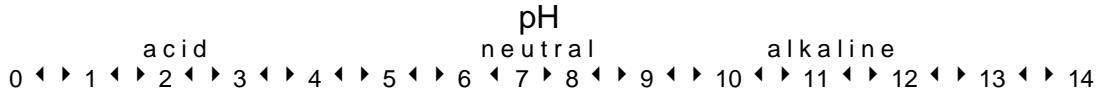


HISTORY» CHANGE » PROBLEM » SOLUTIONS » BASIC KNOWLEDGE

HISTORY

Paper has undergone a manufacturing transformation from using acid to alkaline chemistry.



WHY? With the acid system of paper manufacturing, elemental chlorine bleach was one of the processes used to brighten the wood fiber. This process created pollution problems in the process water discharge from paper mills.

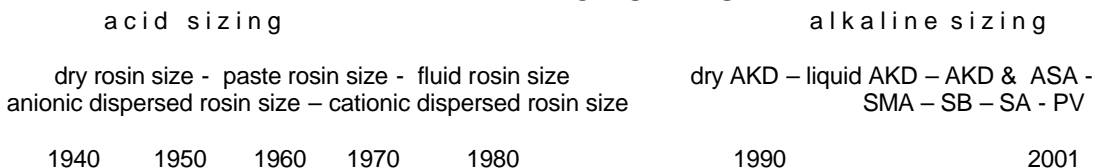
WHY ALKALINE? Filler can be introduced into the manufacturing process as a brightener, fiber alternative, & over-all per ton cost reduction. The fillers are calcium carbonate and precipitated calcium carbonate (PCC is less abrasive and puffed up).

WHEN DID THIS START? 10 to 20 years ago.

WHAT IS SIZING: Substances or coatings added or applied to paper to increase its resistance to liquids, (water-fountain solution, minor amounts of water in ink, changes in relative humidity the paper will under go) and ultimately improve the paper surface and paper stability. In acid formed papers the sizing was called "acid rosin sizing" similar to a starch applied to a shirt when pressing.

DID SIZING CHANGE WITH THE CHANGE TO ALKALINE FORMED PAPERS? Yes, due to the word "acid", remember your basic chemistry, acid and alkaline do not mix well. To use calcium carbonate and PCC filler you need alkaline paper making chemistry. When you have alkaline paper making chemistry you need to change to neutral or alkaline sizing chemistry.

TIME LINE OF CHANGE



PROBLEM

PRESS RELATED: Calcium carbonate, PCC, styrene maleic anhydrides (SMA), polyvinyl (PV), alkenyl succinic anhydride (ASA), alkyl ketene dimmer (AKD) & others are far more efficient at holding water out of the paper fiber especially when compared to the acid rosin sized wood fiber sheets. Secondly, in essence displacing wood fiber with small molecular size fillers decreases certain paper strength properties. Thirdly, if calcium carbonate, PCC, sizing and some paper binders (binders help hold the wood fiber, moisture and filler together) get loose from the sheet for whatever reason, press problems can develop.

We now know that most alkaline papers have superior water resistance so change is necessary. Over packing the plate and blanket cylinders beyond factory specifications can eject the water from the ink/water emulsion (water is not compressible) and cause toning, ink piling, uneven water distribution, high potentiometer settings, registration problems, shorten blanket and plate life, and increase the likelihood that filler, sizing, and binders will continue to contaminate your press. It is fine to use "permanent" packing under the plate but not under the blanket. When you pack a blanket, pack it with at least two papers. Example: your blanket undercut is .075, press specifications are .004 over, your blanket is .068, and so you need to pack .011 to be .004 over. Use two papers to total the .011 and your blanket life, print quality, registration, and ink water balance stability will improve. Adding ethylene glycol as a non-piling additive is not the solution and will add additional undesirable variables to the print process, your environment, and your health.

High tack inks with additional dryer content and low boiling rate solvents are not always stable and tend to increase the force necessary to split the ink as it travels from ink ball to ductor - rollers - plate and blanket. The shear force at the print line or blanket to paper is where again you can create contamination of filler, sizing, and binders into the press units. Ink film thickness is the key to lower dot gain, better contrast, open reverses, and ink/water control. When you bring your ink film thickness down you need more stable ink so it does not begin to dry and increase the shear force split release at the print line. Thinner ink films negate the need for high tack inks to accomplish lower dot gain and thin ink films will not require additional dryers and low boiling rate solvents to speed drying like the thicker ink/water films with high tack inks.

Water system ink contamination can be traced back to several areas, one being sizing and binders, which repel water and attract ink that have entered the water system. In addition to the above-mentioned solutions, keep an eye on your in-feed tensions, keep them to a minimum. Careful attention to sequential timing is paramount. If your ink forms engage before the water, you already have ink in the dampening system before you produced your first sheet. To add insult to injury, you may have also been on impression with the ink forms in plate contact

thereby pulling sizing, filler, and binders with the ink into the dampening system. Sequential up should be water on – 1 – 2 – 3- 4 – seconds – ink on 1 – 2 – seconds - impression. Sequential down should be ink off 1 – 2 – 3- seconds - impression off - 1 – 2 seconds and water off.

To remove sizing, binders, & complex calcium from the dampening rollers use a soft nylon or Teflon vehicle window bug cleaner/pad. With certain metering / chrome cleaners and very light touch apply even hand pressure on the pad surface saturated with the metering / chrome cleaner while moving it across the chrome roller. You should feel the material break loose as the resistance decreases on the pad. Now do the same on the rubber rollers. As a final solution, drain the working fountain solution weekly and change the filter(s) at the same time.

If you are inclined to impose fault on the paper industry you might want to start with paper mills in Finland and work your way around the globe & then go to work on most western governments. With environmental laws, outside pressures, and current technology it would be difficult to turn paper manufacturers wet end chemistry, sizing, binders, and filler loading away from its current direction. You may want to save the phone bill and get your ink, roller, fountain solution, and press cleaning suppliers to move with the changing times of environmental paper manufacturing.

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