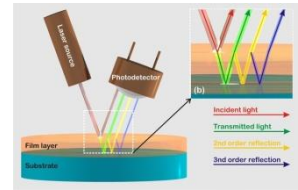


ThetaMetrisis APPLICATION NOTE #031

Thickness measurement of color coatings of aluminum cans

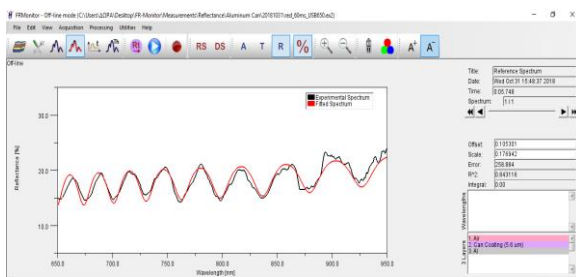


Introduction: Beverage/Food aluminum cans are normally coated on both sides with protective layers of polymers. Those coatings provide protection of the metal from the environment (atmospheric corrosion), support decoration, labelling and consumer information and influence mobility (friction) of the can during filling operations – e.g. beverage cans can only be filled with an external decoration, which provides the necessary friction (mobility) to pass through the filling head. In this application note, we measure the thickness of the different color coatings of an aluminum can, using FR-Tools.

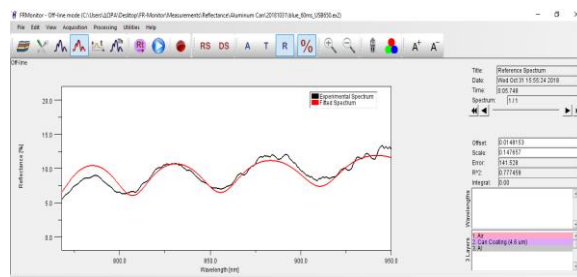
Means & Methods: Sample for characterization was a beverage (beer) aluminum can. Thickness measurements of the different color coatings were performed at the positions shown in Figure at right. The coating thickness was measured by Reflectance measurements performed using **ThetaMetrisis FR-Basic VIS/NIR** tool, operating at the spectral range of 350 - 1000nm.



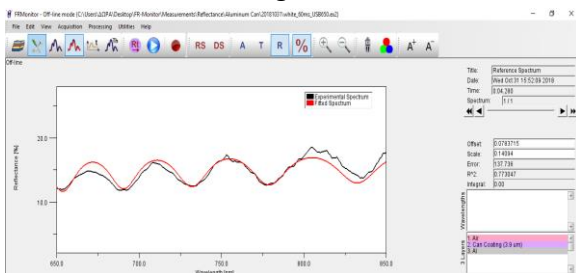
Results: Typical experimental (black line) and fitted reflectance spectra (red line), as recorded and processed by FR-Monitor software®, are illustrated in Figures below for all points with different colors. In the case of the red color area, the fitting was applied in the 650-950 nm spectral range, and the thickness of the coating found to be 5.6um, for blue color, the fitting was applied in the 700-950 nm spectral range, and the thickness of the coating found to be 4.6um. The selection of different spectral range for each location is imposed by the absorption characteristics of the material used and highlight the versatility of the tool. For white color the fitting was applied in the 650-800 nm spectral range and the coating thickness found to be 3.9um and for silver color area the fitting was applied in the 650-950 nm spectral range, and the thickness of the coating found to be 3um.



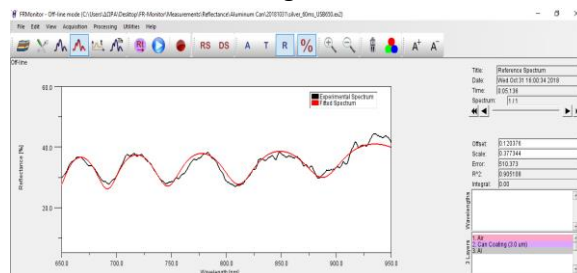
Red color coating thickness = 5.6um



Blue color coating thickness = 4.6um



White color coating thickness = 3.9um



Silver color coating thickness = 3.0um

Conclusions: The thickness of the external different color coatings have been successfully determined using FR-Tools.