Robotic PELT®
Automated Coating Thickness Measurement System

Benefits
- Fully automatic multi-layer coating thickness measurements
- Utilizes proven PELT® measurement technology
- Increased production quality sampling
- Reduced scrap material using non-destructive measurements

Features
- Multi-layer: gauging up to 5 coating layers at each measurement point
- Integrated distance sensor and positioning
- Integration compatible with robotic color and appearance instruments

Robotic PELT
The Robotic PELT gauge is an automated, online coating thickness measurement system. Advanced PELT automation dramatically increases the paint process sampling rate.

The system utilizes the same proven high resolution PELT® ultrasonic technology used by our industry standard hand-held coating thickness gauges. The system can individually measure up to 5 coating layers simultaneously. Measurements can be made on virtually any substrate material including steel, aluminum, plastics, composites, glass, and wood.

The automated PELT film thickness sensors may be combined with online color and appearance gauges, enabling thickness, color, and appearance measurements from a single robotic cell.

Systems can be configured with single or multiple robots. Each robot utilizes a single PELT sensor End of Arm Tool (EOAT) with integrated distance sensing.

End of Arm Tooling and Positioning
The compact and lightweight EOAT includes an automatic, non-contacting distance sensor. Automated positioning using the distance information requires only rough programming of the measurement point locations. The robot’s final angle and distance to each measurement point are adjusted automatically.

End of Arm Tooling

PELT Thickness Measurement Data
Thickness measurement data is output in XML format. Files and data are available over the Ethernet network.
Robotic PELT® Specifications

Performance Characteristics

Measurement Method
PELT contact pulse-echo ultrasonic.

Couplant
Deionized water.

Calibrated Accuracy
± 1.3 microns (+/- 0.05 mils) or ± 2% of the coating thickness, whichever is the greater value.

Resolution
1 micron (0.001 mm, 0.04 mils)

Minimum Thickness
1
Mid coatings: 10 microns (0.010 mm, 0.4 mils)
Single coatings: 15 microns (0.015 mm, 0.6 mils)
Top coatings: 25 microns (0.025 mm, 1.0 mils)

Max Layers
5

Repeatability
± 0.51 micron (0.02 mils), typical (std deviation measurements, repeatedly gauging same job/part).

Radius of Curvature
8.6 mm diameter transducer with 16 mm diameter wear cap:
15 cm convex surface
50 cm concave

6.6 mm diameter transducer with 12.7 mm diameter wear cap:
15 cm convex surface
50 cm concave

Robots

Min/Max Robots
Single or multiple (up to 16) robots can be accommodated.

Communication
Via cell’s PLC using OPC.

Max Points
No limit. Programmable as a function of body/part style.

Max Part/Body Styles
No limit.

Conveyor/Cell Requirements
Stop station.

PLC Interface
OPC over Ethernet.

Power
100-230 VAC, 50/60 Hz

System

PELT Sensors
One per robot. Can accommodate up to 16 sensors per system.

Sensor Outer Diameter
12.7 or 15.88 mm (at contact)

Sensor Cable Length
33 m from robot arm to equipment cabinet/console.

Surface Temperature
49º C (120º F) maximum
7º C (45º F) minimum
10º C (50º F) to 32º C (90º F) preferred

Cycle Time
Approximately 6.5 minutes for 50 measurement locations with 2 Robots.

End of Arm Tooling

Weight
1.6 kg (PELT sensor tool, distance sensor, and turret).

PELT Sensor Spring Force
10 to 48 N, depending upon programmed value for sensor shaft spring compression.

Over-travel Protection
Over-travel sensor triggers at 19 mm sensor shaft displacement.

Maximum Travel/Displacement
25 mm.

Distance Sensor
Non-contacting ultrasonic.

Water
Requires filtered DI (deionized) water for ultrasonic couplant mister, 3 to 5 bar pressure.
Approx. 1 milliliter per measurement location.

Air
Only required if a pneumatic water valve is utilized and/or air blowoff is desired.

Note: Specifications are typical at 25º C
Specifications subject to change without notice.

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