

EXPERTIP

Category	PRESS
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The Impact of Chlorine Residuals on Press Fabrics

Nylon yarns are used in most press fabrics due to their strength and wear characteristics. In general, nylon has excellent chemical resistance, being extremely resistant to oils and fuels, and stable when in contact with most inorganic chemicals. However, nylon has a potential problem when exposed to oxidants and decolorants such as chlorine.

Chlorine is introduced into your paper machine both directly and indirectly: bleached pulp furnishes, slimicides, fabric cleaners, and from chlorination of the water itself. Some of the chlorine remains as elemental chlorine; some can react with water-containing amines to produce chloroamines; and some may combine with impurities in the system to form other compounds.

Testing

Total chlorine residual, no matter what the source, is defined as the total amount of free chlorine and chloramines. You can measure the chlorine residual using a hand-held kit similar to a swimming pool test kit. It is important that you test at the site of the source, as errors can be introduced by transporting the liquid to be tested, covered or uncovered, from one location to another.

Chlorine spikes can be very difficult to detect when testing once per day, or even once per shift. For example, one mill experiencing chlorine spikes documented a three-day lapse between a measurement of a chlorine spike in the system and the appearance of nylon fiber (an indication of fabric shedding) in their Sweco screens.

Factors Affecting Chlorine Degradation of Nylon

Two factors play a significant role in how chlorine affects the nylon in a press fabric: temperature and pH. Figure 1 shows the relative reaction rate of chlorine as a function of temperature. This is why it is recommended to keep the water temperature near 100°F (38° C).

Figure 2 shows a comparison of pH and acidity rate. For slimicide control, pH is usually adjusted to the acidic side to get the maximum effectiveness from the product. However, with regard to the effect of chlorine on the nylon in a press fabric, for every 1 unit drop in pH, there is a 10-fold increase in acidity. In an acidic environment, residual chlorine will readily degrade nylon yarns in the press fabric, causing symptoms such as shedding, strength loss, and accelerated wear. This is why it is recommended that the pH when using chlorinated products be in the neutral-to-alkaline range (6.5 – 9.0).

The rule of thumb with press fabrics is to keep the total residual chlorine below 0.8 ppm. If it cannot be kept below 0.8 ppm range, you should consider using an online chlorine detector and a scavenger additive system on a continuous basis. Chlorine scavengers (e.g. chlorine bisulfite) can be obtained from your chemical supplier. Typically, the scavenger is metered to a continuous shower source.

As a chlorine alternative, some mills are changing their slimicide to hypobromous acid. The bromine in the acid is a much larger size ion than chlorine, significantly reducing the tendency for the slimicide to degrade the nylon in the press fabric.

Figure 1

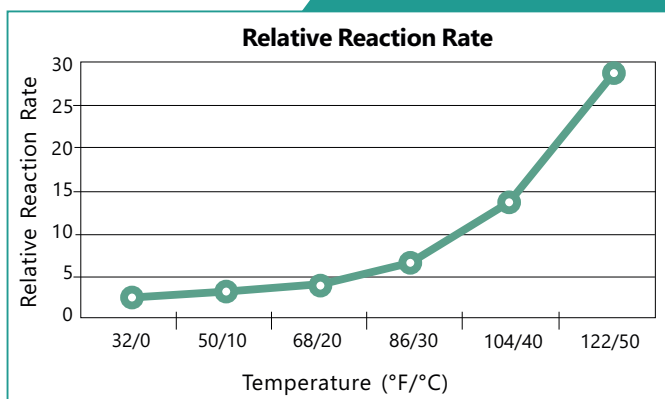
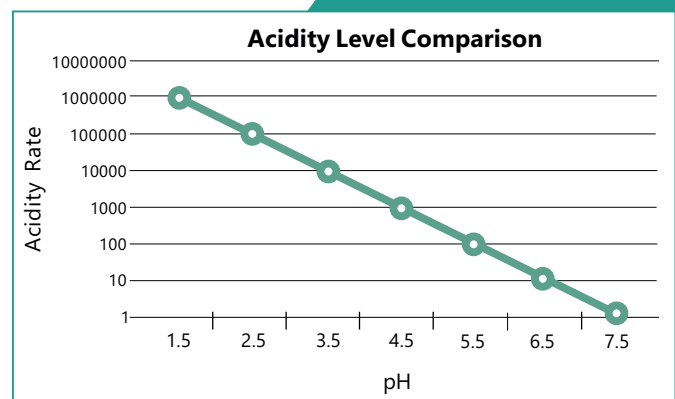


Figure 2



Questions?

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