Safe & Spotless

How to Clean Anilox Rolls & Understanding the Chemicals Involved

Alan Rogers

It’s time to clean your anilox roll as you prepare for your next job. You go to your work station and see several bottles of cleaners. You try one and you do not see good results. You reach for another and, this time, you spray an abundant amount of cleaner on the roll. The results are better, but not to your satisfaction, so you grab another bottle. After several minutes of scrubbing, you finally have a clean roll.

But to what extent? And to what expense?

There are thousands of different cleaners on the market, each with different formulas and ingredients. Some manufacturers formulate for specific applications, such as anilox rolls or printing plates. Many chemical companies market cleaners that are great for dissolving ink, grime, grease and removing stains. Other companies manufacture multi-purpose cleaners, advertising their products are great for any and all applications.

If your job is to clean anilox rolls, how do you know which cleaner is the correct one, specifically to clean while not damaging?

KNOW YOUR MAKE

Before you apply any chemical to your anilox roll, it is important to understand its makeup and to review any chemical’s Safety Data Sheets. As a printer, you are always taught to protect the ceramic coating of your anilox roll and to prevent chips, dings and scratches. However, it is just as important to protect the base or core. Many anilox rolls are made of steel bases, which can be quite heavy. To

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Prevent plugged cells (seen on the left) by keeping your aniloxes clean. When in press, keep ink circulating to prevent it from drying in the cells. Photos courtesy of Harper Corporation of America
combat the weight issue, anilox companies are making lighter bases by substituting aluminum. If you are using anilox sleeves, these products are made from various composites encased by an aluminum cladding.

It is very important to know the material from which your anilox is made, as different cleaners can cause damage or corrosion to the base. That’s true of mild steel or aluminum, the composites or the cladding. More importantly, you should know what chemicals in different cleaners can cause damage to your anilox rolls, especially those made from aluminum. Look for cleaners that state “aluminum safe.”

Anilox rolls are made by spraying a ceramic coating to the base and then laser engraving to form cells. This coating, although hard and durable, has a certain amount of porosity by nature that allows for liquids to eventually penetrate to the core. The higher the porosity in a ceramic coating, the faster this penetration occurs. Therefore, it is extremely important to rinse immediately after cleaning a roll and not allow cleaners to soak on the ceramic over a long period of time. This helps prevent the liquid penetration from attacking your base.

**SODIUM HYDROXIDE**

Sodium hydroxide is used in many industries, mostly as a strong chemical base in the manufacture of soaps and detergents. Sodium hydroxide is very alkaline (high pH) and is soluble in water, ethanol and methanol. For these reasons, it is a very common ingredient found in many cleaners in the printing industry. The high pH dissolves water-based inks, cleans dirt and grime, and is very aggressive.

However, it can also attack aluminum and cause corrosion to your anilox roll. Sodium hydroxide reacts with aluminum and water to release hydrogen gas. In this reaction, sodium hydroxide acts as an agent to make the solution alkaline, in which aluminum can dissolve. If you are using a cleaner with sodium hydroxide to dissolve your dried inks, you may also be dissolving your anilox base or core, especially in sleeves. These types of cleaners should be handled with extreme care and rinsed immediately.

If you have ever experienced a “blistered” anilox roll, chances are you may have used a sodium hydroxide-based cleaner and did not rinse properly. This bears repeating: When using chemicals with sodium hydroxide, you must rinse thoroughly!

Sodium hydroxide is the chemical name; however, it may be listed under a different name on the label of your cleaner. The most common synonyms are: aetznatron, ascarite, caustic soda, collo-tapetta, fuers rohr, hydroxide de sodium, natrium causticum, collo-grillrein, natriumhydroxid, natriumhydroxyde, plung, rohrpitz, rohrreiniger rofix, sodium hydrate, (Na$_2$(OH)$_2$), white caustic and (Na(OH)).

**POTASSIUM HYDROXIDE**

Potassium hydroxide is another chemical you may want to verify as an ingredient in your cleaner. Potassium hydroxide is an inorganic compound and is commonly called caustic potash. Along with sodium hydroxide, this colorless solid is a prototypical strong base. It has many industrial applications, most of which exploit its corrosive nature and its reactivity toward acids.

“Successful chemical cleaning should be considered a science rather than just a maintenance procedure.”
Potassium hydroxide solutions with concentrations of 0.05 percent to 2.0 percent are irritating when coming into contact with the skin, while concentrations greater than 2 percent are corrosive. For these reasons, safety glasses and gloves should always be worn when using press-side cleaners. In addition, a thorough rinse of the anilox roll should always be standard practice when using these types of cleaners.

Five steps to a good cleaning are as follows:

• Clean thoroughly with a recommended cleaner
• Rinse
• Rinse
• Rinse
• Dry thoroughly

Synonyms for potassium hydroxide include caustic potash, lye, potassium hydrate and (K(OH)).

These are just examples of chemicals all printers should be aware of prior to cleaning their anilox rolls. There are many aluminum-safe options in the marketplace that do an excellent job of cleaning rolls while protecting the integrity of your engravings, your base and your skin. Look for “aluminum safe” on the label to ensure you are using one of these safe cleaners.

10 TIPS FOR ANILOX ROLL CARE & MAINTENANCE

The use of safe cleaners is just one aspect of maintaining your anilox inventory. Every printer should implement a care and maintenance program geared toward the cleaning, protection, storage and handling practices of their anilox inventory.

These 10 tips are recommended to protect your anilox roll investment:

• **Incoming inspection:** Inspect the box/crate to ensure no damage has occurred during transit. Should damage be visible, notify the carrier immediately to establish liability
• **Handle carefully:** Remove the roll from the box/crate, and unwrap and inspect it. Handle with care. Any ding, dent or scratch could destroy the engraved cells and affect your print quality
• **Protect your investment:** Always lift the anilox roll with both hands or use a hoist. Do not drag the anilox roll off or across the table or floor, as you risk damaging the engraved cells. When not in use, use a protective cover to avoid damage
• **Keep circulating:** When in press, ink should always be circulating and the anilox rotating when not in use. This prevents ink from drying in the cells
• **Doctor blade applications:** Disengage the doctor blade from the anilox roll during color changes to make sure there is no ink buildup. Always use filters and magnets if you are using doctor blades—These will help prevent scoring
• **Keep clean:** In a perfect world, the anilox should be cleaned at the end of every job. This should be the daily routine of every press operator. A stainless-steel brush should be used on ceramic anilox rolls. Do not use brass brushes on ceramic. Always brush in a circular motion with a safe cleaner
• **Watch the pH:** Do not use any cleaner on your anilox that is highly caustic or acidic. Blistering or delamination of the ceramic
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may result. The acceptable pH range of a cleaner is 6.5-11.8

- **Know what you are using:** Aluminum-base cores are more susceptible to corrosion and should be cleaned with a mild chemical or mechanical cleaning procedure.

- **Anilox sleeves:** Use “aluminum safe” cleaners on all anilox sleeves. Keep the insides (bores) and ends of sleeves clean. No dried ink. Keep sling guards clean and free of dried ink to prevent grinding and damage to the ends. Do not allow chemicals or cleaners to contact the internal composites. This can also lead to delamination of the ceramic. Use caution and protective end caps when cleaning in chemical bath tanks. Do not allow the temperature above 120 degrees Fahrenheit when using chemical bath tanks.

- **Post-cleaning practices:** Always thoroughly rinse and dry the anilox surface and ends of the ceramic. Flash off any residual chemicals or water with an alcohol wipe or “anilox surface cleaner.” When using compressed air to dry, be sure the line is oil-free.

These are great tips to follow when setting up your anilox roll care and maintenance program. It is also recommended to train your staff on the proper cleaning and handling techniques. This is important so everyone has a full understanding of the effects of improper chemicals and not only how they may cause harm to the anilox roll, but also for personal safety.

It bears repeating that safety glasses and gloves should always be used when handling chemicals and cleaners. The health and safety of your employees should be your first and foremost concern. EPA and OSHA issues must be addressed and Safety Data Sheets should be reviewed with all personnel handling these cleaners. Successful chemical cleaning should be considered a science rather than just a maintenance procedure.

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**About the Author:** Alan Rogers is currently the vice president of sales for Harper Corporation of America, overseeing anilox sales for the U.S., Canada and Europe. Alan has more than 20 years’ experience in the printing industry, in both inks and anilox rolls. Prior to Harper, Alan was the national sales manager for Arcar Graphics, Waterbase Inks and Coatings, out of West Chicago, IL. Alan graduated with a degree in industrial management from Georgia Tech, where he also played college football. Alan began his career with Harper in 2004 as the technical account manager for the Southeast for wide web printers and converters.