

DFM1 - Dynamic Dry Film Thickness Measurement and Monitoring

Precisely monitor production coating thickness in real time – no calibration is required regardless of paint system

On line Dynamic Film Monitor, DFM1 measures the paint film thickness of the cured paint at line speeds of up to 650 fpm (200 mpm) in real time. Line operators will have the benefit of rapid coating thickness feedback enabling fine tuning of the coater setup at the commencement of any production run. DFM1 also provides ongoing monitoring of the coating process throughout production. Coating thickness can be optimized without compromising product quality and thickness specifications. The instrumentation is typically located just after the exit accumulator and prior to the inspection station. Measurements can be made on demand by the press of a button, or can be programmed according to selected time intervals. Results are presented dynamically in real time on a rolling graphical interface.

The thickness of painted metal strip is quite variable over short distances due to the topography (surface roughness) of both the underlying metallic substrate and the paint coating itself. Individual DFM1 measurements are very accurate

on a point to point basis hence the results are presented as average and standard deviation values. Depending on whether the system selected is manual or automated, an alarm will be raised if the thickness deviates outside set point values, or the system can adjust and maintain the coating thickness by controlling coating parameters. All actions and results of the system will be recorded in a database.

The system is immune to variations in substrate thickness and calibration is not required for different paint types. The wide variety of paints tested so far using this system include polyesters, SMPs, PVDF coatings, plastisols, and water based coatings. The system has also measured primers on aluminum substrates.

Precisely monitor coating thickness in real time



Principle of Operation

An ablation laser is programmed to burn a short line of about 20 tiny 10 mil (0.18mm) diameter hole through the paint without removal of any of the underlying metal. The hole profile is then measured by a further laser sensor downstream at up to 30,000 times per second. Sophisticated data analysis algorithms convert this dynamic non contact laser data into a precise measurement of coating thickness. Reliability of the measurement has been thoroughly validated. Measurements can be made near the strip edge in a region of the product that would typically become a cladding overlap region. The frequency of measurements is set by the operator, and one or two measurements are typically required per ton of coated product. The laser ablation holes in the paint do not adversely affect the performance of decorative product. There would be some detrimental impact for barrier coatings such as plastisols however measurements can be carefully programmed to coincide with the start and end of any coil or part order.