Monitor & Control the Color of Paper Throughout Production

To ensure color quality, many paper manufacturers pull a sample to measure in the lab, but by the time a color issue is identified most of the roll is already wasted. To keep color and brightness in harmony, paper manufacturers must constantly monitor color on fast running paper machines.

Challenges

Many production variables can cause color shifts throughout a run. If not monitored, these errors can quickly waste an entire roll during a continuous dye run.

- Variability in raw materials, recycled paper, opacity, thickness, additives, and dye concentration can all impact final color.
- Manually switching colors on the reel wastes time and materials.
- Dyes, pigments and optical brightening agents (OBAs) are expensive, making it important to get up to color fast.

Solution

X-Rite's inline paper color measurement and control system includes a non-contact spectrophotometer, a custom frame to position the device over the paper roll, and quality control software to monitor color throughout the run. It serves as an early warning system by alerting the operator of a shade change and automatically adjusting dye pumps to bring color back into tolerance. It also offers automatic start up and shade changes to further minimize operator intervention.

The inline system can span the entire process, from laboratory measurement to pulp, wet sheet, and measurement before reel up, to keep color and brightness in harmony. For laminated paper, it can measure the wet paper before drying with a good correlation to the finished product. It can also simultaneously monitor and control both sides of a paper using two instruments.

Results

Monitoring color inline throughout production provides operators with real-time color information to avoid costly line errors and rework.

- Achieve more stable and consistent color
- Waste up to 50% less material, time, and energy
- Attain accurate whiteness using less OBAs
- Reduce operator intervention by up to 45 minutes per automatic startup

APPLICATION BRIEF

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How it Works

A custom frame is built to fit the paper machine. This frame holds the inline spectrophotometer over the paper roll to take measurements, moves the instrument away during a sheet break, lowers the arm to feed up the paper, and returns to position when its time to run. Measurement is most commonly set before reel up, but this system can also monitor color at the pulp as an early warning before arriving at the machine.

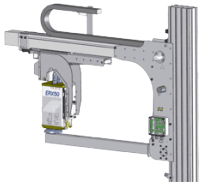
The inline spectrophotometer is connected to a computer running quality control or full closed loop color control software. The software uses color data captured by the instrument to calculate the adjustment of dyes and optical brightening agents and automatically adjust the dye pumps to achieve the target color.

To make a shade change, the operator chooses the color from the database and the system will automatically adjust the dye pumps and start the run. The QC software can also report up to eight color trends in L*a*b*, Delta E, whiteness, and opacity so operators can understand color deviation and implement process improvements on the spot.

Featured Products

ERX40 Inline Spectrophotometer
Measures whiteness and brightness shifts directly into the thick pulp (concentration of 3% to 5%) through a bypass system.

ERX50 Inline Spectrophotometer
Measures color, whiteness and brightness inline on the finished paper and evaluates color deviation to enable corrections without stopping production. With standardized 45°/0° measurement geometry, it provides good correlation to laboratory instruments.



Measurement Frame
A customized stainless-steel frame that can be built to fit any production line and mount the inline spectrophotometer above the web.

ESWin Quality Control Software
A customizable software solution that integrates with inline spectrophotometers to evaluate OBAs and control color quality, evaluate trends, and correct current or emerging problems. ESWin can connect for bi-directional communication to any process control or ERP system using OPC.

ESWIN CLCC Software
When combined with an X-Rite inline color measurement instrument such as the ERX50, ESWin CLCC manages color quality on continuous process manufacturing lines, displays results and runs automatic in-line closed-loop color control on papermaking and other machinery.

An inline solution from X-Rite can help paper manufacturers monitor color in real time throughout production to keep color and brightness in harmony from laboratory measurement to pulp, wet sheet, and before reel up.

Learn more at www.xrite.com/categories/inline-measurement

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