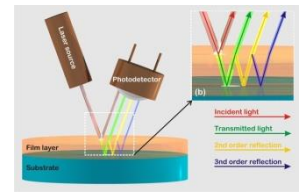


ThetaMetrisis APPLICATION NOTE #033

Accurate, Non-Contact On-Line PET film Thickness Measurements



Introduction: The **FR-inLine** is an online no-contact thickness gauge designed for measuring at real-time the thickness of transparent and semi-transparent single films or stack of films and most materials produced in sheet or strip form. In this application note, we demonstrate on-line thickness measurements of a PET film, using FR-Tools.

Means & Methods: Reflectance measurements of a PET film, during roll-to-roll process (Figure 1), performed using **ThetaMetrisis FR-inLine tool**, operating at the spectral range of 350 - 1000nm. The real-time measurement shows in Figure 1.



Figure 1: Real-time thickness measurement of PET film

Results: Typical experimental (black line) and fitted reflectance spectra (red line), as recorded and processed by the FR-Monitor software, are illustrated in Figure 2a. The fitting was applied in the 650-700 nm spectral range, and the thickness of the PET found to be 13.5um. In Figure 2b the thickness variation of PET film rolling with a speed of 5.6m/sec is presented.

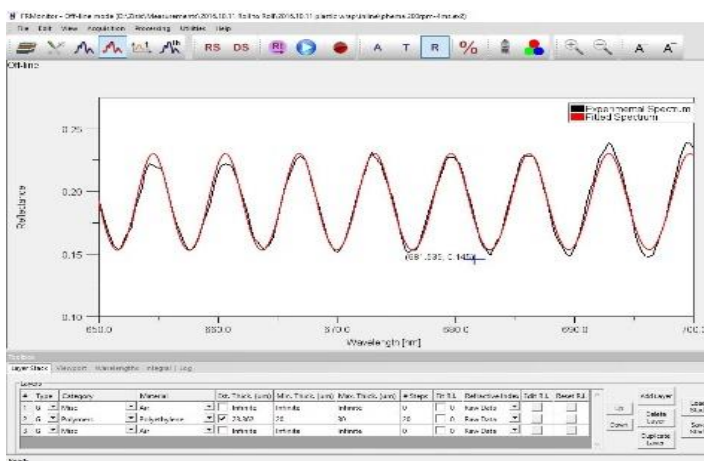


Figure 2a: Specular Reflectance of PET film as recorded by FR-Monitor. Thickness measured at 13.5um

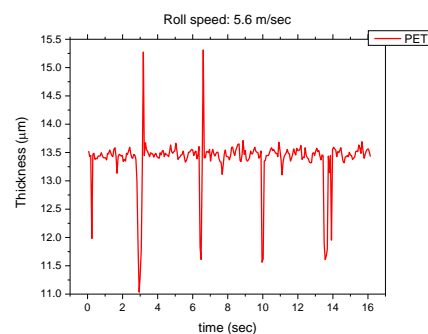


Figure 2b: Thickness variation of a PET film rolling with a speed of 5.5m/min

Conclusions: **FR-inLine** is an easily to install compact & robust solution for accurate & precise non-destructive reflectance/transmittance measurements for films in the VIS/NIR spectral range.