

Measurement of pH and Conductivity in the Printing Industry

In offset printing, one of the prominent branches of printing, fountain solution is prone to variation. While the cause and nature of these variations seem complicated, controlling them is relatively simple.

pH is used in the press-room as a means of aiding in fountain solution control. Conductivity measurement is used as a factor in fine tuning the fountain solution mixture.

Most fountain solutions contain four basic ingredients, each serving a specific purpose in the offset process. The acid in the fountain solution is to reduce the pH, keeping the plate image area sensitive to ink and the background area sensitive to water. The wetting agent in the fountain is to lower the surface tension of the water, allowing it to maintain the wetting characteristics of the non-printing areas of the plate. By reducing the amount of water necessary to keep the plate clean, they also reduce the amount of ink required. Plate conditioners in fountain solutions serves to minimize the corrosive action of the acid on the aluminum. This will extend plate life and improve overall print quality. The gum in the fountain solution is to adhere to the plate's non-image area to protect it from accepting ink. Gum also protects plate from humidity and chemical attacks during press stop.

One important factor in preparing fountain solution is the quality of dissolved ingredients in the solution. Conductivity measurement permits adjusting and monitoring the level of dissolved ingredients. When adding a buffered acid concentrate to prepare fountain solution, the pH will drop to a certain level and then plateau at that level, regardless of how much buffer concentrate is added. But the addition of concentrate raises the conductivity reading. If only pH is monitored, optimum solution concentration may be exceeded.

In preparing fountain solution, the manufacturer's mixing directions should be followed. Most concentrates are formulated to produce a working fountain solution with a **pH of between 3.5 and 5.0 and conductivity range of 800 to 1500 μ S**. For optimum results, fountain pH/Conductivity should remain constant from day to day.

Excerpt from Australian Printer Magazine (Dec. 1990)

Recommendations

Eutech's [pHScan WP1/2](#) series for testing the pH value and [ECScan Series](#) or [TDScan 10](#) to test the Conductivity of the fountain solution.