TIPS AND TRICKS

Dampening Solutions in Offset Printing

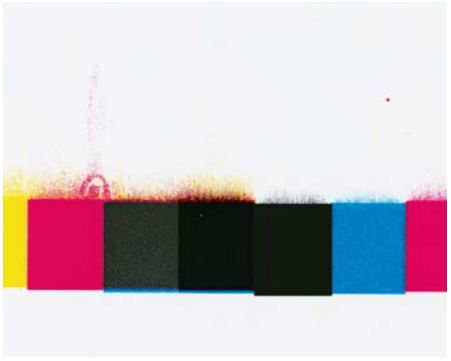
PURITY IS ALL-IMPORTANT // For centuries, the "Purity law" has ensured the outstanding quality of German beer. In the world of offset printing, a similar "law" should also be introduced for dampening solutions – particularly for alcohol-reduced and alcohol-free printing.

The influence of dampening solutions on printing quality is often underestimated. It plays a crucial role alongside the printing plate, blanket and ink. Only after all of these components work in perfect harmony can optimum results be achieved. It therefore stands to reason that due care should be exercised when "brewing" dampening solutions – especially with alcohol-reduced and alcohol-free printing.

The process water usually originates from the water tap. Tap water with a consistent hardness level of between 8 dGH and 12 dGH (or around 1.5 – 2.5 millimoles of calcium carbonate per liter) is ideal. If these values are not achieved, the water will need to be treated. The most effective way of doing this is to use a reverse osmosis system that first desalinates the tap water before "re-hardening" it to the precise level required. It is nonetheless worth keeping a constant eye on the hardness level using, for example, test strips. In printing, overly soft water often leads to emulsification and excessively hard water to lime deposits that can damage ink rollers and blankets.

In addition to the level of hardness, the pH value of process water is also significant. If the water is too acidic, the drying process is protracted. If it is too alkaline, this can have an adverse effect on the clean running of the plate. This can be counteracted by using dampening solution additives. When used correctly, these ensure a constant pH value of between 4.8 and 5.3. This "window" has proven to provide the best balance between advantages and disadvantages.

The alcohol isopropanol (IPA) is often used to increase the wetting speed and flowability of the dampening solution. Normally, it represents 8 to 10 percent of the dampening solution. A percentage volume of 3 to 5 percent is recommended for alcohol-reduced, and thus low-emission, printing. The IPA content can be determined using, for example, the Alcosmart measuring unit in the CombiStar. It is important to note that less alcohol means higher surface tension and lower viscosity. In other words, for the same dampening system setting, less dampening solution reaches the printing plate than is the case with higher IPA concentrations. This means to compensate for this situation, the speed of the water pan roller must be increased. The extent to which it must be increased can be determined using a special inking unit and dampening solution test form from Heidelberg.



"Smudging": This can be caused by dampening solution that is either soiled or available in insufficient quantities.

The quality of the dampening solution itself can be tested using a universal testing device. In addition to pH value and temperature, these devices often measure the conductivity, which provides information on impurities, etc. As a rough guide, as soon as the conductivity exceeds the measurement of the "fresh" dampening solution by around 800 microsiemens per centimeter, it is time to think about changing it. If you miss the window, you may notice the plate running together during printing and instinctively increase the water supply. However, this only results in the dampening solution being soiled by residual paper or ink being pushed over the limit at some point. It will then no longer be possible to maintain a stable emulsion in the printing process. The consequences are similar if the temperature of the dampening solution is too high. The temperature should be maintained at between 10 and 14 degrees Celsius.

Peripherals from Heidelberg help to keep track of all these parameters. What's more, the CombiStar and FilterStar are true "guardians of the purity law." They ensure clean dampening solution over long periods with no need to change it. Thanks to their more consistent ink-water balance, they greatly facilitate alcohol-reduced and alcohol-free printing – above all in conjunction with certified dampening solution additives from the Saphira products portfolio from Heidelberg. The FOGRA list contains all suitable Saphira dampening solution additives. ■

Info

The products described may not be available in all markets. Further information is available from your local Heidelberg representative.