ACTEGA Kelstar Technical Bulletin
Buffer Systems

Buffers and Conductivity

This is probably one of the most important but least clearly understood issues of fountain solutions. Most commercial sheet fed and web founts are mild acids, with a press ready pH between 3.8 and 4.5. This pH range provides a mild acid etching to keep the non image area of aluminum plates clean and water receptive. If the circulator pH keeps rising, this cleaning decreases and the plates may not stay hydrophilic.

•**Buffer –** This is a chemical property of mild acid solutions to resist changes in pH. pH drift will be affected by dosage, water alkalinity, or contamination from paper and ink. Buffer strength is also set by the buffer acids used and the dosage. Ideally, the best buffer systems will not drift, but also not react with calcium to blind or strip rollers. Strong buffer systems are desirable to keep the fount stable in the circulator.

•**Conductivity –** Dissolved salts and acid ions can carry electric current which is referred to as the conductivity of a solution. Conductivity varies depending on what ions are present and dose. More ions = higher conductivity. Because conductivity and concentration are proportional, this provides a simple tool to measure dose. Conductivity meters are rugged and well suited to pressroom use unlike pH meters that are fussy and better suited to the lab!

•**Conductivity is Not Additive** – When you mix founts in hard water, the conductivity will be lower than expected. If the water is 800, the fount 2,000 (5 oz x 400), you expect 2,800 but only get 2,300. What happened to the 500? No problem with the batch, only a simple reaction. The hard water ions, calcium and magnesium have reacted with the acid ions of the buffer. When they join they no longer conduct so the conductivity will be low. Always make a test batch to be sure.

•**Conductivity, IPA and Sub –** Alcohol suppresses the rise in conductivity from founts. If you mix 3 ozs. of fount and read 1,800 mmhos, then added 10% IPA, the conductivity drops to 1,500. Chemically, the alcohol suppresses ionization lower conductivity. Replacements may lower conductivity, by less than 100.

•**Tracking Conductivity** also provides a handy tool to track contamination. If the fount picks up paper coating or calcium from the ink, the conductivity will rise. Tanks should be dumped when conductivity rises 1,000 mmhos. This is a general limit before contamination effects the plates and print quality.

Measuring pH, Conductivity and Sub

•**Conductivity Meters** – There are many types of meters available, but the Myron L models are rugged and more than accurate enough for pressroom use. The compact inexpensive pen types do not always provide accurate results. It is good to regularly calibrate your meter.

•**Measuring pH** – There are meters and strips. A good portable meter costs several hundred dollars and must be calibrated daily to be accurate. Strips are less sensitive, but can easily show differences between 4.0 and 4.4. Strips always work and won't break!

•**Measuring Dose of Sub** – This regularly causes problems for printers. Too little, you get high dials and dry ups. Too much and the ink breaks down. The best way is to send a small sample to the lab for Index of Refraction testing! This is very accurate and will measure to +/- 0.25 oz. It only takes 5 minutes, so send them in! Mixing the fount accurately prevents problems and keeps the printing process in control.

•**Contact ACTEGA Kelstar** at 856 829 6300 or info.actega.kelstar@altana.com for additional information or technical assistance.