EQUITECH

Inline Process Monitoring

IN-LINE FILM THICKNESS MEASUREMENT

Monitoring thickness of coatings or layers is an indicator for product quality. Examples include: wet coatings, laminates, co-extruded polymers, architectural glass and art glass. Real-time adjustments of the process parameters are therefore possible through immediate 'off-specification' detection.

INTRODUCTION

White light interference is a well-accepted technology to measure the thickness of a layer or film in the production process. Usually these measurements are performed 'off -line'.

The delay between sampling and obtaining the results from the laboratory can be time consuming. A significant disadvantage is that only a single measurement is generated in this time period and the thickness during, before and after the sampling point is unknown.

With the in-line film thickness measurements taking place directly in the process, not only is complete documentation possible, but when variations occur, immediate intervention can take place.

INNOVATION

The Equispec™ Film Thickness Analyzer (FTA) is a high performance instrument designed for use in an industrial process. Its excellent sensitivity and flexibility make it useful for both process applications (films, sheets, panes) and static (e.g. laboratory measurements). The FTA and Film Thickness Probe can be used to analyze both liquid and solid films or coatings.

Layer thickness is computed from the interference spectrum and index of refraction of the material.

Photo 1 : Equitech's Film Thickness Measurement

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Equitech's fiber-optic probes allow for easy access into the process. Equitech's Film Thickness Probe is compact and easy to install (see Photo 1).

The spectrophotometer is integrated in a NEMA4 box with an industrial computer and touch-screen (see photo 2). The typical spectral range is 400-900 nm (resolution 1 nm). The NEMA4 box is made from stainless steel. It is designed and equipped specifically for use in the production environment where the ambient conditions can be dusty, vary in temperature, subject to vibration etc. The box also contains a thermoelectric cooling and heating device to eliminate the influences from ambient temperature by keeping the temperature inside the box at a constant level.

Photo 2: FTA stainless steel NEMA4 box with touch-screen

Results are calculated and displayed by EquiFilm™ software (see Photo 3). Layer thicknesses are tracked via trend charts and logged to a file. Up to 5 layers may be independently determined in suitable samples.

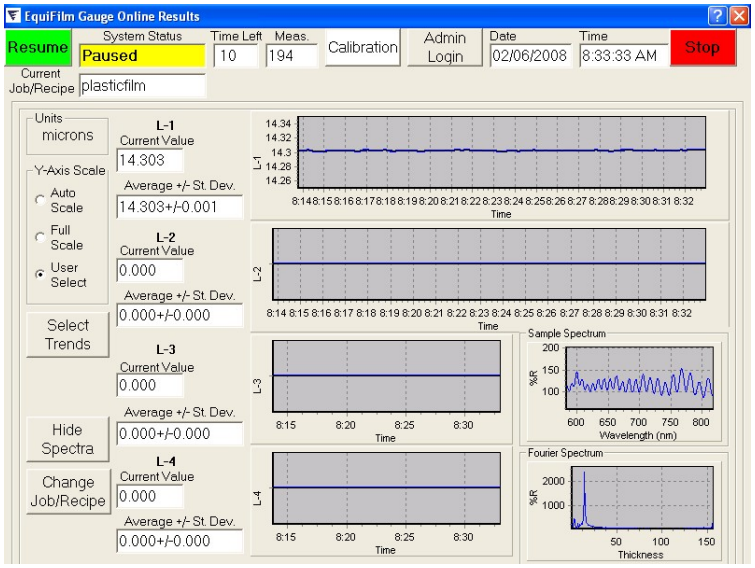

Photo 3: Trend charts of EquiFilm™ Software

PROCESS MONITORING

The manufacturing of a thin layer is a very complex process subject to influence by various factors including temperature, dosing, distribution and line speed. These factors affect the uniformity of the produced material. For continuous process monitoring, 10 to 60 seconds is recommended as the measurement interval. Intervals as fast as 1 to 2 seconds are possible.

INSTALLED APPLICATIONS INCLUDE

automobile headlights and windshields, computer displays, architectural glasses, multi-layer plastics

For more information or to discuss your film thickness application in detail,

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