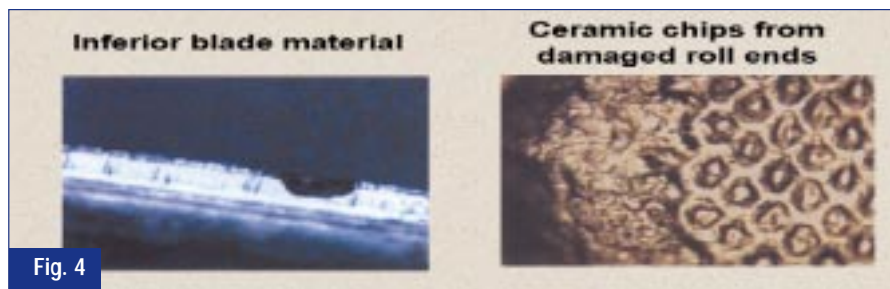
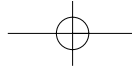
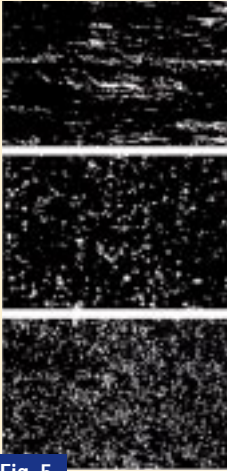


Fig. 4



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## Anilox rolls



**This steel has** linear structure and uneven distribution. It is likely to degrade and permit long slivers, hairs, and "curlicues" into the inking system and could damage the anilox, causing grinding lines.

**This steel has** particles that vary in size throughout the steel. Because the particles are so spread out, the larger particles can break off and possibly scratch the anilox roll.

**The particles in** this blade are very uniform and dense. It will wear evenly, last longer, and introduce minimal particles into the inking system. This type of blade would be characterized as a high quality steel structure.

**Fig. 5**

cles you have in the blade, the stronger and denser the blade is. The more microparticles you have, the less wear

you have, and the fewer particles circulate through the inking system. See Fig. 5 for the results of our testing.

To summarize, an anilox protection program can save you thousands of dollars, minimize waste and downtime, and keep your investment protected. As always, handling and maintenance of the anilox roll is an important part of protecting your investment. Keeping your anilox rolls clean and applying protective covers is always recommended. If you incorporate these important variables into your anilox program, you can guarantee yourself cost savings that can add up to tens of thousands of dollars over a very short period of time.

*Harper Corp. of America, Charlotte, NC, is a leading innovator in anilox roll production and restoration for wide and narrow web flexographic printing markets worldwide. The company can be reached at ph: (704) 588-3371 or by visiting [www.harperimage.com](http://www.harperimage.com). Circle 74.*

