

BRIGHTNESS AND COLOR METER

68-50



The model **68-50 Brightness & Color Meter** makes measurement of brightness, color and opacity affordable in Production and QC applications. The Brightness & Color Meter measures color, color purity, degree of yellowness, degree of whiteness, color matching and color fastness. The TMI Brightness and Color Meter operates in accordance with CIE Publication No. 15.2 “Standard of Colourimetry” and was designed to meet ISO, ASTM, TAPPI and other International Standards.

APPLICATIONS

Applications of the instrument include paper, pulp, packaging, nonwoven, textile dyeing and printing, color printing, construction materials and ceramics, chemicals, paints, medicines, food, recycled pulp products and mineral industries.

FEATURES

- Large alpha-numeric display
- Single-button simplicity of operation
- RS-232 data output
- Stores up to 99 readings; auto-calculates mean value
- Built-in printer

The Brightness and Color Meter can be used to measure:

- Color parameters, color differences between two samples for objective comparisons.
- The degree of whiteness of a sample sheet to evaluate light scattering coefficient, absorption coefficient, degree of opacity yellowness.
- The instrument can assess the degree of color changing and staining in textile color fastness.
- The unit adjusts UV-content in radiation channel, thus enabling the users to adjust the UV-content in the light source of the instrument to measure ISO brightness values, whiteness values and colorimetric values.
- The 68-50 includes infrared spectrum R_{950} functions to measure residual ink concentration of recycled paper according to TAPPI T 567. ERIC- Effective Residual Ink Concentration can be reported as unit less or as parts per million (ppm)
- This instrument can also be used for quality control on products, color control and measurement for document and antique restoration as well as export and import commodity examination



SPECIFICATIONS

- CIE 1931 (2 degrees) • CIE 1964 (10 degrees)
- ISO 2469, 2470, 2471
- ISO 5631.1 • ISO 9416
- Tristimulus values: <1.00
- Chromaticity coordinates: <0.0100
- Xenon lamp provides diffused illumination in 30mm window in 150mm dia integrating sphere
- Illumination observation condition: Illumination d/o according to ISO 2469 is adopted, i.e. integrating sphere (150mm in diameter) diffused illumination on sample with vertical reception.
- Color measurement standard: Tristimulus values, CIE 1964/10° and CIE 1931/2° standard observer.
- Light source for colour measurement: Pulsed xenon lamp to simulate illuminant D65 and C, instantaneous illumination on sample with UV regulator.
- Measurement port: 30mm in diameter.
- Precision of displayed value: Tristimulus values 0.01, chromaticity values 0.0001, remainder 0.01.
- Stability of measurement value: For 25 times continuous measurements floating $\delta=0.10$. Continuous work for 30 min. floating $\delta=0.20$.
- Repeatability of colour difference measurement: $\Delta E^* < 0.10$.
- Accuracy: Tristimulus values =1.00
Chromaticity coordinates =0.0100
R457 value =0.80
- Repeatability : $\delta x, \delta y = 0.0100$.
- Value difference between different instruments: $\Delta E^* = 0.30$.
- Data outputs: Displays symbol and values through VFD screen and prints out colorimetric parameters on a micro-printer.
- Preset number of operation: Allows user to preset 0-30 sample measurements and calculate their arithmetic mean automatically.
- Preheating of instrument: 10 minutes.
- Environment required in using the instrument:
For general use:
Room temperature 5~35°C
Relative humidity =85%
Power 220V±10%, 50Hz or 110V±10%, 60Hz

PHYSICAL SPECIFICATIONS

Model 68-50-00-0001

Electrical: Specify voltage requirements when ordering

D x W x H: 584 mm x 279 mm x 483 mm (23 in x 11 in x 19 in)

Weight: 32 kg (70 lb)

COLOUR MEASUREMENT SYSTEMS AVAILABLE	
X,Y,Z	CIE1964(10°) D65 tristimulus values.
Y, x, y	1964(10°) chromaticity coordinates.
L*,a*,b*	CIE 1976 uniform colour space
C*, h*, Wb, Wy	Hue, hue angle, whiteness value for porcelain (GB/T1503-92)
$\Delta L^*, \Delta a^*, \Delta b^*$	Colour difference between two samples.
$\Delta E^*, \Delta C^*, \Delta H$	Total colour difference and chromaticity difference and hue difference of CIE 1976 a. b .
ERIC	Effective Residual Ink Content. TAPPI T567pm-97 ISO/TC6/WG3/ N1116.
$\lambda D, P_e, P_c$	Dominant wave length, excitation purity, colorimetric purity.
L, a, b	Hunter's uniform colour space (condition of colour difference formula is D65/10°).
$\Delta L, \Delta a, \Delta b$	Difference of L a b in Hunter's colour space.
ΔE	Colour difference (Hunter).
R457, YI, ΔYI	Whiteness, yellowness, change of yellowness (defined by ISO committee TC6).
Rx, Ry, Rz	Primary colours: red , green and blue.
O, Sc, Ab	Opacity, light scattering coefficient and optical absorption coefficient defined by ISO2471.
WH1, WH2, WH3	Whiteness values calculated from 3 Hunter's whiteness formulae.
W86, Tw	Whiteness value from CIE 1986 neutral whiteness formula and hue value from pale hue Formula.
W _r , W _g	Whiteness value from CIE yellowish and greenish whiteness formulae
W _b , W _t , W _{sp}	Whiteness value from Berger, Taube and Stephanson whiteness formulae
W _c , W _{ct} , W _{sb}	Whiteness value from Croes, China Textile and Stensby whiteness formulae.
W _{g1} , W _{g2} , W _{g3}	Whiteness value from Ganz three whiteness Formulae.
CS, SS	Colour difference assessment calculated for fastness to colour change and fastness to staining formulae.
DE1, DE2, LSd	CMC small colour difference and luminosity of 1/1 standard depth.
W _{cbg} , T _{wc} , ΔW	Whiteness, hue value and whiteness difference between two samples from CIBA's formulae

STANDARDS

Paper, board and pulps

ISO 2469:1994	Paper, board and pulps – Measurement of diffuse reflectance factor
ISO 2470:1999	Paper, board and pulps – Measurement of diffuse blue reflectance factor (ISO brightness)
ISO 2471:1998	Paper and board – Determination of opacity (paper backing) – Diffuse reflectance method.
ISO 5631:2000	Paper and board – Determination of colour (C/2 degrees) – Diffuse reflectance method.
ISO 9416:1998	Paper – Determination of light scattering and absorption coefficients (using Kubelka - Munk theory).
ISO 11475:1999	Paper and board – Determination of CIE whiteness, D65/10 degrees (outdoor daylight).
ISO 11476:2000	Paper and board – Determination of CIE whiteness, C/2 degrees (indoor illumination conditions).
TAPPI T567pm-97	Effective Residual Ink Content (ERIC)

Paints and varnishes

ISO 7724-1:1984	Paints and varnishes – Colorimetry – Part 1: Principles.
ISO 7724-2:1984	Paints and varnishes – Colorimetry – Part 2: Colour measurement.
ISO 7724-3:1984	Paints and varnishes – Colorimetry – Part 3: Calculation of colour

Textiles

ISO 105-A04:1989	Textiles – Tests for colour fastness – Part A04: Method for the instrumental assessment of the degree of staining of adjacent fabrics.
ISO 105-A05:1996	Textiles – Tests for colour fastness – Part A05: Instrumental assessment of change of colour for determination of grey scale rating.
ISO 105-A06:1995	Textiles – Tests for colour fastness – Part A06: Instrumental determination of 1/1 standard depth of colour.
ISO 105-J01: 1997	Textiles – Tests for colour fastness – Part J01: General principles for measurement of surface colour.
ISO 105-J02:1997	Textiles – Tests for colour fastness – Part J02: Instrumental assessment of relative whiteness.

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