PHYSICAL ELECTRONICS
A DIVISION OF ULVAC-PHI

Automated QC Analysis: Silicone Detection with the *Quantera* II Scanning XPS Microprobe

Introduction

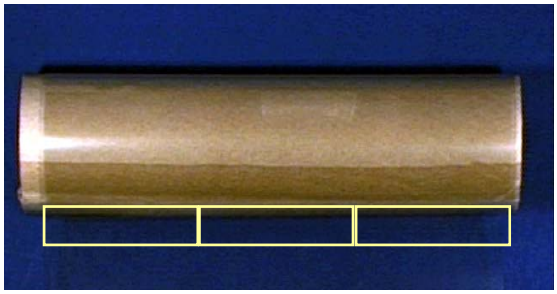
The surface composition of polymer and paper products plays a critical role in printing, coating and bonding to them. Silicones are the most common source of surface contamination that interferes with coating processes, causing delamination or voids in coatings.

The amount of silicone contamination that can be tolerated varies with the process and the materials involved. The *Quantera* II provides the ability to automatically analyze a large number of sample locations and provide an accurate quantitative measurement of the level of silicone contamination on the surface.

Automated Multi-Sample Analysis

To demonstrate the *Quantera* II's ability to detect and quantify silicone contamination, sections from across the roll of a polyester graphic arts product were analyzed.

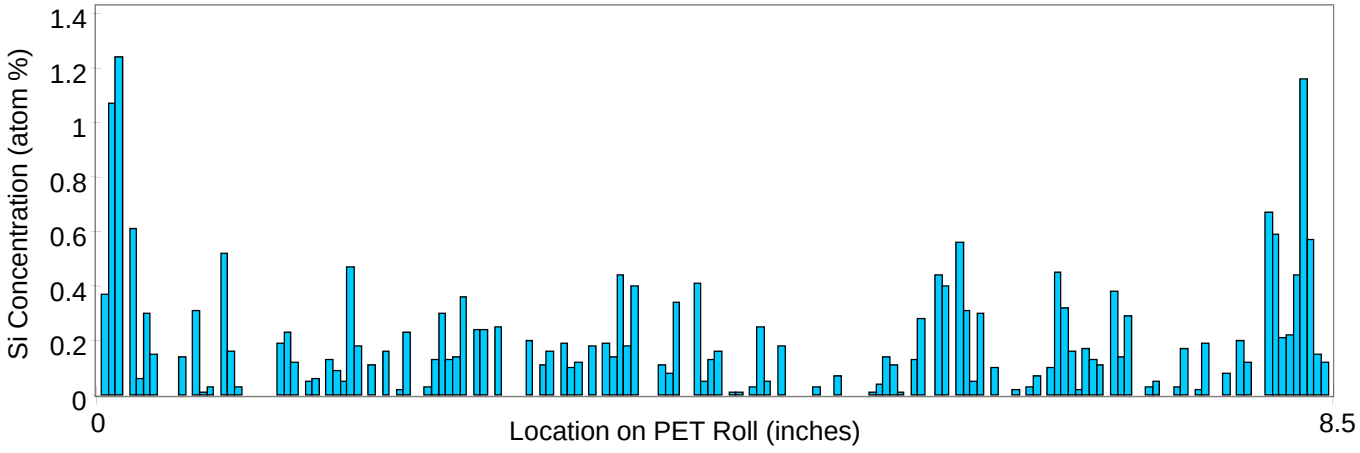
The *Quantera* II's instrument control software provides the ability to quickly define an array of data points across a sample section and automatically position the sample at the focal point of the analyzer. In this example, 180 locations were analyzed across the 8.5 inch wide roll.



Three sections were cut from the polymer roll and attached to a 75 x 75 mm sample platen for analysis in the Quantera II.

Complete spectra were collected at each location and quantitative surface composition measurements were obtained in a batch process using PHI *MultiPak* data reduction software.

Silicon was detected on the surface and binding energy measurements indicated it was present as a silicone. The silicon concentration varied from 0.0 to 1.2 atom percent across the roll, with significantly higher concentrations detected at the outer edges of the roll. It is believed that a silicone lubricant used on processing equipment was the source of the contamination.



The Quantera II provides the automation and surface sensitivity needed to quickly sample the surface of polymer and paper products at multiple locations and report the presence of surface contaminants.

Summary
The Quantera II provides high sensitivity for the detection of surface contaminants such as silicones and the ability to automatically analyze a large number of insulating samples without operator intervention. In this example 180 locations were automatically analyzed and increased levels of silicone contamination were detected near the edges of the polymer roll.

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