

Elcometer 6060/4 964 Portable 0/45 Spectrophotometer



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The Elcometer 6060/4 has all of the functionality of the Elcometer 6060 plus tighter inter-instrument agreement and JOB capability. The JOB function is a programmed sequence of specific steps to assist the operator in the colour measurement process. Up to six lines of specific instructions per measurement routine can be downloaded from X-Rite software and displayed on the LCD

- Lightweight, compact, portable instrument
- 0/45 optical geometry
- 0.15 ΔE^*ab inter-instrument agreement
- Interchangeable apertures for 4mm, 7mm or 15mm measurement area available
- Large, easy-to-read graphical LCD display
- JOBS and PROJECT operation modes
- Opacity and colour strength measurement
- Reflectance curve graphics display
- Flip-back target shoe for flexible use
- Rugged construction
- Rechargeable battery for remote use.

Appearance

Appearance measurement is a way of putting numbers to characteristics of surfaces that we see. The ability to independently quantify appearance allows for products to be similar whenever and wherever the product is manufactured or coated.

Elcometer provide a comprehensive range of hand held instruments to measure most of the individual characteristics that generate the overall appearance of a material or coating.

Gloss

The ability of a surface to reflect light without scattering is known as Gloss. Gloss is measured by directing a constant power light beam at an angle to the test surface and then by monitoring the amount of reflected light. Different surfaces require different reflective angles. Elcometer Glossmeters cover the range necessary to measure almost any surface from high gloss to matt, from large to small surfaces - flat or curved

Haze

Some materials appear to have considerable difference in gloss yet give comparable readings when measured with a glossmeter at one angle. These materials can be separated by measuring at a second angle and comparing the difference of the two readings. Haze is defined by ASTM D4039 as the difference between gloss at 60° and the gloss at 20°.

KEY FEATURES

Measuring Functions and Indices

The 964 provides absolute and difference measurements for the following colourmetric systems. These values can be obtained from any of the nine illuminants with 2° or 10° observer angle: CIE XYZ, CIE Yxy, CIE LAB, Hunter LAB, CIE LCH, CMC and CIE94. Whiteness and Yellowness per ASTM E313-98, Metamerism Index and DIN 6172.

Special JOB and PROJECT Modes

The JOB function is a programmed sequence of specific steps to assist the operator in the colour measurement process. Up to six lines of specific instructions per measurement routine can be downloaded from X-Rite software and displayed on the 964's LCD screen. Multiple colour standards can also be collected under an identified PROJECT, a feature that supports corporate color standards programs.

Pass/Fail Mode

The 964 stores up to 1,024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the instrument's LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

Interchangeable Apertures

The internal apertures can be quickly changed for 4mm, 7mm or 15mm measurement areas. This allows the operator to change measurement area quickly and efficiently, depending on sample size.

Inter-Instrument Agreement

The 964 has superior inter-instrument agreement – essential in multiple instrument colour-control programs. The 964 offers excellent inter-instrument agreement with X-Rite's 968 0/45 spectrophotometer. Both input data into X-Rite's line of Windows-based colour quality assurance and colour formulation software.

Opacity, Colour Strength and Shade Sorting

The 964 can measure opacity as well as three colour-strength options: chromatic, apparent and tri-stimulus calculations. The 964 also performs 555 shade sorting. These are important considerations in the colour quality control of manufactured products involving plastics, painted or textile materials.

User-Friendly Ergonomics

A wrist strap and tactile side grips make the instrument easy to hold. Read-outs are large and easy to see. A rechargeable battery pack allows extended operation of the instrument.

Options include:

- Remote battery charger
- Rigs & Jigs (fixtures and accessories for standardized measurement of product samples)
- Replacement rechargeable battery packs
- Turnkey systems
- Quality Assurance and Control Software
- Colour formulation software
- UV filter 968-61-08
- Extended service and support plans

Shade

This is the measurement of darkness or lightness of a surface. Only shading is measured, irrespective of colour, and is referred to as 'whiteness'. The test surface is illuminated at an angle of 45° and the intensity of scattered light at the perpendicular (0°), is measured on a grey scale where black is 0% and white is 100%.

Opacity

This is the degree to which a coating will obscure the surface to which it has been applied. Opacity is measured in a similar way to shade, however opacity, or hiding power, as defined by ISO 2814 involves measuring whiteness of a known film of test material on both a black (less than 5%) and a white (greater than 75%, less than 85%) substrate. A full range of opacity test charts are available – See Leneta Test Charts for further information.

Colour

The ability of a material to absorb certain wavelengths of light and reflect others. For example a black material reflects no light across the complete colour spectrum, whereas a pure white material reflects all of the light. All other colours reflect light at different points of the spectrum. Colour is quantified by the material's Red, Green and Blue (RGB) values.

Measuring Geometrics	d/8°, DRS spectral engine, interchangeable apertures: 4mm measurement area / 6.5mm target window 7mm measurement area / 9mm target window 15mm measurement area / 21.5mm target window	
Light Source	Gas-filled tungsten lamp	
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12	
Standard Observers	2° and 10°	
Detector	Blue-enhanced silicon photodiodes	
Spectral Range	400 – 700nm	
Spectral Interval	10nm – measured, 10nm – output	
Storage	1,024 standards with tolerances, 2,000 samples	
Inter-Instrument Agreement	7mm / 15mm	CIE L*a*b*: Average 0.15 ΔE^*_{ab} based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.30 ΔE^*_{ab} on any tile (specular component included)
	4mm	CIE L*a*b*: Average 0.20 ΔE^*_{ab} based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.40 ΔE^*_{ab} on any tile (specular component included)
Short-Term Repeatability¹	0.05 ΔE^*_{ab} on white ceramic (standard deviation)	
Measurement Range	0 to 200% reflectance	
Measuring Time	Approximately 2 seconds	
Lamp Life	Approximately 500,000 measurements	
Power Supply	Removable (Ni-metal hydride) battery pack	
AC Adapter Requirements	90 – 130VAC or 100 – 240VAC, 50 - 60Hz, 15W maximum	
Charge Time	Approximately 4 hours – 100% capacity	
Measurements per Charge	1,000 measurements within 8 hour period	
Display	128 x 256 pixel graphical LCD	
Data Interface	Patented bi-directional RS232, 300 – 57,000 baud	
Operating Temperature Range	10 to 40°C (50° to 104°F) 85% Relative Humidity Maximum (non-condensing)	
Storage Temperature Range	-20° to 50°C (-4° to 122°F)	
Weight	1.1kg (2.4lbs)	
Dimensions	109 x 84 x 196mm (4.3" x 3.3" x 7.7")	
Supplied with	Calibration Standards, Operating Manual on CD Rom, AC Adapter and Hard-Sided Carrying Case	
¹ Based on 20 measurements on a white tile.		

Model	Description	Part Number		
Elcometer 6060/4	XRITE 962S Portable 0/45 Spectrophotometer - 4, 7 and 15mm	K0006060M004		
		UK 240V	EUR 220V	US 110V
Accessories	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001
	Replacement Rechargeable Battery Pack	KT006075P002		

Related products



Elcometer 6060

The Elcometer 6060 is a versatile 0/45 spectrophotometer, with interchangeable apertures for 4mm, 7mm or 15mm measurement areas. A wrist strap and tactile side grips make the instrument easy to hold. Read-outs are large and easy to see. A rechargeable battery pack allows extended operation of the instrument.



Elcometer 6070

The Elcometer 6070 is the "ultimate" portable multi-angle colour spectrophotometer. Five viewing angles of 15° to 110° allow accurate evaluation of the variation in metallic, pearlescent and special effect paint finishes.



Elcometer 6075/1

The SP60 is an affordable sphere colour spectrophotometer, designed to give fast, precise and accurate colour measurement information on materials ranging from paper and paint to plastics and textiles. Supplied with an 8mm fixed aperture.



Elcometer 6075/2

The SP62 is an affordable sphere colour spectrophotometer, designed to give fast, precise and accurate colour measurement information on materials ranging from paper and paint to plastics and textiles and is supplied with 4mm, 8mm or 16mm fixed apertures



Elcometer 6075/3

The most popular product suitable for most coating applications, the SP64 colour spectrophotometer is fast, accurate and ideal for measuring a wide range of materials. Supplied with a switchable aperture size, the user can select the test area of 4mm or 8mm or it can be supplied with an optional fixed 16mm aperture.



Elcometer 6090

The X-RiteColor® Master Software, has the power to measure, analyse, control and communicate colour data through one sophisticated, yet simple software program that helps you reduce cycle time, create multiple colour formulation matches and increase efficiency of your colour data communication.

ENGLAND

Elcometer Instruments Ltd
Edge Lane
Manchester M43 6BU

Tel: +44 (0) 161 371 6000
Fax: +44 (0) 161 371 6010
e-mail: sales@elcometer.com
www.elcometer.com

USA

Elcometer Instruments Inc
1893 Rochester Industrial Drive
Rochester Hills Michigan 48309

Tel: +1 248 650 0500
Toll free: 800 521 0635
Fax: +1 248 650 0501
e-mail: inc@elcometer.com
www.elcometer.com

CANADA

Elcometer Canada Ltd
PO Box 622, 401 Ouelette Avenue
Windsor, Ontario N9A 6N4

Tel: +1 248 650 0500
Toll Free: 800 521 0635
Fax: +1 248 650 0501
e-mail: ca_info@elcometer.com
www.elcometer.com

ASIA & THE FAR EAST

Elcometer (Asia) Pte Ltd
896 Dunearn Rd
Sime Darby Centre #3-09
Singapore 589472,
Republic of Singapore

Tel: +65 6462 2822
Fax: +65 6462 2860
e-mail: asia@elcometer.com
www.elcometer.com

BELGIUM

Elcometer SPRL
Rue Vallée 13
B-4681 Hermalle /s Ardenteau

Tel: +32 (0)4 379 96 10
Fax: +32 (0)4 374 06 03
e-mail: be_info@elcometer.be
www.elcometer.be

FRANCE

Elcometer SARL
BP 8-Bou
60 Rue de la Petite Levée
45430 Chécy

Tel: +33 (0)2 38 86 33 44
Fax: +33 (0)2 38 91 37 66
e-mail: fr_info@elcometer.fr
www.elcometer.fr

GERMANY

Elcometer Instruments GmbH
Himmlingstraße 18
D-73434 Aalen

Tel: +49 (0) 7366 91 92 83
Fax: +49 (0) 7366 91 92 86
e-mail: de_info@elcometer.de
www.elcometer.de