

REFO

Glossmeters for superior Gloss Quality



REFO 3 and REFO 60

Brilliant achievements of LANGE technology

LANGE sets standards in gloss measurement.

LANGE's glossmeters are precision instruments built to the latest state of the art, producing certifiable results as demanded by DIN 67530, ISO 2813, ISO 7668 and BS.

The glossmeters feature an **automatic calibration** system that calibrates the instrument at the touch of a button to the black glass standard A described in ISO 2813 or alternatively, for REFO 3D and REFO 60D, to standard according to ISO 7668.

LANGE's **reference beam technology** guarantees a measurement verified twice.



REFERENCE BEAM TECHNOLOGY

REFO 60



REFO 60/60D - Fundamental gloss

For accurate routine checks.

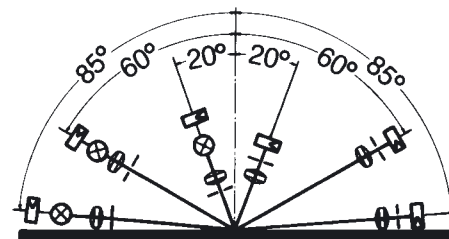
Begin objective gloss measurements with REFO 60. REFO 60 is conceived for accurate gloss measurement during production, i.e. measuring, deciding and correcting while production is in full swing. At the touch of a button the result appears immediately on the display and REFO 60D stores it for later evaluations. This handy glossmeter goes with you to all places of production.

With the 60°-geometry for a wide range of application

The 60° measuring geometry is the best angle for standard gloss measurement from physical and optical points of view. The measuring accuracy in extreme high-gloss and matt ranges is satisfactory for routine purposes.



Additionally, REFO 60D measures metallic surfaces using the metal standard.



The **service schedule** includes an optional annual maintenance service with control of inspection, measuring and test equipment which is documented with a corresponding certificate. This guarantees an optimum measuring accuracy of REFO 3 and REFO 60. Independent. Portable. With a 3-year guarantee.

REFO 3



REFO 3/3D - The gloss professionals

For best flexibility and measuring accuracy.

REFO 3 is an easy-handling portable glossmeter with a three-angle geometry which is perfectly suited to each and every field of gloss measurement: be it in the lower range of matt surfaces (85°-angle), in the mid (60°) or high-gloss range (20°) - it always provides precise and guaranteed results. To measure metal surfaces, REFO 3D is calibrated against the metal standard specified in ISO 7668.

Four modes of operation are at choice:

- One-angle measurement as single or multimeasurement stating also mean value, standard deviation and coefficient of variation.
- Three-angle measurement as single or multimeasurement stating also mean value, standard deviation and coefficient of variation.
- Gloss difference measurement against a reference.
- Gloss gradients can be determined from the continuous gloss measurement mode.

One-button easy operation.

Before starting to measure, press the button to calibrate REFO 3D on the standard. Then measure, read-off, print and evaluate the result.

Measurement memory REFO 3D.

REFO 3D features a data logger to keep all information available for further analysis.



Technical Specifications

International rules and standards

DIN 67 530 · ISO 2813 · ISO 7668 ·
TAPPI T 480 · ASTM D 523 · BS

International Calibration Standard

REFO 3/60: Standard A
REFO 3D/60D: Standard A and Metal Standard

Measuring geometries

REFO 3/3D: 20°, 60°, 85°
REFO 60/60D: 60°

Measuring surfaces

20° approx. 9 x 9 mm
60° approx. 17 x 9 mm
85° approx. 100 x 10 mm

Interface RS 232 C

REFO 3/3D, REFO 60/60 D

Memory for mobile application

REFO 3D: 450 measurements
REFO 60D: 300 measurements

Power supply

REFO /3D: mains/rechargeable batteries
REFO 60/60D: alkalines

Dimensions

REFO 3/3D: 200 x 56 x 80 mm l/w/h
REFO 60/60D: 140 x 40 x 80 mm l/w/h

Weight

REFO 3/3D: 750g
REFO 60/60D: 430g

Guarantee

3 years

Subject to technical modification.