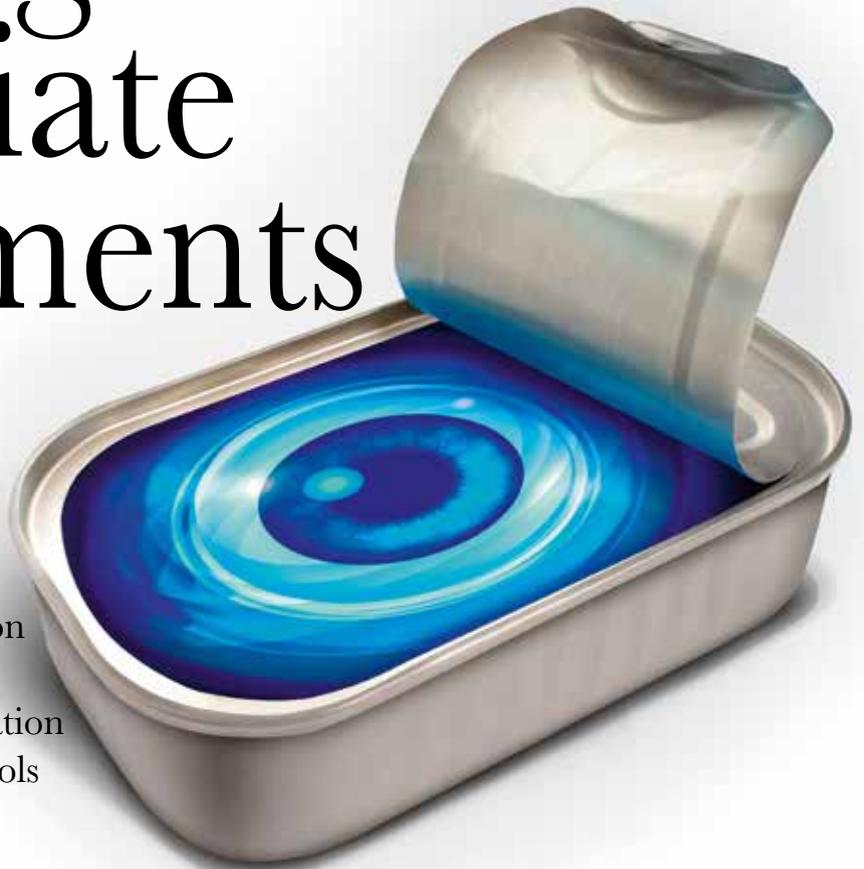


# Seeing immediate improvements

The importance of continuous coating process improvements, cost reduction efforts and the need for greener production procedures are driving global metal packaging manufacturers to a new generation of in-process film weight measurement tools



**M**anufacturers of coated flat sheets, coils and three-piece cans are improving their coated product quality thanks to the use of non-contact in-line coating thickness measurement systems. These systems improve coating process control and coating quality, while reducing the time to measure wet and dry clear and pigmented coatings on all metal substrates used in the metal packaging industry worldwide.

## IMPROVE COATING PRECISION WITH IN-PROCESS MEASUREMENT

Conventional measurement methods for determining film weights face longstanding challenges. Manual measurements require a time consuming investment of QA man hours for samples that are not representative of the entire run. Whereas, indirect measurement tools do not measure the true thickness of the coating, but rely instead on accuracy of third party standards. These measurement methods often result in the one or more applied coating layers being 'over-applied' or 'under-applied' relative to manufacturing specification. Uncertainties of applied film weights meeting required specifications have many companies erring on the

side of coating "too much rather than too little" since existing tools cannot accurately measure all applications directly on the line.

The ruggedised optical interference (ROI) technology designed into all SpecMetrix In-line systems is designed for the rigours and variables of most manufacturing environments including flutter, temperature and humidity fluctuations. The systems incorporate a broad wavelength range that enables them to accurately monitor coating thickness as low as 0.25 microns – and take up to 150 measurements a second per probe, at production line speeds up to 1,800 feet per minute.

With ROI technology, all measurements are non-contact and non-destructive and provide absolute thickness measurements of coatings without the need to rely on calibration standards or the accuracy of the standards. Individual layers can be discretely measured in both wet and dry states with the wet measurement capability giving manufacturers a significant new ability to catch film weight issues much earlier in the process. ROI technology is substrate independent and works well on all metal packaging substrates including aluminium, steel, TFS and tinplate. The systems are flexible enough to more accurately measure single or double layers

of transparent and pigmented coatings and even some metallic coatings, including aluminised.

With in-process coating measurement, plant teams will see immediate film weight results and can adjust their coater accordingly without losing production time waiting for first piece inspection results from the quality lab. In addition to these immediate benefits, multiple plants have found other benefits such as identifying deteriorating roller and pump performance, avoidance of customer claims since electronic records of all film weight data from full production runs is available, reduction of trial times on new coatings, and detection of all drifts in coating weight during production that now go unidentified using manual weight checks.

The ability to exclusively measure thickness of the discrete varnish layer even over printed substrates has resulted in verified customer findings that varnish applied on printed sheets compared to unprinted flat sheets under the same coating conditions may be applied from 10-20 per cent higher than expected.

Since the most prevalent OV measurement method is to weigh varnish on a bare sheet or disc without print, it is highly likely that most plants can reduce lacquer consumption on many coated flat sheet products. Applied lacquers or more expensive UV varnishes can also be reduced on printed sheets following the integration of in-line measurement systems onto coating lines. Plants that can control their film weights more towards nominal specifications rather than holding general spec limits verified by gravimetric or capacitance gauges using periodic test samples can reduce plant risk of applying unknown film weights over extended periods and the hidden costs of over-application by operators wanting to avoid under application without reliable film weight data.

System software typically incorporates a database of customer coating recipes that the system operator can access via a drop-down menu to start the process. The system displays absolute thickness readouts of a coating layer in real time and monitors film weight control, using colour coding to identify production tolerances on display screens. All film weight measurements are displayed by the in-line system immediately after the coating is applied – either wet or dry. Continuous right and left side in-line film weight measurement data results in better coating uniformity across coated sheets and prevents roller misalignment. These systems typically provide tens of thousands of film weight measurement checks per pallet versus the small number of sample QA checks, meaning greater coating quality assurance. Consequently, fewer unexpected and undetected coating application issues pass into downstream conversion processes or to the customer.

The assurance of optimised coating quality yields



significant changeover, setup time and environmental benefits. A coating name is simply selected at changeover from a drop-down menu, with initial measurement data displayed within several seconds of starting the production run. Hundreds of global customers have verified significant reductions in scrap, setup and changeover times compared to time consuming traditional coating weight checks.

With continuous coating thickness monitoring, fewer batches of coated sheets would be isolated within HFI areas as potentially out of spec.

Time reductions occur from removing pre-weighing tasks and wait times for coatings to be cured in the oven before measurement. In addition to time, the chance of an oven full of coated plate unknowingly being at risk without assured film weights is diminished.

Many users have reported reductions in plant waste streams of up to 75 per cent. Companies have also reduced their environmental footprints with less solvent and oven usage, thereby lowering plant emissions and energy costs. [CT](#)

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