Application Note POLYMER012

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POLYMER012: Non-Destructive Thickness Analysis of Plating Layer on ABS

Introduction

ABS plastic parts used for automobile exteriors are plated with multiple layers of plating. Proper evaluation of the film thickness of each layer is important to control the quality of product appearance and performance. Methods based on destructive inspection or cross-sectional polishing are labor-intensive and unsuitable for rapid in-process feedback. Using XRF, film thickness on the order of nm to µm can be quantified nondestructively and in a short time, contributing to quality stabilization in the process and reducing the outflow of defects.

Residual stress

Analysis:	Parts and end products
Use:	Process control, failure analysis, quality assurance
Analyzed materials:	ABS (Acrylonitrile Butadiene Styrene) resin plating
Analysis method:	Standardless FP method

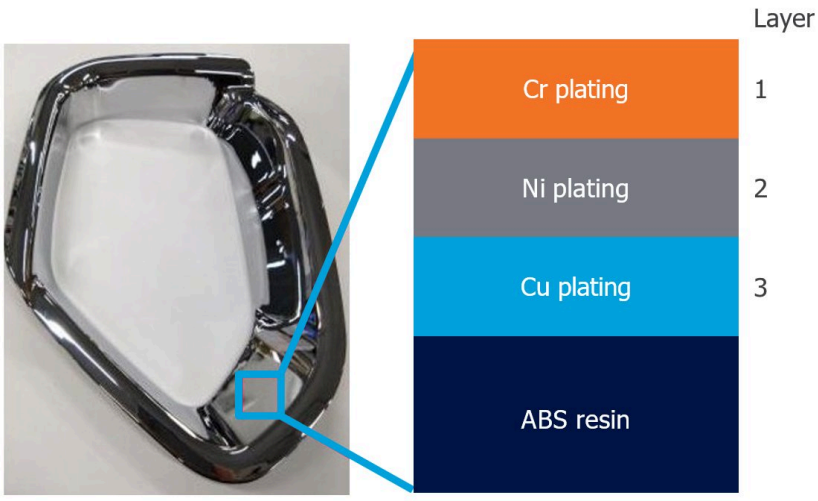

Figure 1: Sample and its layer structure

Table 1: Accuracy confirmation results by repeated measurements

	Analysis value (nm)	Standard deviation (nm)	C.V. (%)
Layer 1	609	0.8	0.13
Layer 2	320	0.2	0.067
Layer 3	8305	9.8	0.12

Conclusion

Film thickness analysis using XRF was performed on parts plated with Cu, Ni, and Cr on ABS resin in that order. Two minutes of measurement time per sample is short, and the film thickness of each layer can be simultaneously determined nondestructively. Repeated measurement provides high reproducibility with a C.V. of approximately 0.1%, making it suitable for in-process quantitative control and variation evaluation.

Related products

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High power, tube above, sequential WDXRF spectrometer wi
th new ZSX Guidance expert system software