Advancing with Technology ElektroPhysik

Colour Measurement



ColorTest

- portable colorimeter with external probe
- 45°/0° measuring geometry according to DIN 5033
- small probe head, spring-loaded
- automatic/manual start trigger
- simple 4 button menu control
- non-volatile memory for 1,000 colour measurement results and for 100 colour measurement results including remission spectra
- memory for up to 200 colour standards in the gauge
- backlit graphics display
- comprehensive report software

True spectral analysis! New: Pass/Fail tool

Spectrophotometrical Colour Measurement

The colour of an object is not only determined by its surface but also by the incident light. Furthermore, the sensory perception "colour" depends on the observer. Hence, in order to determine a colour difference between two objects, both objects have to be observed under defined lighting conditions at the same time.

The measuring instrument **ColorTest** enables an objective determination of the colour distance between a colour sample and a given colour standard.

ColorTest is based on the spectrophotometric method, which is by far the most precise colour measurement method. The sample is illuminated with a defined light source and the light remitted from the surface is measured spectrally.

Since the surface colours change with the light source, the remission spectrum has to be weighted with a standardized light source. The resulting spectrum is then compared to the three spectra which are based on the sensory perception of red, green and blue of the human visual system to give you the three colour values X, Y and Z.

ΔL	Δ a	Δ b
0.01	- 0.03	0.02
SAVE=I	ENTER	E= 0.04

Display of readings as $\Delta L,\,\Delta a,\,\Delta b$ and ΔE

PASS	DARK 0.17 RED 0.19	
∆ E = 1.05	YELLO 1.02	
SAVE with ENTER		
Pass/Fail Display		

Alike the light sources, the three coloured perceptive functions are standardized for both, a 2° - as well as for a 10° -observation angle. It is necessary to make this distinction because the colour perception depends on the observation angle. The $0^{\circ}/45^{\circ}$ measuring geometry (i.e. measurement at 0° , circular illumination at 45°) conforms to the industrial standard DIN 5033.

COLOUR SYSTEM: ∆E Lab		
Lab ∆E Yxy	HLab	
Luv $\Delta E \Delta E$ Lab	P/F	







Measurement on curved surfaces with straylight compensation

Field of applications

Designed for use on the production floor and for quality conformance inspection, **ColorTest** has proved to be the ideal instrument for a wide range of applications:

- quality inspection (to reduce reject rates to a minium)
- colour measurement and recording to comply with QM-systems according to DIN EN ISO
- colour distance measurement (sample versa reference standard)
- measurement of absolute colour (values of a sample within a preselected colour system and with selected type of standard illumination and observation angle)
- Evaluation of measured colour information (optional report software)



L*a*b* display with tolerance limits

Adjustable Colour systems

Product advantages

True spectral analysis, high repeatability and excellent cost-performance together with a comprehensive report software – all these features make **ColorTest** an indispensable and powerful tool for quality control. Other features at a glance:

external, spring-loaded probe with automatic start trigger enables measurement of small probes at any angle

ColorDaTra Report Software

The **ColorDaTra Report Software** can be highly recommended as an indispensable option. This Windows[®] based PC data base software is used for transferring data and offers the following features:

- Data transfer from ColorTest to a PC or laptop
- Data base for management of colour values and their spectral information
- Graphical display of colour coordinates and colour differences related to stored colour standards in the various colour systems such as CIE L*a*b* colour system
- Trend function
- Quality-check function with selectable colour distances ΔE and Pass/Fail marking in the measuring report

- Non-volatile memory for 1,000 colour measurement results and for 100 colour measurement results including remission spectra and 200 colour standards
- straylight function for compensating any surrounding light when measuring on curved samples
- serial data transmission



- Statistics function with mean, standard deviation, maximum range and printing function for graphics and measuring report
- Read-out of colour standards from ColorTest, changing name and transferring colour standards into ColorTest



Colour Data Report

ColorTest – colour measuring gauge

Supply schedule

The standard **ColorTest** supply schedule includes the following:

- spectrophotometric ColorTest instrument with flexible 45°/0° probe head
- NiMH rechargeable battery pack 6V/1,100mAh
- temperature secured charging station 100 ... 240 V, 50/60 Hz AC
- white reference standard with calibration certificate of the Federal Institute for Material Research and Testing (BAM), Berlin, Germany
- CD-ROM with interactive instruction software and demo-version of report software ColorDaTra (upgradeable to full version with software-licence key)
- operating instructions
- foam padded plastics carrying case

Hardware options

For the daily use a working white reference standard with glazed surface is available. This standard can be easily cleaned and is robust against wear. Further hardware options:

- Additional NiMH rechargeable battery pack 6V/1,100mAh
- Sample holder for measuring powder and clear liquids – optionally with axially light source
- Precision support for reproducible measurements on smaller samples
- Carrier case

Gauge software options

As an option, the following gauge software features can be cleared:

- Multiple sampling with automatic averaging
- Metameric index according to DIN 6172
- Pass/Fail indicator with two thresholds
- Algorithm for powder and liquid measurement

Software options

ColorDaTra data base software

Further instruments from our range of products

- Coating thickness gauges
- Ultrasonic coating thickness gauges
- Porosity detectors
- Wall thickness gauges
- Gloss meters
- Hardness and roughness testers
 - On-line thickness measurement systems for flat materials
 - Continuous pinhole detectors

Technical Data		
Measuring geometry:	45°/0°-circular illumination at 45°, measurement at 0° according to DIN 5033	
Standard illumination:	D65, D55, A, C	
Standard observer:	2° (1931) and 10° (1964)	
Colour systems:	XYZ, Yxy, $\triangle E CIE L^*a^*b^*$, $\triangle L \triangle a \triangle b$, $\triangle E CIE L^*u^*v^*$, Hunter Lab	
Spectral range:	400 nm to 700 nm	
Spectral resolution:	10 nm (internal 3.5 nm)	
Repeatability	$\Delta E \leq$ 0.2 (Range tested by 10 measurements with the delivered white standard)	
Light source:	Light emitting diodes*	
	*ColorTest is not suitable for measuring fluorescent samples	
Power supply:	NiMH 6 Volts/1,100 mAh, up to 1,000 charging cycles	
Display:	Relative or absolute values or remission spectrum	
Ambient temperature:	1535 °C	
Air humidity:	Maximum 85 %, not condensing	
PC-interface:	Serial data transfer via RS 232C	
Weight:	600 g incl. battery-pack	





ElektroPhysik

Pasteurstr. 15 D-50735 Köln Tel.: +49 (0) 221 7 52 04-0 Fax: +49 (0) 221 7 52 04-67 www.elektrophysik.com info@elektrophysik.com ElektroPhysik USA 770 West Algonquin Rd. Arlington Heights IL 60005 Phone: +1 847 437-6616 Fax: +1 847 437-0053 www.elektrophysik.com epusa@elektrophysik.com **ElektroPhysik Nederland** Borgharenweg 140 6222 AA Maastricht Tel.: + 31(0)43/3 52 06 60 Fax: + 31(0)43/3 63 11 68 www.elektrophysik.com epnl@elektrophysik.com

ElektroPhysik Belgium

Allée Marie Louise 4b 4121 Neupré Tél.: + 32(0) 4 336 52 05 Fax: + 32(0) 4 338 0180 www.elektrophysik.com epbe@elektrophysik.com