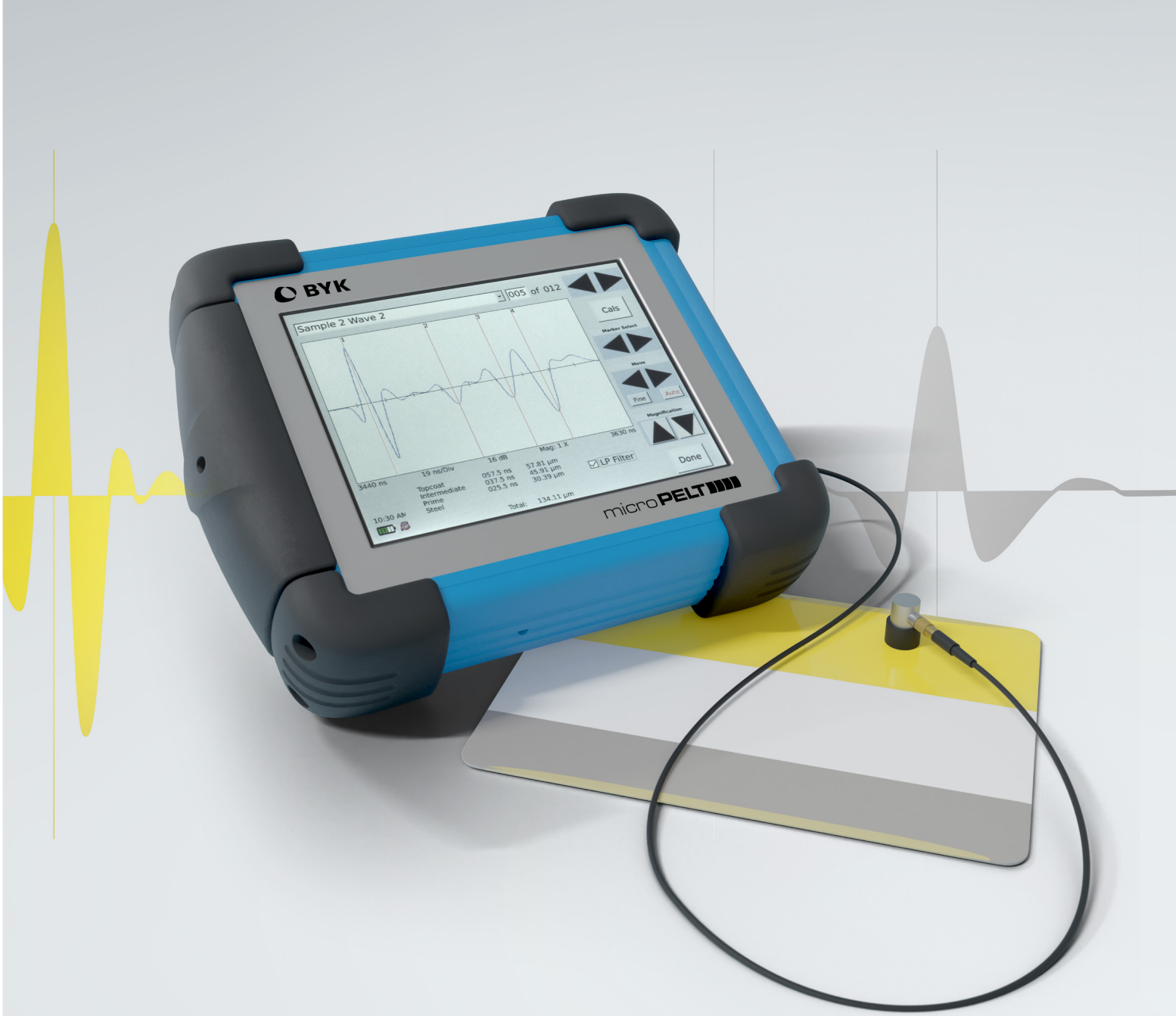
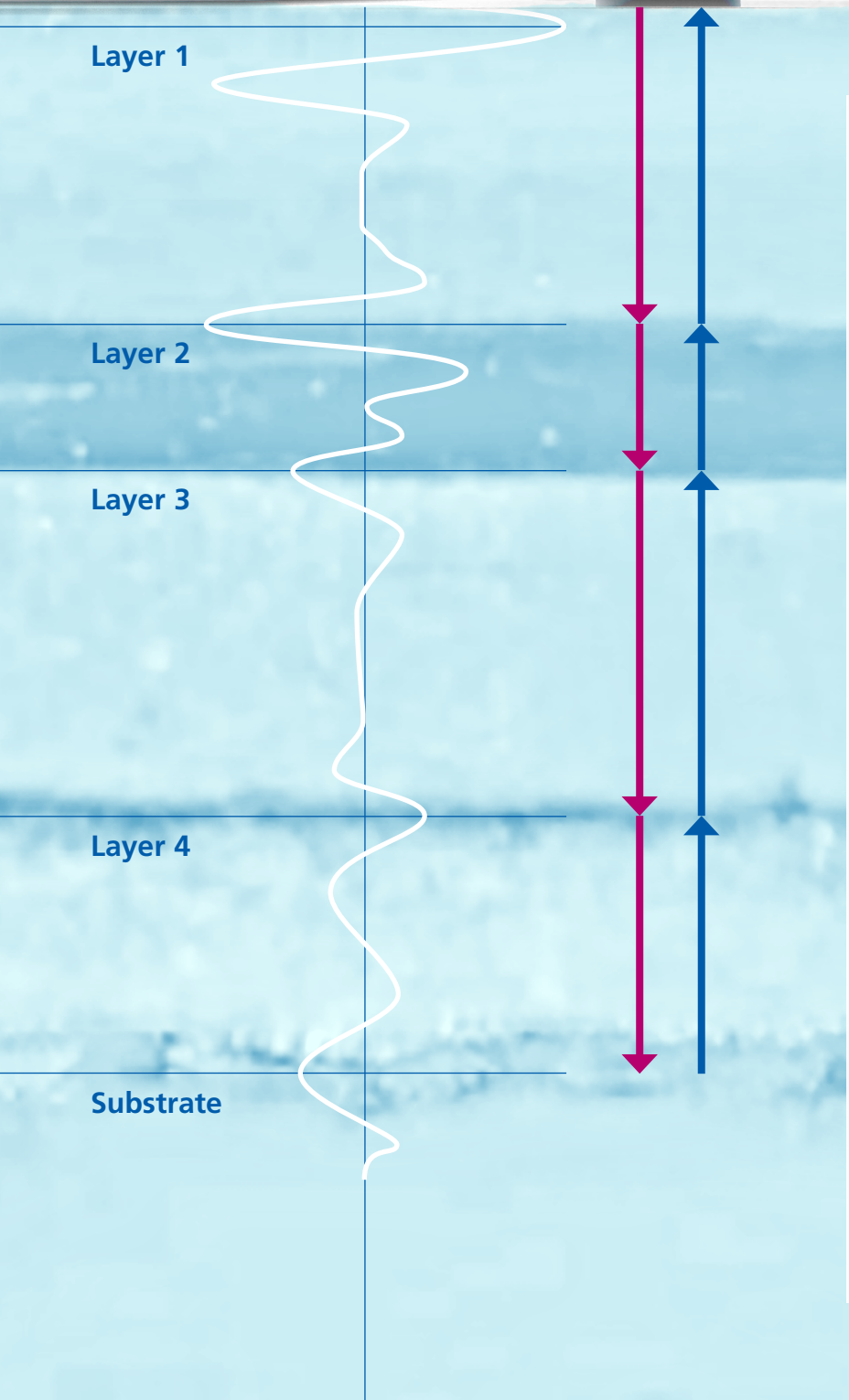


Multi-layer film thickness measurement for any substrate

Accurate echoes from layer to layer

A member of ALTANA

BYK



Film thickness variations have a significant impact on paint durability, color and appearance harmony.

Accurate monitoring will avoid excess material usage. Multi-layer systems could only be measured accurately using destructive methods combined with a high-cost microscope which is very time consuming and requires expert knowledge. This has changed with the BYK-PELT® family and its innovative ultrasound technology – with a single measurement the thickness of each layer in a multi-layer stack is measured – of course non-destructive and with highest precision.

PELT: **P**ulse **E**cho **L**ayer **T**hickness

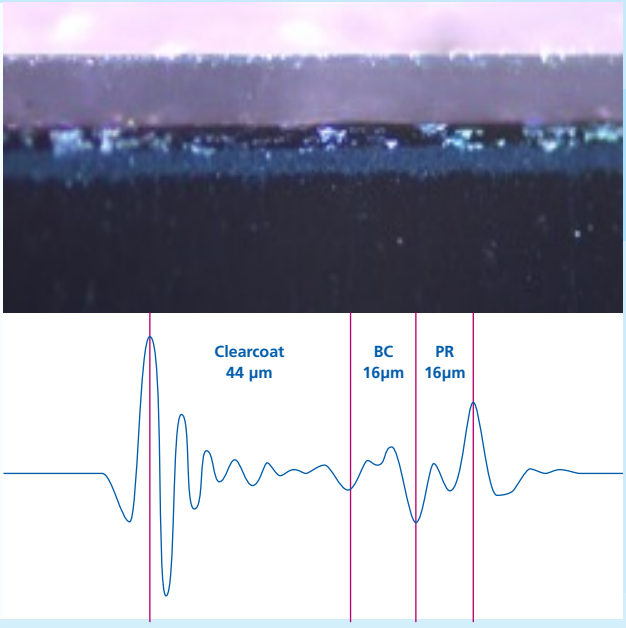
The BYK-PELT gauges use high-resolution ultrasound measurement technology and are in essence acoustic microscopes providing a one-dimensional cross-sectional image through one point on a surface. The ultrasound senses the differences in mechanical or acoustic properties of coatings. A short ultrasonic pulse is sent into the coating layer system. Each time the ultrasonic signal crosses the interface between a pair of layers with differing properties, an echo will be generated. The time between echoes is proportional to the thickness of each coating.

Measure film thickness on virtually any substrate

- Multiple layers of coatings on automotive steel and aluminum body panels.
- Automotive plastic bumpers and other automotive trim components.
- Primer and topcoat systems for construction equipment, railroad locomotives and rolling stock, and high-speed railway equipment.
- Wind turbine blade coatings, shipping container anti-corrosion and topcoat coatings, and marine coatings.
- Paint coatings and lacquers on wood such as cabinetry, furniture, musical instruments, and flooring.
- Laminate coatings and layers.

Color calibration references

To guarantee highest precision BYK-Gardner offers a unique Color Calibration Service. Cross-sections from your specific sample are cut, polished and measured with a high-resolution microscope. The microscope measurements and PELT waveforms are used to generate a calibration file for your colors.



Unsurpassed precision, reliability and long service life – from 5 µm up to 5 mm layer thickness.

Transducers for thin to thick film layers

We have developed novel fabrication techniques to manufacture, bond and assemble very high frequency elements with an unsurpassed precision, reliability and long service life:

- Low frequency transducers for thick layers up to 5 mm
- Medium frequency transducers for layers 18 – 500 µm
- High frequency transducers for thin layers down to 5 µm

The high sensitivity enables the ability to discern lower contrasting layers and the high resolving power facilitates gauging of thinner layers.

Automated film thickness measurements

PELT measurements can be fully automated with BYK-PELT Robotic.

Robotic PELT measurements eliminate location variability and human error, allowing for repeatable, objective measurements from the exact same locations time after time.

With the Robotic PELT, it allows you to monitor and correct near out-of-tolerance conditions and prevent film thickness-related issues from disrupting production.

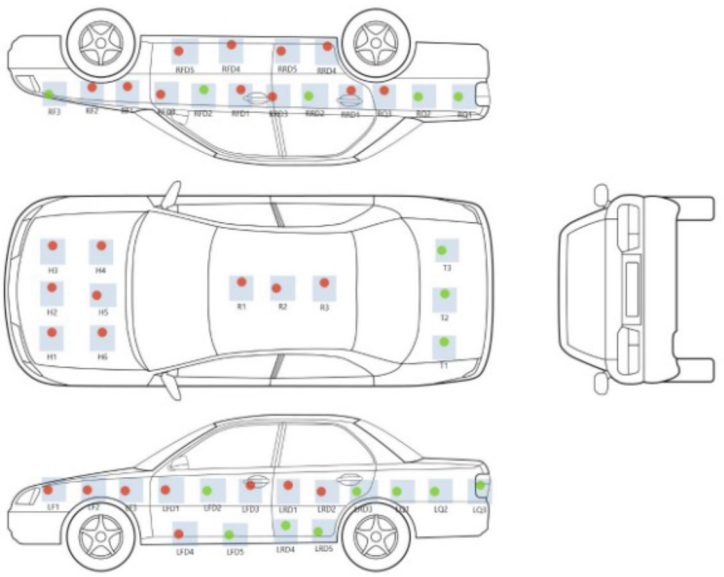
Robotic PELT can measure hundreds of points across dozens of finished bodies every single day.

BYK-PELT systems are a game changer in your quality control saving time and cost with enhanced accuracy and information for optimization you did not have before.

smart-chart for easy and consistent data analysis

Data analysis in smart-chart offers various possibilities to analyze your multi-layer thickness data.

- Standardized test-reports for single car analysis.
- Define your own SPC reports: Thickness variations of selected check zones over time for each layer and total thickness.
- Color Calibration files can be directly imported, and Pass/Fail limits can be set for each layer.
- Define Organizers for standardized operation and clear sample identification.
- BYK-PELT film build data, BYK-mac i color data and wave-scan orange peel data are all saved in the same database for analysis – CLOSE THE LOOP



micro-PELT gauges

Catalog number	94000	94002	94004	94006
Product name	BYK-µPELT 3	BYK-µPELT 3H	BYK-µPELT 5	BYK-µPELT 5+
Measuring range	5–400 µm	80–5000 µm	5–400 µm	5–5000 µm
	0.2–15.7 mil	3.2–196.9 mil	0.2–15.7 mil	0.2–196.9 mil
Repeatability and reproducibility	< 10 % for solvent and waterborne coatings with typical process variation (Varies by layer)			
Accuracy	±1.3 microns or 2 % of the coating whichever is greater.			
Maximum layers	3		5	
Operating temperature	0–40 °C (32–104 °F)			
Dimensions: L × W × H	17.5 x 15 x 5.5 cm (6.9 x 5.9 x 2.2 in)			
Weight	1.18 kg (2.6 lb)			

Delivery Content
BYK-µPELT Gauge, 2 x BYK-µPELT 3,3H,5+ Transducer Cable, SMA (94057), 2 x BYK-µPELT 3,3H,5+ USB Cable to WIN PC (94059), 2 x BYK-µPELT 3, 3H, 5+ Li-Ion Battery (94058), BYK-µPELT Battery Charger all Gauges (94060), BYK-µPELT 3,3H,5+ External Power Supply (94061), BYK-µPELT Case, BYK-µPELT 3, 3H, 5+ Hand Strap Full (94062), BYK-µPELT 3, 3H, 5+ Hand Strap Half (94063), BYK-µPELT 3, 3H, 5+ Neck Strap (94064), 5 x Touch Screen Protective Film (94073), 2 x BYK-PELT Glycerin Couplant, 2 oz. (94050), BYK-PELT Trigger-Spray-Bottle (94052), smart-process Software with 2 Licenses for download (4878), PELT Manager Software for guidewave comparison, PELT Gauge Measurement Accuracy Certificate, 1-Day Training

BYK-PELT transducers

Catalog number	94026	94025	94023	94024	94029	94030	94028	94021
Product name	50B	40B	MB	MC (Robotic)	SMB	20B	M30	M10
Measuring range	5–175 µm	6–200 µm	10–400 µm			18–500 µm	80–750 µm	300–5000 µm
Measuring range	0.20–6.89 mil	0.24–7.87 mil	0.04–15.75 mil		0.39–15.75 mil	0.71–19.7 mil	3.15–29.5 mil	11.8–197 mil
Transducer type	High Frequency	Medium Frequency					Low Frequency	
Curvature radius – convex	≥ 50.8 mm							
Curvature radius – concave	≥ 260 mm			≥ 152.4 mm	≥ 220 mm	≥ 260 mm		≥ 152.4 mm
Transducer dia. with FlexCap	Ø 14.2 mm (0.56 inches)				Ø 12.26 mm (0.48 inches)	Ø 14.2 mm (0.56 inches)	n/a	Ø 14.2 mm (0.56 inches)
Transducer dia. without FlexCap	Ø 11.1 mm (0.44 inches)				Ø 9.28 mm (0.36 inches)	Ø 11.1 mm (0.44 inches)	Ø 6.96 mm (2.7 inches)	Ø 11.1 mm (0.44 inches)

225 026 367 E 2503

measure the visible and beyond.

www.byk-instruments.com