Online porosity measurement helps reduce coating costs by 10%

A European thermal paper producer was experiencing variability issues that was causing the mill to increase the coating amount, which only partially helped the high variation. After installing the ACA Permi sensor, the mill was able to make a clear correlation between smoothness and porosity. After making process adjustments, the mill both reduced variability and raw material costs.

**Background**

For coated papers, a smooth surface is paramount for an even base in printing and in some cases, for further specialty coatings. Thermal paper, for instance needs a smooth surface to enhance layer uniformity and heat response. The surface after coating has a direct correlation to paper porosity before first coating process. Therefore, it is important to achieve low porosity on paper before coating to use the least amount of coating to obtain a smooth surface. An online porosity measurement gives operators visibility to adjust the wet end process to control the porous structure of paper.

**Challenge**

The thermal paper producer was struggling with variation; while they were targeting a Parker Print Surf (PPS) smoothness value of 1.2 µm/Pa.s, the mill found variations between 1.1-1.6 µm/Pa.s. The mill tried to adjust the smoothness using the coating unit’s blade settings, but there was delay because of the wait time for lab measurements. The coating amount was then increased to get better values, but variation remained high.

The mill also tried to balance the heat sensitive coating weight and image forming chemicals while staying in the lower limit of the Outside Diameter (OD) but sometimes the printing image resolution was poor without the ability to lower the sensitivity of the coating color or coat weight.

The mill needed more visibility into the process.

Did you know the receipt slips you get after making a purchase or withdrawing cash is actually made from thermal paper?
Solution

The mill chose ACA Permi as the online porosity sensor that would provide needed visibility.

Very soon after the proper adjustment of the measuring unit, it was also easy to see how the final paper smoothness was varying in correlation to the online porosity value. Mill personnel were able to analyze these results and found how the paper structure reacted when broke quality and content were changed in furnish or when the refining degree was adjusted. Using these insights gleaned from the ACA Permi, the mill was able to define parameters to stabilize and optimize the wet end.

Results

A PPS smoothness variation from 1.1–1.3 µm/Pa.s could be achieved, decreasing variability by 27%. This improved the thermal printing resolution and measured OD decreased.

Based on achieved quality improvement in surface uniformity, the mill was able to reduce the amount of the expensive chemicals resulting in a 10% cost savings in raw materials.

Benefits

- Faster corrective action with real-time porosity measurement
- Improved runnability and production
- Better product quality
- Reduced energy and raw material use