

non-contact and
non-destructive
coating thickness
measurement

Coating Thickness Gauge LayerScan 590

optical-thermal
measurements

digital
signal processing



testing equipment for quality management

ERICHSEN
since 1910

Technical Description

**Measurement on the
widest range of substrates,
complex shaped parts
and on all colors**

**Measurement system
for coating quality
and process control**

Purpose and Application

The **LayerScan 590** measurement system is used for quality and process control in the powder coating, paint and thermal spray industries. A big benefit is the possibility to measure coating thickness early in their process, even on parts coated with uncured powder coating or wet paint.

The **LayerScan 590** measures thicknesses from 1 μm to 1 mm by non-contact and non-destructive method, immediately after the application. Regardless of the color of the coating or of the shape and material of the substrate, the device will provide accurate test results. It works on the principle of the thermal coating resistance.



Inspection of complex shaped parts – also on curved and inside surfaces as well as in corners and angles.



Check parts early in process – also suitable for wet paint uncured powder coating.



Inspect coatings on the widest range of substrates: metal, wood, plastic, CFRP, glass, etc.



Measure the thickness of all colors of coatings – accurately and rapidly. with a choice of three, quick and easy calibration options:

- no calibration (relative measurement)
- pre-calibration
- one-step calibration

Powerful, versatile and easy-to-use, the **LayerScan** provides a practical solution to improve part quality as well as simultaneously the efficiency in successively to be optimized coating processing.

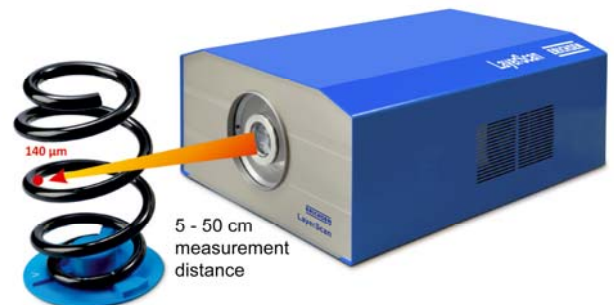
Test Principle

Proprietary technology for the non-destructive, non-contact measurement of coating properties uses the most advanced thermal optics (ATO) and digital signal processing (DSP) techniques.

The proprietary algorithms analyze the dynamic surface temperature progression – determining coating thickness and other properties, quantitatively and repeatably.

The **LayerScan 590** advanced thermal optics allow you to measure the coating thickness of parts in a non-destructive and non-contact manner – from a distance of 5 - 50 cm away.

As a result, you can inspect a wide range of parts, of different shapes and sizes, in almost any production environment.



Design and Function

During the thermal coating measurement a computer-controlled, pulsed flash lamp surrounding the LayerScan lens, warms the coating to be examined.



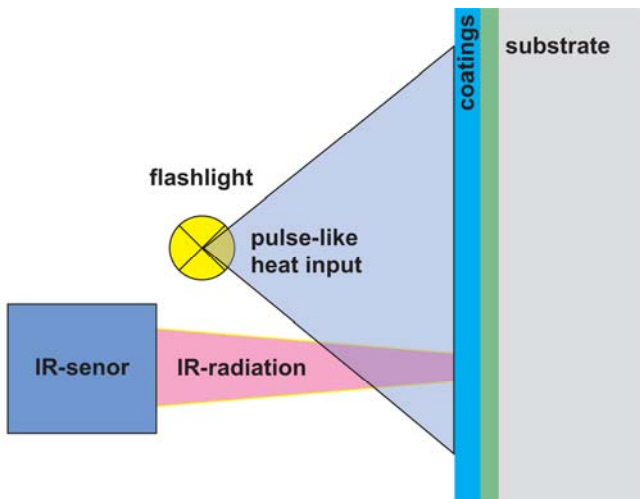
1 flash lamp
2 lens

A specialized infra-red detector in the lens monitors remotely the resulting surface temperature progression

The surface temperature decays with characteristic dynamics that depend on the thickness of the coating and the thermal properties of the substrate material.

The thinner the coating is (given that it has a lower thermal conductivity than the substrate), the faster the surface temperature decreases. The temperature behaviour over time provides information about the thickness of the coating.

Coating parameters such as layer thickness, but also the porosity of the thermal coating resistance, the thermal conductivity and the thermal diffusivity can be determined quickly and reproducibly.



Schematic diagram of the measuring principle

Inspect a precise spot

Furthermore, you can adjust the size of the inspection area depending on the part geometry, your quality criteria and process requirements.

So you can measure the coating thickness exactly where you want on the part, in a precise spot of 2 - 4 mm².

Inspect during procedure

The versatile **LayerScan** is designed for both **Off-line** and **In-line** measurements of coating properties. With its powerful features, the instrument is equally at home in your quality control lab as in your factory coating line.



Inspect In-Line in Real Time – instantly measure the coating thickness of parts as they move along your coating line, with real-time feedback for process control.

Order-Information	
Ord.-No.	Product-Description
0308.01.31	LayerScan 590-500 (500 J) measurement distance 5 – 15 cm, standard deviation < 4 % (depending on coating and substrate)
0308.02.31	LayerScan 590-1000 (1000 J) measurement distance 5 – 30 cm, standard deviation < 2 % (depending on coating and substrate)
0308.03.31	LayerScan 590-1500 (1500 J) measurement distance 5 – 40 cm, standard deviation < 1 % (depending on coating and substrate)
0308.04.31	LayerScan 590-2000 (2000 J) measurement distance 5 – 50 cm, standard deviation < 0.5 % (depending on coating and substrate)
Scope of supply includes: <ul style="list-style-type: none"> ◆ Software ◆ Main cable ◆ Manual 	

Further information as well as accessories please refer to our Price List No. 590.

	LayerScan 500	LayerScan 1000	LayerScan 1500	LayerScan 2000
Energy	500 J	1000 J	1500 J	2000 J
Marking measurement point	3 points	3 points	3 points	3 points
Measurement distance	5 cm – 15 cm *	5 cm – 30 cm *	5 cm – 40 cm *	5 cm – 50 cm *
Measurement point	Ø 2 – 20 mm *	Ø 2 – 20 mm *	Ø 2 – 20 mm *	Ø 2 – 20 mm *
Measurement range: Powder coating uncured Powder coating cured Pulverlack pre-cured Wet paint	1-500 µm 1-1000 µm 1-1000 µm 1-100 µm	1-500 µm 1-1000 µm 1-1000 µm 1-100 µm	1-500 µm 1-1000 µm 1-1000 µm 1-100 µm	1-500 µm 1-1000 µm 1-1000 µm 1-100 µm
Duration of measurement	20 ms – 1000 ms	20 ms – 1000 ms	20 ms – 1000 ms	20 ms – 1000 ms
Measuring object movement	50 m/min	50 m/min	50 m/min	50 m/min
Standard deviation	< 4 % **	< 2 % **	< 1 % **	< 0.5 % **
Angle tolerance	± 60°	± 60°	± 60°	± 60°
Net connection	IEC 320-C14	IEC 320-C14	IEC 320-C14	IEC 320-C14
Rated volage	230 V AC, 50 Hz	230 V AC, 50 Hz	230V AC, 50 Hz	230V AC, 50 Hz
Fuse	10 A	10 A	10 A	10 A
Power consumption	max. 2000 W	max. 2000 W	max. 2000 W	max. 2000 W
Operating temperature	5°C – 40°C	5°C – 40°C	5°C – 40°C	5°C – 40°C
Humidity	< 60 %	< 60 %	< 60 %	< 60 %
Dimensions	38 x 51 x 20 cm	38 x 51 x 20 cm	38 x 51 x 20 cm	38 x 51 x 20 cm
Weight	16 kg	16 kg	16 kg	16 kg
Housing material	aluminium	aluminium	aluminium	aluminium
Fixation	Guide rail and feet	Guide rail and feet	Guide rail and feet	Guide rail and feet
Interface: Ethernet WLAN External synchronization	yes yes yes	yes yes yes	yes yes yes	yes yes yes

* depending on distance / focal width
** depending on coating and substrate

The right of technical modifications is reserved.
Group 10 – TBE 590 – IV/2014

