


Measuring with Light

Online Paint Thickness
Measurement Using Thermal
Waves



Company	Method	Branch	Benefit	Reference
		<p>President of Phototherm Dr. Petry GmbH (Private Limited Company) Dr. Harald Petry, born 1950, received his Ph.D. in Physics from the University of Saarbrücken in 1982.</p> <p>After being a senior manager of Degro engineering company, St. Ingbert, he founded the Phototherm Dr. Petry GmbH in 1984.</p>		
Headquarters		Saarbrücken (Southwest of Germany and close to France)	in the IT Park Saarland	
Capital		187,000 EUR		
Expertise		thermal wave measurement systems		
Experience		more than 70 industrial installations worldwide		
Innovative power		☛ international Patents		
		☛ high R&D input		



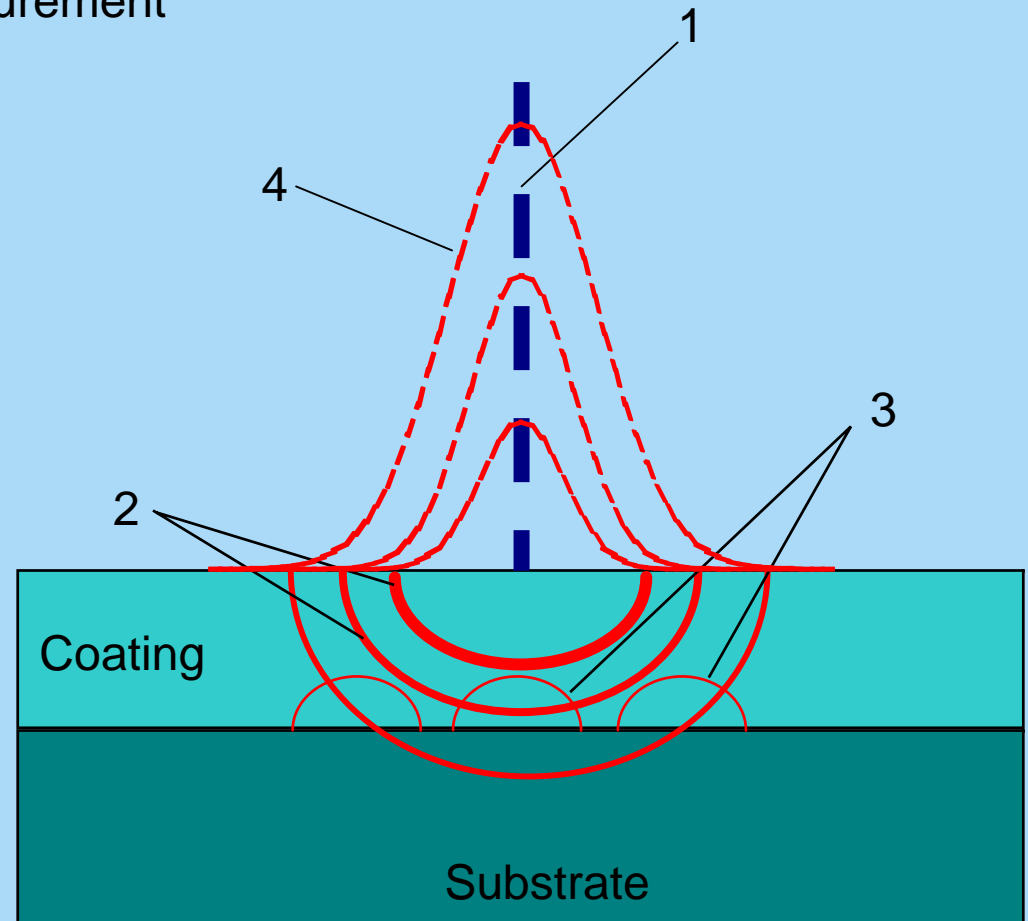
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Theory Behind Thermal Wave Measurement

- 1 Modulated light
- 2 Thermal waves
- 3 Reflections by substrate
- 4 Infrared field

The measurement principle employed is simple:

A laser beam causes the coating surface to heat slightly. The heat flows through the coating layer and is reflected by the substrate. The reflected heat is picked up by an infrared detector and converted by an electronic module, the reflection time being a measure of the coating thickness.



P.S. Online[®] etc., the solution for...

- Coil coating industry
- Powder coating industry
- Automotive industry

The range of potential applications extends through virtually all industrial sectors: aviation, car painting, adhesives, shelving systems, heating radiators, metal ceilings, building cladding and facades, etc.



Wet measurement with traversing unit - top side -

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Coating thickness	:	5-60 μm
Accuracy	:	+/- 0.5 μm
Working distance	:	250 mm
Strip moving	:	+/- 50 mm
Angle variations	:	+/- 20 degrees
Measurement time	:	1-5 sec
Product speed	:	up to 180 m/min
Base material	:	steel, galv. steel, Al, ...

Technical advantages

One sensor head for the entire range of coating thicknesses

No influence of strip variation in distance and angle to the sensor head

No calibration variation if strip base material (steel, steel/ zinc, aluminum) changes

Calibration easy and simple

Sensor head stable up to 40° temperature variation



Company	Method	Branch	Benefit	Reference
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Car body painting

- robot -

P.S. Online[®]



Single film thickness, wet	:	5-40 μm
Complete thickness, dry	:	5-150 μm
Accuracy	:	+ /- 1 μm
Working distance	:	up to 600 mm
Measurement range	:	+/- 200 mm
Measurement time	:	> 0,2-5 sec
Product speed	:	0-6 m/min
Coating material	:	all coatings
Base material	:	steel, galv. steel, Al, some plastics

Technical data

Measurement principle - thermal waves by laser

Measuring head - CO₂-laser (< 2 Watt; safety class 4); infrared-detector; infrared-optics; option ex-proof

Central processing unit- industrial PC with Pentium Processor; digital film thickness display; interfaces

Software - menu-driven measurement and calibration software



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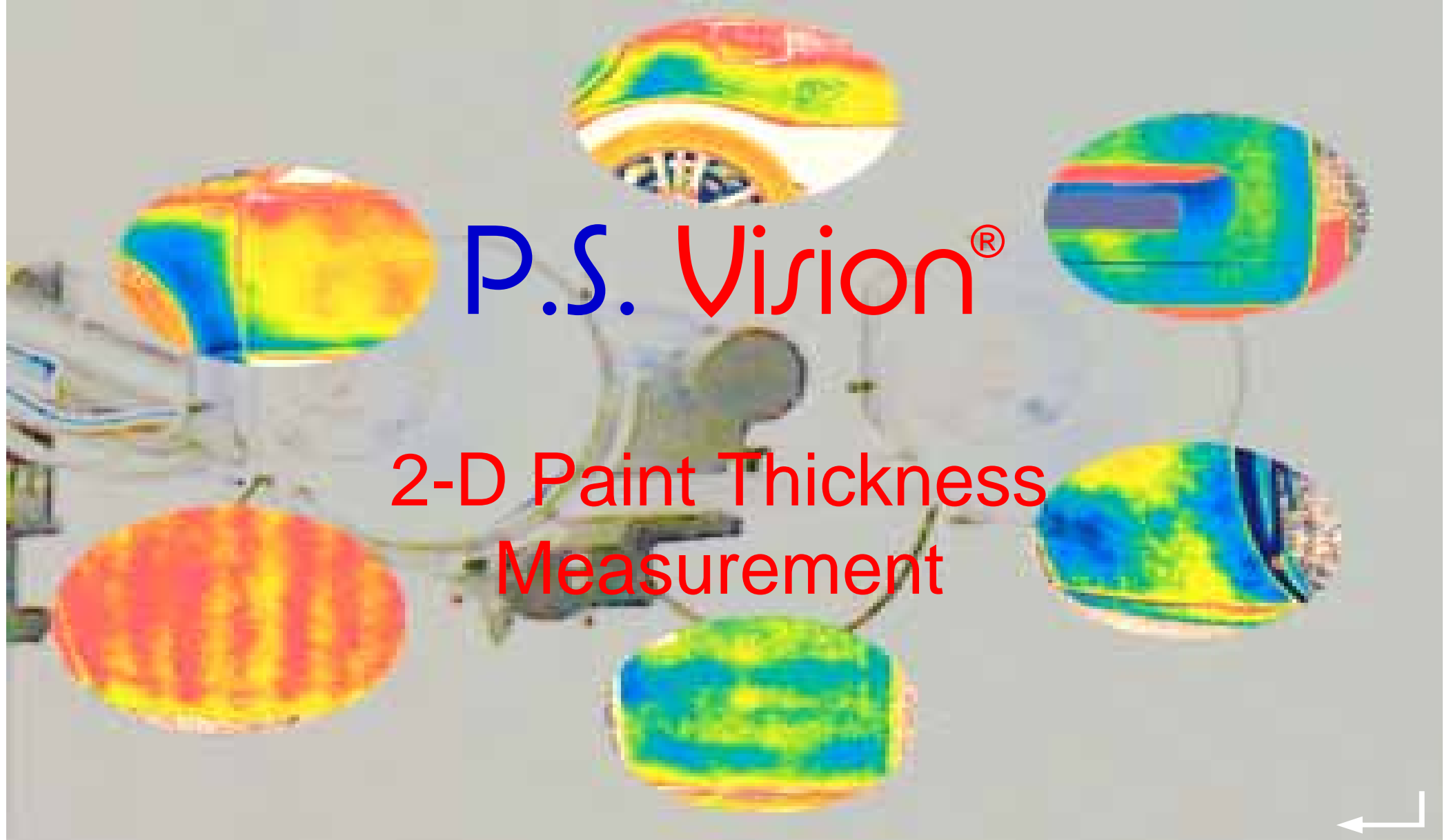
Company	Method	Branch	Benefit	Reference
<p>Car Body</p> 		<p>Adhesives</p> 		<p>ABB Alcan Arcelor EKO Stahl BMW Daido Kohan Dürr ELVAL Euramax Hokkai Koki Hydro Aluminium JSN Jyi Shyang Marcegaglia S.p.A. Nishin Seiko Nittetsu Hokkaido</p>
			<p>Coil Coating</p> 	<p>Control Novelis PSA Rittal Salzgitter Sumitomo Gotec Group Thyssen Krupp Trelleborg Vibracoustic Voest Alpine ZF Boge ...</p>



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P.S. Vision[®]

2-D Paint Thickness Measurement



Mobile Unit



Robot mounting*



*photomontage

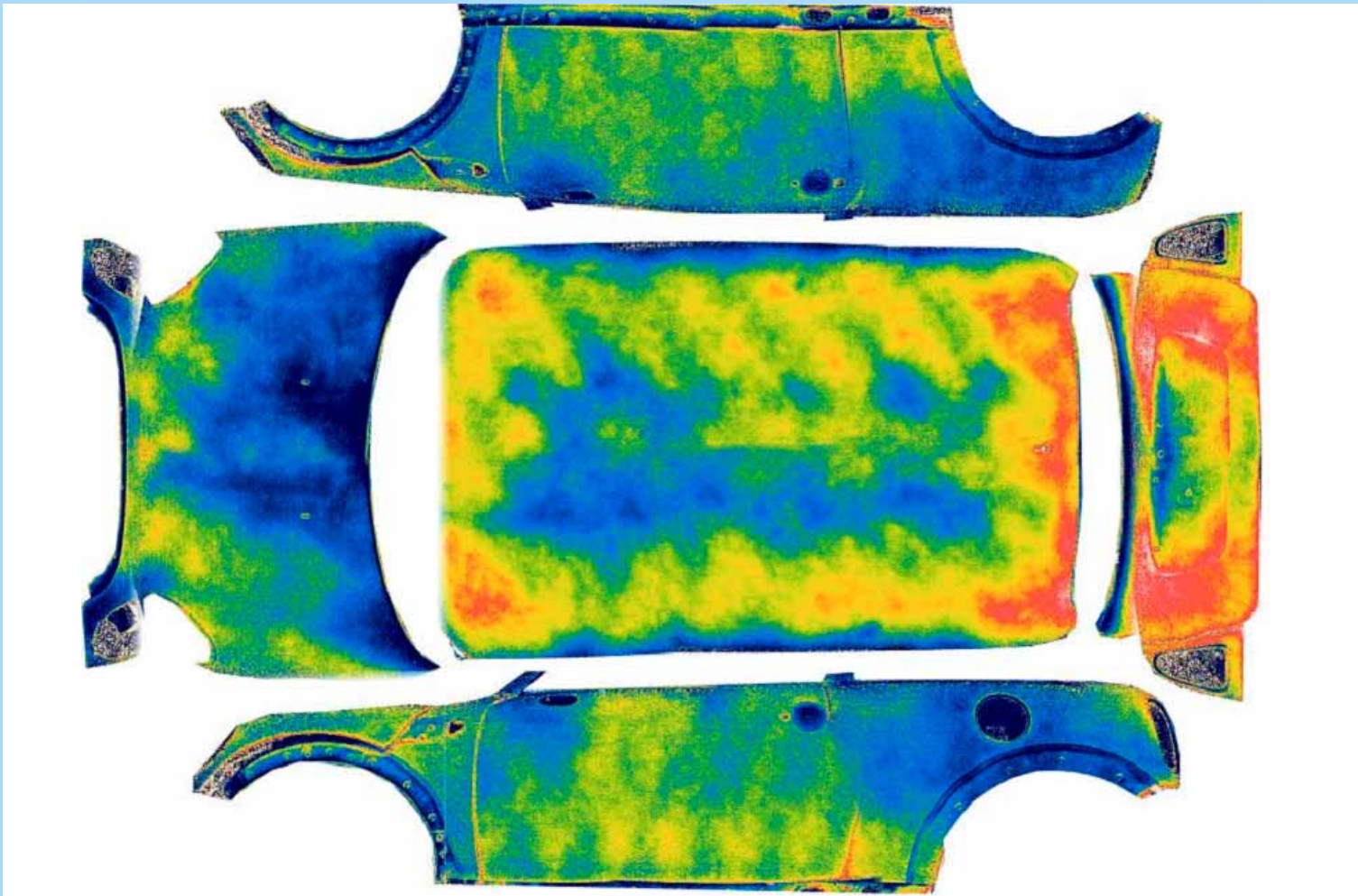


Performance data (approx. values)

- Meas. time: 0,2 s
- Evaluation: 2-3 s
- Meas. area: ~ 0,5 m² / flash
- Flash rate: 10/min
- Spatial resolution: 2-5 mm
- Depth resolution: ~ 1 μm
- Paint condition: dry or wet



Carbody Basecoat



Film-Thickness

