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.

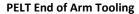
The Robotic PELT End of Arm Tool can be used in conjunction with online color and appearance gauges, enabling thickness, color, and appearance measurements from a single robotic cell.

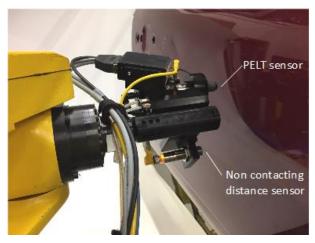
Systems can be configured with single or multiple robots. Each robot utilizes a single PELT sensor End of Arm Tool (EOAT) with integrated distance sensing.



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 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 \pm 1.3 microns (+/- 0.05 mils) or

± 2% of the coating thickness, whichever is the greater value.

Resolution¹ 1 micron (0.001 mm, 0.04 mils)

Minimum Thickness¹

Mid coatings: 07 microns (0.007 mm, 0.28 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 \pm 0.51 micron (0.02 mils), typical (std

deviation measurements, repeatedly

gauging same job/part).

Radius of 11 mm diameter transducer with

Curvature 15 mm diameter wear cap:

15 cm convex surface 50 cm concave

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.

 $\hbox{@ 2023, BYK-Gardner USA, Robotic PELT Rev. }08/23$

¹ Minimum Thickness and Resolution are a function of coating material properties and transducer type utilized.