Over the last 30 years, the flexographic industry has seen a tremendous change in the way we got to press. Flexographic presses have been on a nonstop technological journey and they show no signs of slowing down. The industry has evolved from a two-roller inking system utilizing chrome anilox rolls and rubber plates with machines that were driven by a helical-driven line shaft with eccentric register adjustments.

We then advanced to reverse-angle doctor blades utilizing ceramic anilox rolls and photopolymer plates. These machines were driven by oil-bathed gear boxes with manual register controls. Next, machines came with enclosed doctor blade systems, high-line high volume laser engraved ceramic anilox rolls and digital photopolymer plates. Driven by high tolerance, enclosed gear boxes with stepper motor register controls, the industry is now competing with any other print process. Now the servo automation age has arrived.

**THE MODERN PRESS**

Today’s presses offer enclosed blade systems with extreme laser-engraved ceramic anilox rolls, digitally engraved in-the-round photopolymer plates and driven by single, dual- and triple-axis servo automation. Standard features include PC-based automation, infinite repeats, auto and pre-registration systems, everything controlled with the touch of a finger including job recall and total process management. These new technologies have not only enhanced our entire process but have unlimited growth potential.

These new automated technologies have much to offer. They are designed to be more operator friendly and twice as productive. They are more environmentally friendly and leaner in production, which makes them much more suitable for a sustainable pressroom. There are no more oil baths to contend with, nor open gears to lubricate. Even the consumables have become environmentally conscious with the use of thermally processed photopolymer and water-soluble cleaning solutions. The presses are designed to consume less energy and produce significantly less waste. All leading to a reduction in the operations total carbon footprint. Older presses that utilized anilox and plate cylinder rolls with steel journals or shafts are now being replaced with sleeve technology.

Believe in it and Sleeve it

By Paul Teachout

Storage and handling is an important part of sleeve care.
DROPPING POUNDS

The advantages of sleeve technology benefit converter and press manufacturer alike. The press manufacturer can benefit from the lightweight nature of the sleeves to reduce the power consumption needed to stop and start the machine. The heavier the rollers, the bigger motor and drive needed. This only results in more cost to both the OEM and the converter. Most press manufacturers will specify the weight requirement of the sleeves, thus limiting the options for construction. The lighter the roll, the easier to handle. This also makes it easier to damage, though. Light weight also means there is a compromise in rigidity. A large portion of the sleeves weight is in the aluminum base. If this is too thin, you will compromise the rigidity and life expectancy of the sleeve.

The converter will benefit by having light-weight tooling that is safer to handle and more productive to use. Sleeve technology is one of the leading advancements on these new machines. Servo automation and sleeve technology now go hand in hand. They complement each other like salt and pepper. There is considerably less downtime during changeovers. Cylinders and rolls that used to take hours to change now take minutes, in some cases even seconds. The generation of the cost and downtime involved in replacing bearings and gear clusters is coming to an end.

A HANDLE ON HANDLING

There is an education process that needs to be considered as with any new technology. Anilox sleeves will require more attention than ever. They are more delicate than the old steel-core rolls and need more attention paid to care and maintenance. It is true that you will get less reconditions with an anilox sleeve than with the old steel cores. Traditionally you could get up to 30 recoverings with a steel core. With a sleeve you will get anywhere from three to six. But is this a major concern? More than 80 percent of anilox rolls that are reconditioned are done so due to damage, not wear. Ceramic is a very durable surface but it is also very brittle in nature. Rolls are returned with score lines from ink contamination and excessive blade pressure or chips and dings in the ceramic due to poor material handling practices or storage areas.

So, if we improve our material handling processes and implement protective coverings in our inventory areas, we will reduce the need for recovering thus increasing the life expectancy of the roll. As with any technology, the opportunity for continuous improvement exists. As more and more sleeved applications are finding their way to our pressrooms, so are the opportunities to improve the construction, reliability and recovering abilities of the sleeve base.

The lightweight nature of the sleeves will allow all personnel in the pressroom to now have the ability to maintain the inventory. Sleeve manufactures are continuing to develop new materials to reduce weight and increase life expectancy, but still have the rigidity needed to maintain the integrity of the sleeve. Care and maintenance are vital as well as implementing the proper storage techniques. I have always been a big fan of padding, any kind of padding. Anything in the anilox environment that can be padded should be. Foam padding, pressure sensitive weather stripping and BMX padding can be used to protect your investment on sinks, work benches and especially roll racks.

Always limit the possibility to chip an end or ding a face—one of the most common causes of recovering. The cost of one recovering would probably pay to pad all your storage and service areas. With sleeved anilox rolls, you will also need to pay as much attention to the inner diameter as you do with the outer ceramic diameter. The compressible layer inside the sleeve diameter is what allows the sleeve to be pneumatically installed onto the press mandrel. This layer is similar to cushion back plate mounting tape. If compressed too long in one position it will create a flat spot that could cause TIR (total indicated runout) issues during operation.

CLEAN AS A WHISTLE

Ink or solvent contamination of the inner diameter can also cause on press concerns. This could result in sleeves getting stuck on the press mandrel and effect concentricity of the roll. Poor storage techniques and contamination are usually the main areas of concern. Do not store your anilox or plate sleeves on small diameter pins that will allow the weight of the sleeve to compress the inner layer.
Increase the diameter of the pin with padding to eliminate the possibility of damage. Vertical storage racks are also available and highly recommended. These will store the sleeves without having pressure on the ID or the OD.

Good housekeeping practices are always the most efficient way to protect your investment. Maintaining a clean inventory of rollers will increase production and decrease costs involved with downtime and recovering rollers. There are many brands of anilox cleaning equipment now available from the traditional ultra sonic units, media blasters and now the pressure wash systems. All can be very effective if the proper level of cleaning is applied to the level of technology you reproduce.

As with any level of cleaning system, proper operating procedures must be followed to protect the anilox sleeve. Utilize proper end seals and rings that will eliminate the possibility of cleaning media or solutions to enter the inner diameter of the sleeve. This contamination could result in delaminating of the sleeves inner layers and difficulty in installing and removing from the press mandrel. Be very careful of the corrosive and caustic levels of the solutions used. If the inner layers are penetrated they could show signs of swelling or corrosion of the aluminum base. The result of the aluminum corrosion could be seen as small blisters on the roll face where the ceramic has been lifted from the base material. This can also happen to journal rollers as well if allowed to sit idle in these environments. Always wipe the rollers with a mixture of alcohol and water after cleaning to evaporate and remove any excess solvents from the cleaning process.

YOU GOTTA BELIEVE

Most future press designs will implement some sort of servo automation technology. Plate roll and anilox sleeves will only complement these new innovative designs. Presses from 10in. to 100in. wide will benefit from this opportunity. An educated converter will take advantage of these advancements. Education on the care and maintenance and storage techniques will create a safer work environment with less damage concerns and a more efficient and profitable pressroom. By implementing these processes sleeve technology will create a more lean and safe working environment.

These new technologies have a lot to offer, so don’t be afraid to jump in. The water is fine once you get used to it. Sleeves and servo automation are not a fad. They are here to stay and they will bring our process to an all time high. Learn as much as you can about the advantages and implement the proper processes. Believe in it, and sleeve it!

ABOUT THE AUTHOR: Paul Teachout has been in the packaging industry for more than 25 years. Starting out in offset, he moved to flexo press manufacturing with Webtron in 1986. He remained with the company through its evolution to finally become Aquaflex. Teachout has held numerous key positions including printing management, application specialists, sales support, engineering support, marketing and product development manager. In March 2008, he became the southeast technical graphics advisor for Harper Corporation of America. He is also active on industry committees and is a contributor of numerous technical articles.