Robotic PELT
Automated Coating Thickness Measurement System

Benefits
- Automated measurement solution ensures adequate sampling of paint production processes for multiple body styles, paint lines, and colors.
- Fully automatic multi-layer coating thickness measurements.
- Utilizes proven PELT® measurement technology.

Features
- Multi-layer: gauges up to 5 coating layers at each measurement point.
- Integrated distance sensor to determine distance and optionally orientation of measurement locations.
- PELT End of Arm tooling can be used in conjunction with robotic color and appearance devices on the same robots.

Robotic PELT
The Robotic PELT gauge is an automated coating thickness measurement system. A Robotic PELT system can continuously collect multi-layer thickness measurements of all body styles and paint lines that are routed to the measurement cell.

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 Robotic PELT End of Arm Tool can be used in conjunction 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 can be adjusted automatically.

PELT End of Arm Tooling

PELT Thickness Measurement Data
Thickness measurement data is output in XML format to data files 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\(^1\)  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  11 mm diameter transducer with
- 15 cm convex surface
- 50 cm concave

\(^1\) Minimum Thickness and Resolution are typical based upon: solvent-borne, water-borne, and powder paint coatings.

System

PELT Sensors  One per robot.
Sensor Outer Diameter  15 mm.
Sensor Cable Length  33 m from robot arm to equipment cabinet/console.
Surface Temperature  49 °C (120 °F) maximum
- 7 °C (45 °F) minimum
- 10 °C (50 °F) to 32 °C (90 °F) preferred.
Cycle Time  Approximately 6.5 minutes for 50 measurement locations with 2 Robots.

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
Robots
Min/Max Robots  One, two, or more robots can be accommodated.
Communication  Cell PLC via OPC over Ethernet.

Measurement Data Output

Measurement Data Format  XML formatted files.
Ultrasonic Data Files  PELT .wv3 file format. Compatible with PELT Explorer browser software.

End of Arm Tooling

Weight  1.6 kg (PELT sensor tool, distance sensor, and turret).
PELT Sensor Spring Force  6 N
Over-travel Protection  Over-travel sensor triggers at 19 mm sensor shaft displacement.
Maximum Travel/Displacement  19 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  Utilized for EOAT air bearing and optional air blowoff. 3.4 bar pressure.

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

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