

Lumetrics OptiGauge Project Applications Notes

The OptiGauge is a versatile precision measurement system that improves product yields and can be integrated into many manufacturing systems and processes. Lumetrics has designed and installed gauging systems for a range of industries to allow real-time production monitoring of coating, laminating, and component assembly machines.

The following examples of on-line measurement systems illustrate the software and hardware integration capabilities that Lumetrics can bring to bear on a variety of customer applications.

Adhesives

1. Internationally recognized manufacturer of medical and commercial products needed an automated gauging system for their range of products.
 - OptiGauge measurement probes were installed on automatic scanner frames to measure 48" to 60" web widths.
 - Measurements are taken of wet adhesive, prior the curing ovens. General thickness range is 1 – 2 mils.
 - Closed loop feedback system automatically adjusts adhesive thickness during application through use of a PID controller (proportional integral derivative) interface utilizing automatic error-closing algorithms to control adhesive thickness at the application well.
 - The system HMI is Ethernet enabled for at-machine or remote access and control on secure-access factory network.
 - Data is displayed in real time only; this customer did not request archiving or backup storage of measurement information.

2. Multinational contract provider of diagnostic films, wound care, and other medical & commercial adhesive products was requested by their biggest medical products customer to evaluate OptiGauge to verify consistent product quality. This company manufactures many different laminated products with up to five layers of various support material and adhesives.
 - Lumetrics installed eight measurement probes and optical multiplexer on two different production machines with web widths up to 48". Measurement probes are installed at three separate locations in the plant:
 - Adhesive applicator, after coating (wet) – two probes.
 - Adhesive curing machine, post cure – three probes.
 - Laminating machine, post lamination, three probes
 - All probes are installed on rigid frame and are laterally adjustable depending on customer requirements.
 - Lumetrics developed custom software interface that allows creation of a recipe database for each product.

OptiGauge Precision Thickness Measurement

- Recipes automatically configure the OptiGauge using material and layer database information. Automatically imports machine settings based on the recipe file.
- Monitors real-time thickness and provides visual reference on thickness measurement.
- Automatically generates reports – run stats, graphs of product over each roll.
- Communicates to plant PLC's to automatically start, pause production and generate reports during roll changes or on engineer command.
- Measurements are controlled at the machine-level; however Ethernet capability for remote control of OptiGauge settings is available if needed.
- System has two levels of security. Operator and engineer access is separate to control who can change system settings, run diagnostic tests, etc.
- Custom designed HMI displays graphs and charts in real time that correspond to manufacturing specs → visual dashboard alarms in red, green, and yellow for out-of-spec or marginal readings.
- Data is archived to network locations for future reference.

Food Manufacturing

Internationally known food products manufacturer needed to measure multi-layer laminated material on a meat product packaging line to optimize thickness of high cost barrier layer resin that directly impacts product quality and shelf life.

- Company has four separate meat packing lines that with two 18" narrow web laminated packaging film per machine: one top web and one bottom web.
- One automatic Lumetrics measurement probe scanner frame with two opposing probes was installed on each machine.
- Software was developed that automatically polls all eight probes in order (machine #1 – top/bottom, etc.). Operator intervention is allowed to prioritize measurements on a particular probe for a user-defined time.
- The scanning software automatically finds the edges of the web and proportionally divides the web into discrete cross-sections that correspond to the thickness die bolt adjustment positions on the laminator.
 - Measurement information is fed to a closed loop system that automatically inputs die bolt adjustment to maintain thickness of the three layers within customer specifications.
- A scan summary is generated on each machine display screen and automatically archived for future retrieval and viewing (up to seven days on the local controller)
 - A PDF document from each of the four lines is automatically created every 24 hours and downloaded to the system controller for future viewing.
 - Seven days of data storage are allocated on the machine level controller and all data can be archived to an external shared network backup device.

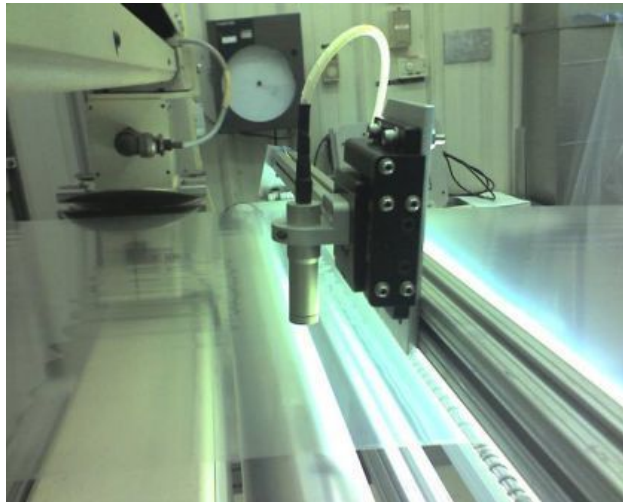
Medical Components

Manufacturer of precision capillary flow cells needed an automated approach to measuring and sorting their product.

- Individual parts consist of two flat pieces of clear Plexiglas that are laminated with precision spacers to create a narrow capillary space for fluids of interest.
- Target air gaps are 102 microns to 120 microns.

OptiGauge Precision Thickness Measurement

- Manufacturing process variation yields high number of marginal and out-of-spec parts that need to be routed to specific bins based on thickness or for re-work or scrap.
- Company needed an integrated closed loop inspection and sorting approach for 100% part inspection capability coupled with an automated sorting
- Lumetrics designed and installed custom software based on 21 discrete measurement ranges in approximately 1 micron increments that integrates with a mechanical sorter that provides relay outputs to the plant PLC system.
- Parts are automatically sorted into bins based on OptiGauge measurements.



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