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Pressroom Tips to eliminate IPA

With the introduction of our alcohol free founts that contain viscosity builders and low surface tension wetters we feel some of the following comments may be pertinent to achieve improved results when demonstrating.

The challenge is knowing how to run well without IPA. The metering roller is a critical component in the alcohol-free equation, and metering roller variables impact successful dampening. These variables, including surface graining, can be applied to problems routinely seen during the transition to alcohol-free pressrooms.Lithography, of course, is an ink and water system. "Refinement tools" are available to help control that system when alcohol is removed. These tools include:

* Human craftsmanship and commitment. Many believe craftsmanship is disappearing from our trade. Not only do we differ on that score, we also suggest our industry can't let it vanish. The human element is critical--without it, the chance of success is greatly reduced.

* Maintenance. The future without alcohol will mean a leaner ink/water balance. Printing with a reduced ink film thickness will require rollers to efficiently transfer or split ink. The smaller operating window created by IPA elimination will require a more consistent program of ink and water roller maintenance.Care for the condition of chrome or ceramic pan and transfer rollers also is an important part of this maintenance.

* Metering roller. A metering roller typically isn't the make-or-break variable when it comes to running alcohol-free. That doesn't mean a particular metering roller can't make a difference--it can. But, in most cases it's a refinement tool to help an already working ink and water combination work better.

The moral of the story is that numerous products must work in harmony with one another. So you eliminate alcohol from the equation. What happens? Changes in fountain solution are well-documented.

Previous fountain solutions made the surface tension increases, meaning the water was more prone to beading than filming. Now with Beyond 2005 /6 the surface tension is the same as with alcohol.

Previously with alcohol free fountain solutions viscosity decreased. Alcohol significantly affects the viscosity of the fountain solution; without it, the solution is thinner or less viscous.With B2005/6 being viscous the problems that used to lead to fundamental operating problems on the press are greatly reduced, i.e. banding, lining, water/metering roller streaking--fine light and dark streaks around the cylinder. While these streaks can occur at any time, they tend to show up on solids and often when special colours are being used.

Also, increased dampener/ potentiometer speeds could result from alcohol elimination. These higher speeds reduce control; even more excessive speeds create dramatic problems, such as slinging or splashing.Because of the viscosity control the metering roller is easier to control.

When using the metering roller to solve any difficulties, consider several roller variables:

* Compound or chemical makeup of the roll covering,

* Durometer of the roll covering and its related compression characteristics; and

* Surface graining, which relates to the actual finish of the roller's surface. It's quite different from a traditional polished surface. To understand surface graining and what it can do, we must understand where it fits with respect to compound and durometer variables.To address the first variable, roller compounds vary widely and numerous different elastomers are available. These materials offer various physical and surface characteristics, chemical resistances, colours and hardnesses.

With respect to issues of dampening control , the real challenge for the metering roll compound translates into how readily the water will wet or film on the roll's surface.This represents a challenge since most roller compounds are inherently oleophilic--most are ink-loving, meaning the material has tack. Tack refers to the roller exhibiting a great deal of surface tension. This surface tension prohibits the fountain solution from "spreading" on the roller surface, thereby adding to the banding problem.Regarding water receptivity, one potential misconception may need explanation is the belief that softer rollers are more water-receptive. Generally, the opposite is true. Rubber rollers are softened by increasing the level of plasticizers in the formula. These oils actually make lower durometer rollers more ink-loving. This factor alone has motivated the roller industry to research new compounds.

The alternative to oleophilic compounds is hydrophilic, or water-loving, types. Making roller compounds more water-receptive has been the challenge, and new developments exist in this area. Formulas are changing, and today new compounds are available that promise to enhance or improve wetting characteristics of a basically ink-loving material. Rollers produced with these compounds exhibit less surface tension; reduced surface tension will help minimize the incidence of banding.

Durometer is linked closely to compound variables. There has been a long-standing recommendation for a lower durometer/softer compression metering roller. Those considering eliminating IPA should heed this recommendation. Specifications generally have been reduced from 25 to 30 to 18 to 22 durometer on the A scale.

The durometer/compression of the metering roller relates to fountain solution viscosity and dampener speeds, but how? Consider the case of the high durometer metering roller. A higher viscosity fluid is more able to displace the rubber in the nip, or push its way through. The amount of moisture passing through the nip is increased, Note the current potentiometer speed.

What if the higher viscosity fluid is replaced with a lower viscosity fluid (fountain solution without alcohol)? The setting stripe of the metering roller is unchanged. This fountain solution meets the same nip pressure only to find it isn't strong enough or viscous enough to move the rubber out of the way and get through. Beyond 2005/6 should eliminate this problem. Sufficient moisture should still pass through the nip,. The remaining amount of fluid is turned away from the nip. If the press is operating with an inadequate amount of moisture. To obtain the needed moisture, metering roller speed must be increased, By turning faster with less water carried per revolution, the same quantity of moisture can be brought to the plate as the amount brought with the slower turning system or a higher viscosity fluid.

Now, the hard metering roller is replaced by a soft, low durometer roll, The setting, as measured by a stripe, isn't changed. By lowering the metering roller's durometer or the compression, actual pressure in the nip is reduced even though the press setting remains unchanged. According to the viscosity of the fountain solution it forces its way through the nip. Therefore, the more viscous the fount is the more water can pass through the nip per revolution. Required moisture levels can be brought up using slower potentiometer speeds.

Such reduced potentiometer speeds enhance operators' control over critical water balance by "opening the window"--giving operators a broader speed range with which to work, while avoiding the high end. Splashing and slinging are minimized or eliminated.We've seen how lower durometer contributes to reduced dampener speeds.

A second benefit is that the lower durometer or softer compression metering roller provides operators greater adjustment latitude on press.

As settings are adjusted, there's a more gradual response in the flow of water through the nip. Instead of going from a flood to a starvation condition with a slight change in pressure setting, the softer material provides a more gradual response in the flow of water through the nip. Water can be metered up or down more gradually. These facts "open the window" in the idle range of potentiometer speeds.

Finally, we can move to surface graining of the metering roller.A metering roller with a grained surface is a tool by itself.

Graining complements the roller compound to minimize effects of surface tension. The grained surface provides a type of capillary action that helps the water to film or spread, rather than bead. This action is similar to that of a grained plate. By counteracting effects of surface tension, graining promotes good fountain solution spreading. Force number one is the surface energy of the grained roller. It pulls out on the water, helping it to film. The capillary action created by the surface grain provides the force that promotes improved spreading.

When fountain solution spreads more readily due to the surface tension agent in use it spreads evenly on the metering roller's surface, and banding problems are reduced.The grain's peaks and valleys also give the metering roller increased surface area. This greater surface area complements on-press durometer and compression variables since it allows the roller to carry more water on its surface and through the nip at a given setting--regardless of durometer. Carrying more water helps operators reduce and control dampener/potentiometer speeds. It further provides even more latitude above and beyond durometer when setting roller pressures.

Surface graining may be a short-term tool to give operators an immediate margin of control over water balance during early "learning" days without alcohol, or while evaluating different products--usually fountain solutions.However, surface graining can be the long-term solution well after press operators have achieved success in running without alcohol.

Finally, surface graining works with compound and durometer to minimize dampening problems. Utilizing any one variable or a combination of these variables may provide the key to dampening control in your pressroom. Such control is critical in achieving the goal of a consistent ink/water balance.

I hope this article is of use to explain the principles of printing without alcohol in the pressroom.