elcometer®

inspection equipment

DFT
Fineness of
Grind, Density
Flow & Dip Cups
Rotational Viscosity
Flash Point, Impact Testers
Washability & Abrasion Testers
Film Applicators, Bend Testers, Gloss
Thickness Gauges, Surface Profile, Wet Film
Dry Film, Coating Thickness Gauges
Climatic Testing, Adhesion, Pinhole Testers
Porosity, Software, Dispersion, Inspection Kits
Zahn Cups, Motorised Film Applicators
Drying Time Recorders, Washability, Abrasion
Scratch & Hardness, Elasticity & Deformation
Surface Cleanliness, DOI Gloss Meters
Colour, Moisture, Dewpoint Meters
Cross-Hatch, Oven Recorders
Surface Contamination
ElcoMaster™

2013

Table of Contents

Why choose Elcometer?

For more than sixty years Elcometer has been a world leader in the design, manufacture and supply of inspection equipment to the coatings industry.

Ever since the first Elcometer gauge was manufactured in 1947, our philosophy has been to provide 'best in class' design, quality and service at a competitive price. By concentrating on these core values, Elcometer has grown into a global network with representation in over 70 countries.

How to use this catalogue

Elcometer's product range has been separated into 21 distinct categories which are in regular use within the coatings industry.

These product categories featured within the catalogue follow the coating process - from coating development to post application inspection. For more information please contact Elcometer.

Service and Support

Elcometer has over 150 Distributors around the world, all comprehensively trained on our products, providing a full after sales service and support within your region.

With the widest range of own manufactured products, Elcometer can provide a complete solution to all your inspection requirements.

Training

Elcometer offers first class training on all its products to all our customers either at your facility or at our state of the art training facility in Manchester, England. For more information please contact Elcometer.

With a range of products specifically developed to meet the needs of the coatings industry, Elcometer is well positioned to provide you with the solution to your inspection requirements - whatever and wherever they might be.
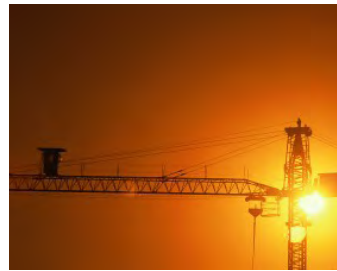
Quality is part of the Elcometer culture

Elcometer's commitment to quality is reflected in our ISO 9000 Quality and ISO 14001 Environmental certifications.

It is the Company philosophy to integrate quality into all aspects of the product - whether it be the initial product design or in our commitment to our customers.

Elcometer is committed to reducing its impact on the environment, both in product manufacture, packaging, catalogue production and waste management. All our products are lead and mercury free and, where required, CE and RoHS compliant.

Certification

Elcometer's products are designed and manufactured to the highest levels of quality ensuring that we can provide relevant certification where necessary.

To meet the various inspection requirements we offer the following certification, dependent on the product:

Certificate of Calibration: issued for Fixed Calibration equipment and shows readings and traceability

Accredited Certificate: can be issued for Fixed Calibration Equipment and a full UKAS traceable certificate is issued from an independent Calibration Laboratory

Certificate of Test: for variable calibration equipment and supplied with readings. A Certificate of Inspection states the instrument is tested in accordance with our procedures.

Fit for Purpose - Standards Explained

All Elcometer products are designed to comply with National and International Standards. We have a team of experts working with Standards bodies around the world, ensuring we have products fit for purpose, exceeding the demands of our customers.

In this catalogue, we have identified the latest National and International Standards - those in Orange are current and those in Grey have been superseded but are still recognised in some industries.

We continuously review our products against current and new Standards and for the most up to date list, visit our online catalogue which provides the latest information on all new, current and superseded Standards which our products can be used in accordance with.
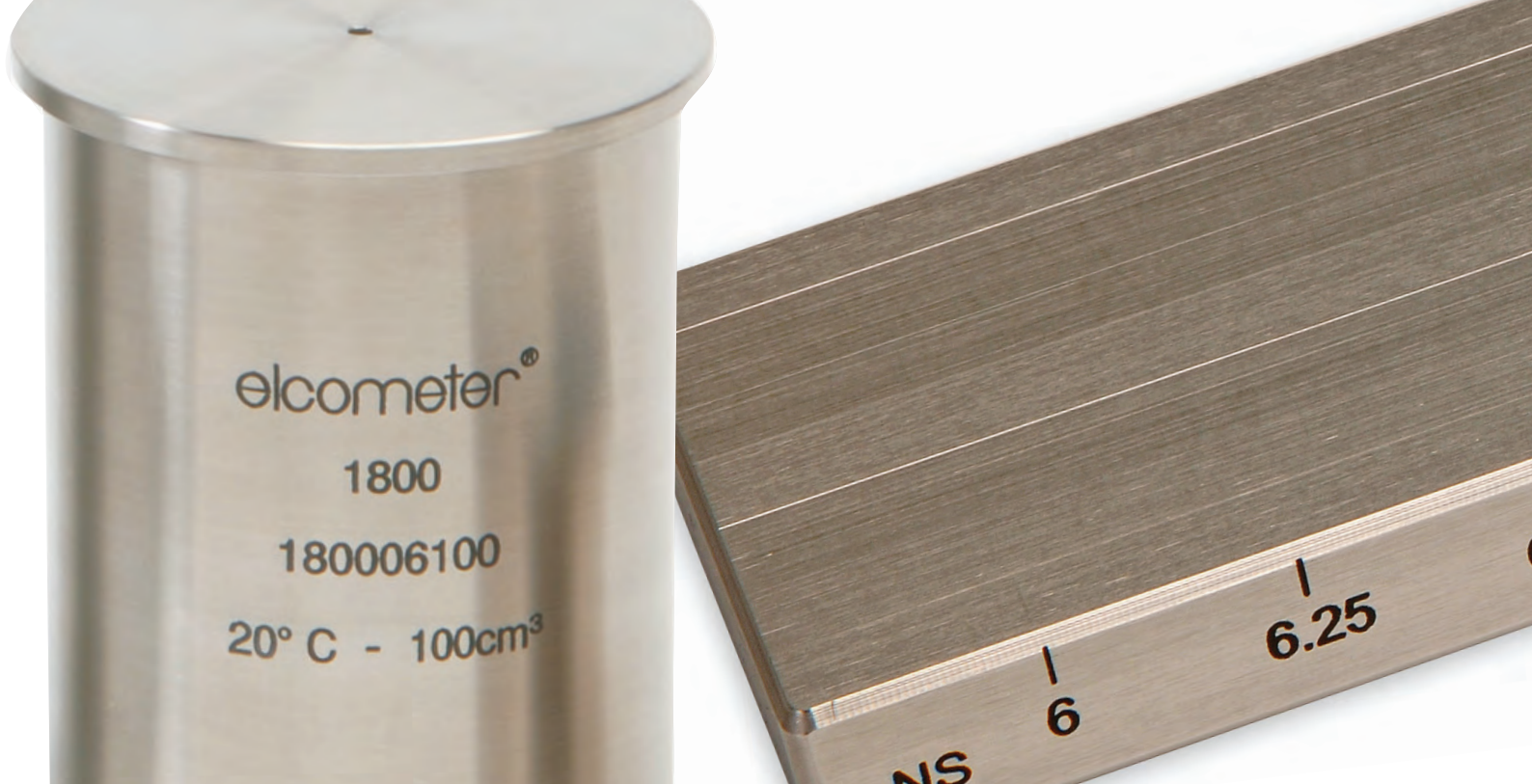
Product Innovation

Elcometer continues to be a leader in product innovation for the Inspection Industries in both hardware and software design with a team of specialists dedicated to product development.

We are committed to continuously push the boundaries through our new product development programmes.

Product Index

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Dispersion & Density

From the development of coatings and inks in the laboratory to testing during the production process, quick and precise measurement of the particle size of the material (Dispersion) and volumetric mass (Density) are essential measurement techniques required for reliable and repeatable formulations.

Elcometer's stringent manufacturing standards ensure that the highest level of precision and quality is maintained for all its gauges in order to comply with the requirements of the industries where the grinding process is involved, particularly in the fields of wet paints and powder, varnishes, printing inks and cosmetics.

Dispersion
Accurately measure the particle size and consist of stainless steel blocks.
The comprehensive range of Elcometer fineness of grind gauges consists of stainless steel blocks with a precision ground scraper. Each block has either one or two channels, precision ground in a uniformly increasing depth from zero at one end to a specified depth at the other, identified by the scale on the gauge.

Density
To maintain consistency of a coating, the Density should remain constant from batch to batch.
Density Cups, also known as Specific Gravity Cups or Picnometers, are used to determine the mass per unit volume (Specific Gravity) of a liquid at a given temperature.

Specific Gravity is defined as the ratio of the density of a given substance to the density of water, when both are at the same temperature.

As the Specific Gravity Cup is an exact measurement of the volume of the liquid, it is imperative that the exact weight of the sample is obtained.

Elcometer offers a range of cups and laboratory balances for accurate measurements during the development of a coating.

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Elcometer 2020 & 2041

Fineness of Grind Gauges

The Elcometer 2020 & Elcometer 2041 Fineness of Grind Gauges are used to determine the particle size and fineness of grind of many materials including paints, pigments, inks, coatings, chocolates and other similar products.

These two channel gauges, together with the scrapers, are made of hardened stainless steel and have two grooves with a graded slope (dependent on the model chosen). Graduated in microns, mils, NS (Hegman) or PCU (North), the gauges have a tolerance of ±2μm (0.08mil). The groove width for all models is 12mm (0.47") with a groove length of 127mm (5.0").

STANDARDS:
ASTM D 1210, AS/NZS 1580.204.1
DIN 53203, EN 21524,
FTMS 141 4411.1, ISO 1524,
JIS K 5600-2-5, NF T30-046

Technical Specification

Part Number Metric	Imperial	Model	Range (µm)	Range (mils)	Graduation (µm)	Graduation (mils)	Hegman (NS)	North (PCU)	Certificate
K0002041M001	-	Elcometer 2041/1	0 - 15	-	1	-	8 - 7	10 - 9	○
K0002041M002	K0US2041M002	Elcometer 2041/2	0 - 25	0 - 1	2.5	0.1	8 - 6	10 - 8	○
K0002041M003	K0US2041M003	Elcometer 2041/3	0 - 50	0 - 2	5	0.2	8 - 6	10 - 8	○
K0002041M004	K0US2041M004	Elcometer 2041/4	0 - 100	0 - 4	10	0.5	8 - 6	10 - 8	○
K0002020M003	-	Elcometer 2020/3	0 - 15	-	1	-	8 - 7	10 - 9	○
K0002020M004	K0US2020M004	Elcometer 2020/4	0 - 25	0 - 1	2.5	0.1	8 - 6	10 - 8	○
K0002020M001	K0US2020M001	Elcometer 2020/1	0 - 50	0 - 2	5	0.2	8 - 4	10 - 5	○
K0002020M002	K0US2020M002	Elcometer 2020/2	0 - 100	0 - 4	10	0.5	8 - 0	10 - 0	○
Packed Dimensions		180 x 40 x 12mm (7.1 x 1.6 x 0.5")							
Packed Weight		1.36kg (3lb)							
Packing List		Elcometer 2020 or Elcometer 2041 Fineness of Grind Gauge, scraper, plastic case and operating instructions							

Accessories

KT002020N001	Replacement Scraper for Elcometer 2020
KT002030N001	Replacement Scraper for Elcometer 2041

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0002041M001 is the certificate for model K0002041M001.)

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High Precision Grindometer

Elcometer 2050

This precision gauge is used to determine particle size and fineness of grind for many materials including paints, pigments, inks, coatings, chocolates and other similar products.

The gauge and its scraper are made of hardened stainless steel and are graduated in microns on the top to an accuracy of ±1µm (0.04mil).   The groove width is 12mm (0.47") and the groove length is 200mm (7.87").

The high precision Grindometer has a single groove.

STANDARDS:
ASTM D 1210, AS/NZS 1580.204.1
DIN 53203, EN 21524,
FTMS 141 4411.1, ISO 1524,
JIS K 5600-2-5, NF T30-046

Technical Specification C

Part Number Metric	Imperial	Model	Range (µm)	(mils)	Graduation (µm)	(mils)	Certificate
K0002050M001	K0US2050M001	Elcometer 2050/1	0 - 25	0 - 1	1	0.05	○
K0002050M002	K0US2050M002	Elcometer 2050/2	0 - 50	0 - 2	2	0.1	○
K0002050M005	K0US2050M005	Elcometer 2050/5	0 - 100	0 - 4	5	0.2	○
K0002050M008	K0US2050M008	Elcometer 2050/8	0 - 250	0 - 10	12.5	0.5	○
Tolerance	±1µm (0.04mil)						
Packed Dimensions	250 x 40 x 15mm (9.8 x 1.6 x 0.6")						
Packed Weight	1.45kg (3.2lb)						
Packing List	Elcometer 2050 High Precision Grindometer, scraper, plastic case and operating instructions						

Accessories

KT002030N001	Replacement Scraper for Elcometer 2050

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0002050M001 is the certificate for model K0002050M001.)

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Elcometer 2070

NPIRI Fineness of Grind Gauge
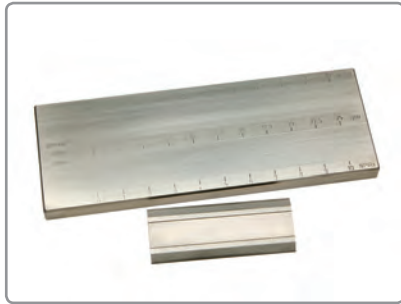
This precision gauge is used to determine particle size and the fineness of grind of particles in printing inks.

The NPIRI gauge and its scraper are made of hardened stainless steel and the gauge has two grooves with a gentle slope.

The groove width is 25mm (0.98") and the groove length is 165mm (6.5"). The NPIRI scale is displayed alongside the microns scale.
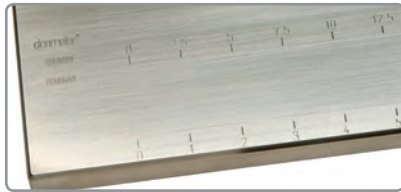
STANDARDS:
ASTM D 1316

Technical Specification · C

Part Number		Model	Range		Graduation		Certificate
Metric	Imperial		(µm)	(mils)	(µm)	(mils)	
K0002070M001	K0US2070M001	Elcometer 2070	0 - 25	0 - 1	2.5µm / 1 NPIRI	0.1mil / 1 NPIRI	○
Packed Dimensions		220 x 80 x 12mm (8.6 x 3.1 x 0.5")					
Packed Weight		2.2kg (4.8lb)					
Packing List		Elcometer 2070 NPIRI Fineness of Grind Gauge, scraper, plastic case and operating instructions					

Accessories

KT002070N001	Replacement Scraper for Elcometer 2070

How to use a Fineness of Grind Gauge

The material is placed on the deepest part of the groove and, using the scraper provided, drawn up the slope - the particle size is indicated where the material stops.
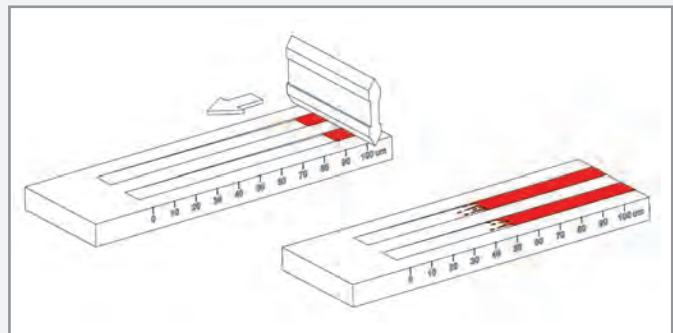
○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0002070M001 is the certificate for model K0002070M001.)
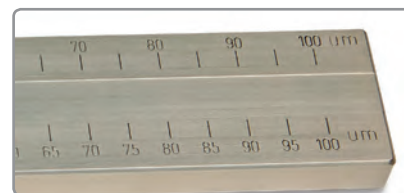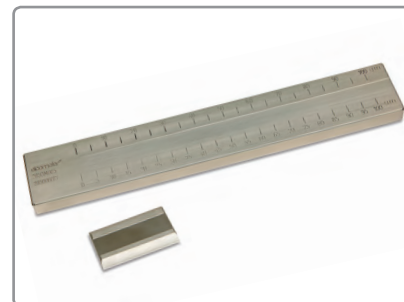
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Density Cup

Elcometer 1800

The Elcometer 1800 is a stainless steel precision cup for determining the specific gravity or density of paints and similar products.

The density cup consists of a cylindrical container and lid with a hole for the exhaust of excess liquid.

STANDARDS:

ASTM D 891-B, ASTM D1475, DIN 53217-2, FTMS 141 4183, ISO 2811-1, JIS K 5600-2-4, NBN T22-110, NFT 30-020

Technical Specification   C

Part Number	Description	Volume/ Capacity	Certificate
K0001800M001	Elcometer 1800/1 Density Cup stainless steel	50cc	
K0001800M002	Elcometer 1800/2 Density Cup stainless steel with calibration certificate	50cc	●
K0001800M005	Elcometer 1800/5 Density Cup stainless steel	100cc	
K0001800M006	Elcometer 1800/6 Density Cup stainless steel with calibration certificate	100cc	●

How to use a Density Cup:

- Weigh the Cup when empty
- Fill with the liquid
- Place lid on the Cup, removing excess coating*
- Weigh the Density Cup when full
- Divide the weight by the cup volume/capacity to determine the Specific Gravity

*Each Cup has an escape hole in the lid to allow excess liquid to escape. Any excess liquid should be removed before weighing.

The formulae for calculating Density and Specific Gravity are:

$$\text{Density} = \frac{\text{Weight}}{\text{Unit Volume}}$$

Note: 50cc = 50cm³ = Volume
100cc = 100cm³ = Volume

$$\text{Specific Gravity} = \frac{\text{Density of the Material}}{\text{Density of Water at the Same Temperature}}$$

● Certificate supplied as standard.

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Elcometer 8720

Compact Balance

The Elcometer 8720 KB is a compact, low cost balance which offers extensive weighing functions selectable by the user.

There are two models available in two scale ranges. The Elcometer 8720/1 and Elcometer 8720/2 Balances are very easy to use and are supplied with a protective working cover and an adjusting test weight to allow the user to quickly adjust the calibration.

Technical Specification   C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK8720M001	K0008720M001	K0US8720M001	Elcometer 8720/1 Standard Balance	○
K0UK8720M002	K0008720M002	K0US8720M002	Elcometer 8720/2 Standard Balance	○
Range	Elcometer 8720/1: 0 - 1210g (0 - 42.7oz)		Elcometer 8720/2: 0 - 10100g (0 - 356.3oz)	
Reproducibility	Elcometer 8720/1: 0.01g (0.0004oz)		Elcometer 8720/2: 0.1g (0.0004oz)	
Linearity	Elcometer 8720/1: ±0.03g (0.001oz)		Elcometer 8720/2: ±0.3g (0.001oz)	
Dimensions	165 x 230 x 80mm (6 x 9 x 3.1")			
Weight	1kg (2.2lb)			
Packing List	Elcometer 8720 KB Balance, 1 x 200g test weight, power cable and operating instructions			

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0UK8720M001 is the certificate for model K0UK8720M001).

Viscosity Cups

Viscosity is perceived as 'thickness' or resistance to pouring, but there is more to viscosity than this. All fluids have an internal friction between molecules, which determines how well fluid flows. Due to this internal friction, energy is required to move the liquid and viscosity is the measure of the resistance to flow.

Measuring Viscosity

Elcometer manufactures and supplies a wide range of viscosity gauges from flow cups to dip cups to rotational viscometers.

Flow Cups: The process of flow through an orifice can often be used as a relative measurement and classification of viscosity.

This measured kinematic viscosity is generally expressed in seconds of flow time which can be converted into Centistokes using a viscosity disc calculator.

Dip Cups: Using the same principle as flow cups, dip cups (Frikmar, Zahn, Shell etc.) can be used to provide a quick viscosity measurement either on-site or on the shop-floor.

Flow Measurement: Simple to use instruments that measure the fluidity and flow of coatings, especially thick or paste-like materials.

Definitions:

Viscosity: A measure of the resistance of a liquid to flow.

Kinematic Viscosity: The absolute viscosity of a fluid divided by the density of the fluid. Also known as the coefficient of kinematic viscosity.

Centipoise: A unit of measurement of which water is the standard at 1cP.

Newtonian fluids: are fluids that continue to flow at a given temperature, such as water and some oils - regardless of the forces acting on it. No matter how fast it is stirred or mixed, Newtonian fluids will always behave in the same manner.

Newtonian fluids are typically measured with flow and dip viscosity cups, see pages 8 - 14.

Non-Newtonian fluids: are fluids which change viscosity when a force is applied, e.g. paints and ketchup, etc. Non-Newtonian fluids are categorised as follows:

Thixotropic - gel-like substances at rest but liquid when agitated, eg: non-drip paints, ketchup and varieties of honey.

Rheopectic - where viscosity increases with duration of stress, eg: lubricants.

Pseudoplastics or shear thinning - where viscosity decreases with increased shear rate, eg: gelatin and clay.

Dilatant or shear thickening - where viscosity increases with increased shear rate, eg: corn starch or concentrated sugar solution.

Non-Newtonian fluids are usually measured using Rotational Viscometers, see pages 18 - 24.

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Elcometer 2353 & 2354   Viscosity Flow Cups

Viscosity Flow Cups are very easy to use instruments made of anodized aluminium with a stainless steel orifice, for measuring the consistency of paints, varnishes and similar products. The measured kinematic viscosity is generally expressed in seconds(s) flow time. If the Standards stipulate conversion methods the flow time can be converted into Centistokes (cSt) using the Elcometer ViscCalc™ Mobile Apps.

Calibration certificates which offer traceability and assurance that each viscosity cup has been individually tested and comply to Standards are also available.

The cups can be supplied separately or with an adjustable stand which includes a precision level and an overflow glass draw plate. It can also be supplied with a flow jacket for temperature control (thermojacket), see page 10 for more information.

STANDARDS:
ISO: ASTM D 5125, ISO 2431
BS: AS/NZS 1580.214.2 (cup 4)
BS 3900-A6:1971
FORD/ASTM: ASTM D 1200
DIN: DIN 53211 (cup 4)
AFNOR: NF T30-014

Available on the **App Store**

compatible with
ViscCalc™ for
Android™

Technical Specification   C

ISO Viscosity Flow Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002353M001	Elcometer 2353/1 ISO Viscosity Cup 3	3mm	7 - 42	◇
K0002353M002	Elcometer 2353/2 ISO Viscosity Cup 4	4mm	34 - 135	◇
K0002353M003	Elcometer 2353/3 ISO Viscosity Cup 5	5mm	91 - 326	◇
K0002353M004	Elcometer 2353/4 ISO Viscosity Cup 6	6mm	188 - 684	◇
K0002353M005	Elcometer 2353/5 ISO Viscosity Cup 8	8mm	-	◇
K0002353M001C	Elcometer 2353/1 with calibration certificate	3mm	7 - 42	● (e)
K0002353M002C	Elcometer 2353/2 with calibration certificate	4mm	34 - 135	● (e)
K0002353M003C	Elcometer 2353/3 with calibration certificate	5mm	91 - 326	● (e)
K0002353M004C	Elcometer 2353/4 with calibration certificate	6mm	188 - 684	● (e)
K0002353M005C	Elcometer 2353/5 with calibration certificate	8mm	-	● (d)

BS Viscosity Flow Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002354M001	Elcometer 2354/1 BS Viscosity Cup 2	2.38mm	6 - 43	◇
K0002354M002	Elcometer 2354/2 BS Viscosity Cup 3	3.17mm	28 - 150	◇
K0002354M003	Elcometer 2354/3 BS Viscosity Cup 4	3.97mm	89 - 340	◇
K0002354M004	Elcometer 2354/4 BS Viscosity Cup 5	4.76mm	79 - 441	◇
K0002354M005	Elcometer 2354/5 BS Viscosity Cup 6	7.14mm	369 - 1302	◇
K0002354M001C	Elcometer 2354/1 with calibration certificate	2.38mm	6 - 43	● (d)
K0002354M002C	Elcometer 2354/2 with calibration certificate	3.17mm	28 - 150	● (d)
K0002354M003C	Elcometer 2354/3 with calibration certificate	3.97mm	89 - 340	● (d)
K0002354M004C	Elcometer 2354/4 with calibration certificate	4.76mm	79 - 441	● (d)
K0002354M005C	Elcometer 2354/5 with calibration certificate	7.14mm	369 - 1302	● (d)

(1) For Information Only   (d) Dimensional Certificate   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.

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Viscosity Flow Cups

Technical Specification C

FORD/ASTM Viscosity Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002351M001	Elcometer 2351/1 FORD/ASTM Viscosity Cup 1	1.90mm	10 - 35	◇
K0002351M002	Elcometer 2351/2 FORD/ASTM Viscosity Cup 2	2.53mm	25 - 120	◇
K0002351M003	Elcometer 2351/3 FORD/ASTM Viscosity Cup 3	3.40mm	49 - 220	◇
K0002351M004	Elcometer 2351/4 FORD/ASTM Viscosity Cup 4	4.12mm	70 - 370	◇
K0002351M005	Elcometer 2351/5 FORD/ASTM Viscosity Cup 5	5.20mm	200 - 1200	◇
K0002351M001C	Elcometer 2351/1 with calibration certificate	1.90mm	10 - 35	● (e)
K0002351M002C	Elcometer 2351/2 with calibration certificate	2.53mm	25 - 120	● (e)
K0002351M003C	Elcometer 2351/3 with calibration certificate	3.40mm	49 - 220	● (e)
K0002351M004C	Elcometer 2351/4 with calibration certificate	4.12mm	70 - 370	● (e)
K0002351M005C	Elcometer 2351/5 with calibration certificate	5.20mm	200 - 1200	● (e)

DIN Viscosity Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002350M001	Elcometer 2350/1 DIN Viscosity Cup 2	2mm	-	◇
K0002350M002	Elcometer 2350/2 DIN Viscosity Cup 4	4mm	96 - 683	◇
K0002350M003	Elcometer 2350/3 DIN Viscosity Cup 6	6mm	-	◇
K0002350M004	Elcometer 2350/4 DIN Viscosity Cup 8	8mm	-	◇
K0002350M001C	Elcometer 2350/1 with calibration certificate	2mm	-	● (d)
K0002350M002C	Elcometer 2350/2 with calibration certificate	4mm	96 - 683	● (e)
K0002350M003C	Elcometer 2350/3 with calibration certificate	6mm	-	● (d)
K0002350M004C	Elcometer 2350/4 with calibration certificate	8mm	-	● (d)

AFNOR Viscosity Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002352M001	Elcometer 2352/1 AFNOR Viscosity Cup 2.5	2.46mm	5 - 140	◇
K0002352M002	Elcometer 2352/2 AFNOR Viscosity Cup 4	4mm	50 - 1100	◇
K0002352M003	Elcometer 2352/3 AFNOR Viscosity Cup 6	6mm	510 - 5100	◇
K0002352M001C	Elcometer 2352/1 with calibration certificate	2.46mm	5 - 140	● (d)
K0002352M002C	Elcometer 2352/2 with calibration certificate	4mm	50 - 1100	● (d)
K0002352M003C	Elcometer 2352/3 with calibration certificate	6mm	510 - 5100	● (d)

Viscosity Flow Cups - Cup Designs

ISO   BS   FORD/ASTM   DIN   AFNOR

(1) For Information Only   (d) Dimensional Certificate   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.
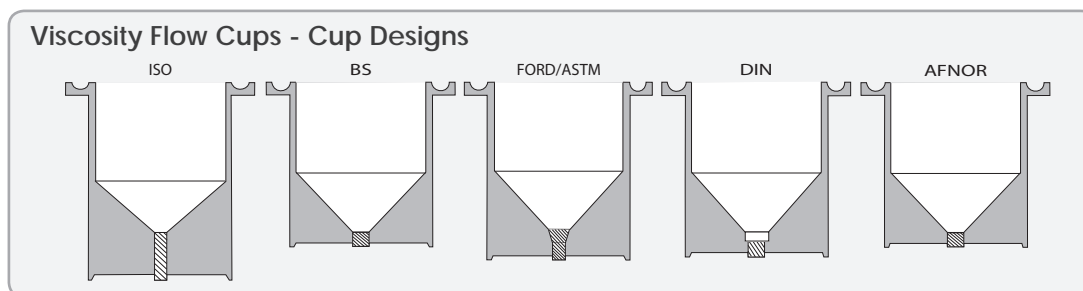
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Elcometer 2350/1/2/3/4   Viscosity Flow Cups

Accessories

	KT002400N001	**Viscosity Cup Precision Stand with Bubble Level and Glass Draw Plate** To ensure the viscosity cup is positioned correctly to carry out the test.
	KT002400N201	**Viscosity Cup Stand with Bubble Level and Glass Draw Plate** To ensure the viscosity cup is positioned correctly to carry out the test.
	KT002400P001	**Bubble Level for Viscosity Cup** To ensure the viscosity cup is parallel to the surface.
	KT002400P999	**Viscosity Glass Draw Plate** To retain test sample until operator is ready to commence test and provides surface for bubble level.
	KT002400N002	**Double-walled Stand with Thermojacket** For heating test samples for viscosity measurement at specific elevated temperatures.
	K0007300M201	**Elcometer 7300 High Precision Stopwatch** Measuring intervals: 1/100 second for 30 minutes and 1 second for 24 hours. Time/Calendar display, 12/24 hour mode
	KT002400N003	**Elcometer 2400 Conversion Disc** Allowing viscosity (cSt) and flow times of different cups to be calculated. Front: No.4 cups according to AFNOR, BS, NF, ASTM, DIN, Zahn 2 Back: No.3-4-5-6 cups according to ISO and Zahn 3
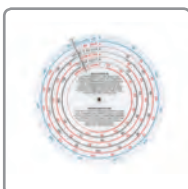
For a full range of Calibration Oils see page 15.

Thermometers

To accurately measure flow for viscosity the temperature needs to be 23°C ± 2°C (73.4°F). Here are a range of thermometers from Elcometer. For more information see pages 158 - 159.

T1164441-	Spirit Thermometer in °C
T1164442-	Spirit Thermometer in °F
G212----1A	Elcometer 212 Digital Pocket Thermometer (°C/°F) with Liquid Probe
	For more information see page 158
G213----2	Elcometer 213/2 Digital Thermometer (°C/°F)
T9996390-	Elcometer 213/2 Liquid Probe
	For more information see page 159

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Viscosity Dip Cups - Frikmar

Elcometer 2437 & 2435

Thanks to its handle, this cup is very easy to use to perform checks on site or during the manufacturing process. It is ideal for measuring the consistency of paints, varnishes and similar products.

Simply dip the cup into the product to be measured, lift it out and measure how long it takes for the contents to empty through the orifice.

The measured kinematic viscosity is generally expressed in seconds (s) flow time, which can be converted to Centistokes (cSt) if the Standard stipulates a conversion method.

Several ranges are available, according to the Standards being used; from 7 to 1100cSt.

Available on the App Store

compatible with
ViscCalc™ for
Android™
see page 274
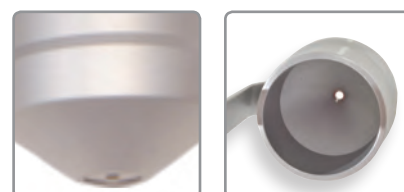
STANDARDS:
DIN: DIN 53211 (cup 4 only)
FORD/ASTM: ASTM D 1200
ISO: ASTM D 5125, ISO 2431
AFNOR: NF T30-014

Technical Specification   C

ISO Viscosity Dip Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002437M002	Elcometer 2437/2 ISO Dip Cup 3	3mm	7 - 42	◇
K0002437M003	Elcometer 2437/3 ISO Dip Cup 4	4mm	34 - 135	◇
K0002437M006	Elcometer 2437/6 ISO Dip Cup 5	5mm	91 - 326	◇
K0002437M004	Elcometer 2434/4 ISO Dip Cup 6	6mm	188 - 684	◇
K0002437M005	Elcometer 2437/5 ISO Dip Cup 8	8mm	-	◇
K0002437M002C	Elcometer 2437/2 with calibration certificate	3mm	7 - 42	● (e)
K0002437M003C	Elcometer 2437/3 with calibration certificate	4mm	34 - 135	● (e)
K0002437M006C	Elcometer 2437/6 with calibration certificate	5mm	91 - 326	● (e)
K0002437M004C	Elcometer 2437/4 with calibration certificate	6mm	188 - 684	● (e)
K0002437M005C	Elcometer 2437/5 with calibration certificate	8mm	-	● (d)

FORD/ASTM Viscosity Dip Cups

Part Number	Description	Orifice Diameter	Range (cSt)[1]	Certificate
K0002435M001	Elcometer 2435/1 FORD/ASTM Dip Cup 4	4.12mm	70 - 370	◇
K0002435M001C	Elcometer 2435/1 with calibration certificate	4.12mm	70 - 370	● (e)

For a full range of Calibration Oils see page 15.

(1) For Information Only   (d) Dimensional Certificate   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.

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Elcometer 2434 & 2436   Viscosity Dip Cups - Frikmar

Technical Specification   C

DIN Viscosity Dip Cups		Orifice Diameter	Range[1] (cSt)	Certificate
Part Number	Description			
K0002434M001	Elcometer 2434/1 DIN Dip Cup 2	2mm	-	◇
K0002434M002	Elcometer 2434/2 DIN Dip Cup 4	4mm	96 - 683	◇
K0002434M003	Elcometer 2434/3 DIN Dip Cup 6	6mm	-	◇
K0002434M004	Elcometer 2434/4 DIN Dip Cup 8	8mm	-	◇
K0002434M001C	Elcometer 2434/1 with calibration certificate	2mm	-	● (d)
K0002434M002C	Elcometer 2434/2 with calibration certificate	4mm	96 - 683	● (e)
K0002434M003C	Elcometer 2434/3 with calibration certificate	6mm	-	● (d)
K0002434M004C	Elcometer 2434/4 with calibration certificate	8mm	-	● (e)

AFNOR Viscosity Dip Cups		Orifice Diameter	Range[1] (cSt)	Certificate
Part Number	Description			
K0002436M001	Elcometer 2436/1 AFNOR Dip Cup 4	3.99mm	50 - 1100	◇
K0002436M001C	Elcometer 2436/1 with calibration certificate	3.99mm	50 - 1100	● (d)

Elcometer 2215   Lory Viscosity Cup

The Elcometer 2215 Lory Viscosity Cup is a conventional cylindrical cup with a needle fixed into the bottom for quick measurements on-site or during production.

The cup is first dipped into the product to be measured, which then empties through the escape hole. Unlike other Viscosity cups, the flow time is measured as soon as the point of the needle appears.

Technical Specification

Part Number	Description	Cup Number	Range (cSt)[1]
K0002215M001	Elcometer 2215 Lory Viscosity Cup	1	50 - 1100

(1) For Information Only   (d) Dimensional Certificate   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.

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Zahn Viscosity Dip Cups

Elcometer 2210

The Elcometer 2210 Zahn Dip Cup is a small U-shaped cup suspended from a looped wire. This method is ideal for measuring the consistency of paints, varnishes and similar products.

Simply dip the cup into the product to be measured, lift it out and measure how long it takes for the contents to empty through the orifice.

There are five cups with five different orifice sizes available, ranging from 5 to 1840cSt.

Available on the **App Store**

compatible with
ViscCalc™ for **Android**™
see page 274

STANDARDS:
ASTM D 1084-D, ASTM D 4212

Technical Specification				C
Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002210M001	Elcometer 2210/1 Zahn Dip Cup 1	1.8mm	5 - 56	◇
K0002210M002	Elcometer 2210/2 Zahn Dip Cup 2	2.7mm	21 - 231	◇
K0002210M003	Elcometer 2210/3 Zahn Dip Cup 3	3.8mm	146 - 848	◇
K0002210M004	Elcometer 2210/4 Zahn Dip Cup 4	4.3mm	222 - 1110	◇
K0002210M005	Elcometer 2210/5 Zahn Dip Cup 5	5.3mm	460 - 1840	◇
K0002210M001C	Elcometer 2210/1 with calibration certificate	1.8mm	5 - 56	● (e)
K0002210M002C	Elcometer 2210/2 with calibration certificate	2.7mm	21 - 231	● (e)
K0002210M003C	Elcometer 2210/3 with calibration certificate	3.8mm	146 - 848	● (e)
K0002210M004C	Elcometer 2210/4 with calibration certificate	4.3mm	222 - 1110	● (e)
K0002210M005C	Elcometer 2210/5 with calibration certificate	5.3mm	460 - 1840	● (e)

For a full range of Calibration Oils see page 15.

(1) For Information Only   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.

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Elcometer 2310

Shell Viscosity Dip Cups

The Elcometer 2310 Shell Viscosity Dip Cups are stainless steel cups for quick measurements on-site or during production. These cups are often used in the printing or ink industry.

Simply dip the cup into the product to be measured, lift it out and measure how long it takes for the contents to empty through the orifice.

The measured kinematic viscosity is generally expressed in seconds (s) flow time, which can be converted into Centistokes (cSt).

There are six different orifice sizes available, for measurements between 2 and 1300cSt.

STANDARDS:
ASTM D 4212

Available on the App Store

compatible with
ViscCalc™ for Android™
see page 274

Technical Specification   C

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002310M001	Elcometer 2310/1 Shell Dip Cup 1	1.8mm	2 - 20	◇
K0002310M002	Elcometer 2310/2 Shell Dip Cup 2	2.4mm	10 - 50	◇
K0002310M003	Elcometer 2310/3 Shell Dip Cup 3	3.1mm	30 - 120	◇
K0002310M004	Elcometer 2310/4 Shell Dip Cup 4	3.8mm	70 - 270	◇
K0002310M005	Elcometer 2310/5 Shell Dip Cup 5	4.6mm	125 - 520	◇
K0002310M006	Elcometer 2310/6 Shell Dip Cup 6	5.8mm	320 - 1300	◇
K0002310M001C	Elcometer 2310/1 with calibration certificate	1.8mm	2 - 20	● (e)
K0002310M002C	Elcometer 2310/2 with calibration certificate	2.4mm	10 - 50	● (e)
K0002310M003C	Elcometer 2310/3 with calibration certificate	3.1mm	30 - 120	● (e)
K0002310M004C	Elcometer 2310/4 with calibration certificate	3.8mm	70 - 270	● (e)
K0002310M005C	Elcometer 2310/5 with calibration certificate	4.6mm	125 - 520	● (e)
K0002310M006C	Elcometer 2310/6 with calibration certificate	5.8mm	320 - 1300	● (e)

For a full range of accessories see page 10

(1) For Information Only   (d) Dimensional Certificate   (e) Efflux Time Certificate

● Calibration Certificate supplied as standard.   ◇ Batch Calibration Certificate supplied as standard.

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Elcometer Viscosity Cup Standard Calibration Oils

Elcometer 2410

In order to check the viscosity cup's calibration or to certify it for ISO purposes, it is imperative that viscosity cup standard calibration oils are used.

Standard oils have a specific drain time, dependent upon the viscosity cup type (Ford, Shell, Zahn etc.) and the orifice or cup number used.

To check the viscosity cup, use the standard viscosity oils in place of the liquid and measure the drain time.

Specific calibration oils can only be used with specific flow and dip cups. Please use the table below to determine which calibration oil is required with each cup, or contact Elcometer. Viscosity oils are supplied in ½ litre (1 pint) bottles.

Technical Specification						C
Part Number	Cup Type	Cup No.	Suitable For	Kinematic Viscosity at 25°C (77°F) †	Orifice Diameter	Certificate
K0002410M021	Zahn Dip Cup	1	Elcometer 2210/1	34cSt	2mm	●
K0002410M022	Zahn Dip Cup	2	Elcometer 2210/2	120cSt	2.7mm	●
K0002410M023	Zahn Dip Cup	3	Elcometer 2210/3	230cSt	3.8mm	●
K0002410M024	Zahn Dip Cup	3	Elcometer 2210/3	460cSt	3.8mm	●
K0002410M025	Zahn Dip Cup	4	Elcometer 2210/4	850cSt	4.3mm	●
K0002410M026	Zahn Dip Cup	5	Elcometer 2210/5	1600cSt	5.3mm	●
K0002410M021	Shell Dip Cup	2	Elcometer 2310/2	34cSt	2.4mm	●
K0002410M022	Shell Dip Cup	4	Elcometer 2310/4	120cSt	3.8mm	●
K0002410M023	Shell Dip Cup	5	Elcometer 2310/5	230cSt	4.6mm	●
K0002410M024	Shell Dip Cup	6	Elcometer 2310/6	460cSt	5.8mm	●
K0002410M022	DIN Flow Cup	4	Elcometer 2350/2	120cSt	4mm	●
K0002410M023	DIN Flow Cup	4	Elcometer 2350/2	230cSt	4mm	●
K0002410M024	DIN Flow Cup	4	Elcometer 2350/2	460cSt	4mm	●
K0002410M021	ASTM/FORD Flow Cup	2	Elcometer 2531/2	34cSt	2.53mm	●
K0002410M022	ASTM/FORD Flow Cup	3	Elcometer 2531/3	120cSt	3.40mm	●
K0002410M023	ASTM/FORD Flow Cup	4	Elcometer 2351/4	230cSt	4.12mm	●
K0002410M021	ISO Flow Cup	3	Elcometer 2353/1	34cSt	3mm	●
K0002410M022	ISO Flow Cup	4	Elcometer 2353/2	120cSt	3.95mm	●
K0002410M023	ISO Flow Cup	6	Elcometer 2353/4	230cSt	6mm	●
K0002410M024	ISO Flow Cup	6	Elcometer 2353/4	460cSt	6mm	●
K0002410M022	DIN Frikmar Dip Cup	4	Elcometer 2434/2	120cSt	4mm	●
K0002410M023	DIN Frikmar Dip Cup	4	Elcometer 2434/2	230cSt	4mm	●
K0002410M024	DIN Frikmar Dip Cup	4	Elcometer 2434/2	460cSt	4mm	●
K0002410M021	ISO Frikmar Dip Cup	3	Elcometer 2437/2	34cSt	3mm	●
K0002410M022	ISO Frikmar Dip Cup	4	Elcometer 2437/3	120cSt	4mm	●
K0002410M023	ISO Frikmar Dip Cup	6	Elcometer 2437/4	230cSt	6mm	●
K0002410M024	ISO Frikmar Dip Cup	6	Elcometer 2437/4	460cSt	6mm	●

† Nominal Value

● Calibration certificate supplied as standard.

Viscosity Cup Conversion

The table below lists the major flow cup types together with a conversion chart of Efflux Time (in seconds) to Viscosity in Centistokes (cSt). It has been constructed from the various International Standard Calculators.

Each cup design is unique, care must be taken when comparing viscosity values between different cup types. These values are the absolute values and do not include the allowed tolerances, as these differ considerably between each of the Standards.

Available on the App Store

available on ViscCalc™ for Android™ see page 274

Viscosity Cup Type

Time (seconds)	DIN	BS					ISO				FORD / ASTM				ZAHN					SHELL					
	4	2	3	4	5	6	3	4	5	6	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
15	38	6.4		19	40	234			35	66			19	40		4	88	148	322			20	48	91	235
16	45	6.8	3	24	48	262			39	75			22	44		7	99	163	345			21	52	98	251
17	51	7.3	5	28	56	290			43	84			24	48		11	111	178	368			23	55	104	267
18	57	7.7	7	32	64	317			47	93			26	52		14	123	192	391	1.1	7.5	24	59	111	284
19	63	8.1	9	35	72	343			51	101	1		29	56		18	135	207	414	1.4	8.1	26	62	117	300
20	69	8.6	11	39	79	369			55	110	3		31	60		21	146	222	437	1.6	8.6	27	66	124	316
21	74	9.0	13	43	86	395			58	118	4		33	64		25	158	237	460	1.8	9.2	29	69	130	332
22	80	9.4	15	47	93	420			62	126	6		36	67		28	170	252	483	2.0	9.8	30	72	137	348
23	85	9.8	17	50	100	445	1		66	134	7		38	71		32	181	266	506	2.3	10.4	32	76	143	365
24	91	10.3	18	54	107	470	2		70	142	9		40	75		35	193	281	529	2.5	10.9	33	79	150	381
25	96	10.7	20	57	114	494	3		73	150	10		43	79		39	205	296	552	2.7	11.5	35	83	156	397
26	101	11.1	22	60	120	519	4		77	157	12		45	83		42	216	311	575	2.9	12.1	36	86	163	413
27	107	11.5	23	64	127	543	4.5		80	165	13		47	87		46	228	326	598	3.2	12.7	38	90	169	429
28	112	12.0	25	67	133	567	5		84	173	14		49	91		49	240	340	621	3.4	13.2	39	93	176	446
29	117	12.4	26	70	140	591	6		88	180	16		52	94		53	252	355	644	3.6	13.8	41	97	182	462
30	122	12.8	28	73	146	614	6.6	34.5	91	188	17		54	98	1	56	263	370	667	3.8	14.4	42	100	189	478
31	127	13.3	30	77	153	638	7.3	36.0	95	196	19		56	102	2	60	275	385	690	4.1	15.0	44	104	195	494
32	132	13.7	31	80	159	662	7.9	37.5	98	203	20		59	106	3	63	287	400	713	4.3	15.6	45	107	202	510
33	137	14.1	33	83	165	685	8.6	38.0	102	210	22		61	110	4	67	298	414	736	4.5	16.1	47	110	208	527
34	142	14.5	34	86	171	709	9.2	41.0	105	218	23		63	114	6	70	310	429	759	4.7	16.7	48	114	215	543
35	147	15.0	35	89	177	732	9.8	42.0	109	225		24	66	117	7	74	322	444	782	5.0	17.3	50	117	221	559
36	152	15.4	37	92	184	755	10.4	44.0	112	233		26	68	121	8	77	333	459	805	5.2	17.9	51	121	228	575
37	157	15.8	38	96	190	778	11.0	45.2	115	240		27	70	125	9	81	345	474	828	5.4	18.4	53	124	234	591
38	162	16.3	40	99	196	801	11.6	47.0	119	247	1	29	73	129	10	84	357	488	851	5.6	19.0	54	128	241	608
39	167	16.7	41	102	202	825	12.1	48.0	122	254	2	30	75	133	11	88	369	503	874	5.9	19.6	56	131	247	624
40	172	17.1	43	105	208	848	12.7	50.0	126	262	2	32	77	137	12	91	380	518	897	6.1	20.2	57	135	254	640
41	176	17.5	44	108	214	871	13.3	51.2	129	269	3	33	80	141	13	95	392	533	920	6.3	20.7	59	138	260	656
42	181	18.0	45	111	220	893	13.8	53.0	133	276	4	35	82	144	14	98	404	548	943	6.6	21.3	60	141	267	672
43	186	18.4	47	114	226	916	14.4	54.0	136	283	4	36	84	148	15	102	415	562	966	6.8	21.9	62	145	273	689
44	191	18.8	48	117	232	939	14.9	56.0	139	291	5	37	86	152	17	105	427	577	989	7.0	22.5	63	148	280	705
45	196	19.2	50	120	238	962	15.5	57.0	143	298	5	39	89	156	18	109	439	592	1012	7.2	23.0	65	152	286	721
46	200	19.7	51	123	244	985	16.0	59.0	146	305	6	40	91	160	19	112	450	607	1035	7.5	23.6	66	155	293	737
47	205	20.1	52	126	250	1008	16.6	60.0	149	312	6	42	93	164	20	116	462	622	1058	7.7	24.2	68	159	299	753
48	210	20.5	54	129	255	1030	17.1	62.0	153	319	7	43	96	168	21	119	474	636	1081	7.9	24.8	69	162	306	770
49	215	21.0	55	132	261	1053	17.6	63.5	156	326	7	45	98	171	22	123	486	651	1104	8.1	25.3	71	166	312	786
50	219	21.4	56	135	267	1076	18.2	64.5	160	334	8	46	100	175	23	126	497	666	1127	8.4	25.9	72	169	319	802
51	224	21.8	58	138	273	1099	18.7	66.0	163	341	8	48	103	179	24	130	509	681	1150	8.6	26.5	74	173	325	818
52	229	22.2	59	141	279	1121	19.2	67.5	166	348	8	49	105	183	25	133	521	696	1173	8.8	27.1	76	176	332	834
53	234	22.7	60	144	285	1144	19.7	69.0	170	355	9	50	107	187	26	137	532	710	1196	9.0	27.6	77	179	338	851
54	238	23.1	62	147	291	1166	20.2	70.0	173	362	9	52	110	191	28	140	544	725	1219	9.3	28.2	79	183	345	867
55	243	23.5	63	150	297	1189	20.7	71.5	176	369	10	53	112	194	29	144	556	740	1242	9.5	28.8	80	186	351	883
56	248	24.0	64	153	302	1212	21.2	73.0	180	376	10	55	114	198	30	147	567	755	1265	9.7	29.4	82	190	358	899
57	253	24.4	66	156	308	1234	21.7	75.0	183	383	11	56	116	202	31	151	579	770	1288	9.9	30.0	83	193	364	915
58	257	24.8	67	159	314	1257	22.2	76.0	186	390	11	58	119	206	32	154	591	784	1311	10.2	30.5	85	197	371	932
59	262	25.2	68	162	320	1279	22.7	77.0	190	397	12	59	121	210	33	158	603	799	1334	10.4	31.1	86	200	377	948
60	267	25.7	70	165	326	1302	23.2	79.0	193	405	12	60	123	214	34	161	614	814	1357	10.6	31.7	88	204	384	964
65	290	27.8	76	179	354	1414	26	86.0	210	440	15	68	135	233	40	179	673	888	1472	11.8	34.6	95	221	416	1045
70	313	29.9	83	194	383	1526	28	93.0	226	475	17	75	147	252	45	196	731	962	1587	12.9	37.4	103	238	449	1126
75	337	32.1	89	208	412	1638	31	100	243	510	20	82	158	271	51	214	790	1036	1702	14.0	40.3	110	255	481	1207
80	360	34.2	96	223	441	1750	33	108	260	545	22	89	170	291	56	231	848	1110	1817	15.1	43.2	118	273	514	1288
85	383	36.4	102	237	469	1861	35	115	276	580	25	96	181	310	61.6	249	907	1184	1932	16.3	46.1	125	290	546	1369
90	406	38.5	108	252	498	1973	38	122	293	615	27	104	193	329	67	266	965	1258	2047	17.4	49.0	133	307	579	1450
100	452	42.8	121	280	554	2195	42	135	326	684	32	118	216	368	78	301	1082	1406	2277	19.7	54.7	148	342	644	1612
110	499	47.0	134	309	611	2418	47		359	754	37	132	239	406	89	336	1199	1554	2507	21.9	60.5	163	376	709	1774
120	545	51.3	146	338	668	2640	51		392	823	42	147	262	445	100	371	1316	1702	2737	24.2	66.2	178	411	774	1936
130	591	55.6	159	366	724	2862	56		425	893	47	161	285	483	111	406	1433	1850	2967	26.4	72.0	193	445	839	2098
140	637	59.9	171	395	781	3084	61		458	962	51	176	308	522	122	441	1550	1998	3197	28.7	77.8	208	480	904	2260
150	682	64.2	184	424	837	3305	65		491	1031	56	190	331	560	133	476	1667	2146	3427	31.0	83.5	223	514	969	2422

All measurements are in Centistokes (cSt). Centipoise (cP) = cSt x product density

Rotational Viscosity

Rotational viscometers are used to determine the viscosity of non-Newtonian fluids which do not depend solely on temperature and pressure.

Rotational Viscometers

Rotational viscometers consist of two parts - the head unit with a motor and a spindle that is driven by the motor. The viscosity is determined by measuring the resistance of the spindle as it rotates in the sample.

Rotational viscometers gather data on a material's viscosity behaviour under different conditions and are used to measure the viscosity of non-Newtonian fluids which change viscosity when a force is applied.

Rotational viscometers are therefore ideal for determining the viscosity of liquids which do not depend solely on temperature and pressure.

The viscosity of non-Newtonian fluids is dependent upon temperature, shear rate and time. There are several different categories of non-Newtonian fluids and depending on how viscosity changes with time, the flow behaviour is characterised as:

Thixotropic - time thinning, i.e. viscosity decreases with time. *Thixotropics* - are gel-like substances at rest but liquid when agitated, eg: non-drip paints, ketchup and varieties of honey.

Rheopectic - time thickening, i.e. where viscosity increases with duration of stress, eg: some lubricants. Rheopectic liquids are very rare. Some liquids show time thinning behaviour due to breakdown of the structure. This phenomenon is sometimes known as Rheomaiaxis.

Depending on how viscosity changes with shear rate, the flow behaviour is characterised as:

Pseudoplastics or shear thinning - where viscosity decreases with increased shear rate, eg: blood, gelatin and clay.

Dilatant or shear thickening - the viscosity increases with increased shear rate, eg: corn starch or concentrated sugar solution.

Plastic - exhibits a so-called yield value, i.e. a certain shear stress must be applied before a flow occurs.

Newtonian fluids, (such as water, paints, etc.), which continue to flow at a given temperature regardless of the forces acting on it are typically measured using viscosity flow and dip cups, see pages 8 to 14.

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Elcometer 2250 Krebs Viscometer

Featuring a unique automatic test mode, the Elcometer 2250 Krebs Viscometer measures the viscosity of paints, varnishes, adhesives, pastes and liquid inks at the touch of a button.

Designed for use in accordance with National and International Standards - the Elcometer 2250 is ideal for both process control and quality assurance.

Fully automated Krebs test
- simply set up and press 'Start'

Choice of measurement:
Krebs Units (KU), Grams (g), or Centipoise (cP)

Designed for use with either a 600ml beaker, 1 pint or ½ pint cans

Standard Krebs spindle with fixed spindle speed of 200rpm

Can be used with non-standard containers and sample volumes

User adjustable "Sample Waiting Time" and "Measuring Time"

Date and time stamp for each reading

Optional thermal printer for a permanent record of results

Krebs Viscometer

The Elcometer 2250 offers users both an automatic or manual Krebs viscosity test. The unit has a fixed spindle speed of 200rpm and displays the viscosity value on screen in Krebs Units (KU), Grams (g) or Centipoise (cP).

The Elcometer 2250 has two operating modes; 'Automatic' and 'Manual'.

- *Automatic Mode:*

  Automatic test - ensuring reliability and consistency of results - ideal for repeatable and reproducible testing.

  Once the sample beaker is positioned on the support, and the 'Start' button is pressed, the drive head automatically moves down until the spindle reaches the correct position within the sample.

  After a pause to let the sample settle, the Elcometer 2250 begins the test and displays the viscosity value. Once the test has been completed, the head automatically returns to the start position allowing the sample to be removed.

- *Manual Mode:*

  The Elcometer 2250 can also be used manually - ideal for measuring non-standard sample sizes.

STANDARDS:

AS/NZS 1580.214.1, ASTM D 562, ASTM D 856, ASTM D 1084-C, ASTM D 1131

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Elcometer 2250   Krebs Viscometer

Technical Specification   C

Part Number	Description		Certificate
K2250M001	Elcometer 2250 Krebs Viscometer		●
Measurement Units	Krebs Units (KU)	Grams (g)	Centipoise (cP)
Range	40 KU to 141 KU	32g to 1099g	27 cP to 5274 cP
Resolution	0.1 KU	1g	5 cP
Measurement Accuracy	±1% of full scale		
Repeatability	±0.5%		
Speed (Accuracy)	200rpm (±1rpm)		
Operating Temperature	10°C to 40°C (50°F to 104°F)		
Maximum Altitude	2000m (6500ft) above sea level		
Dimensions	500 x 325 x 190mm (19.7 x 12.8 x 7.5")		
Weight	8.5kg (18.7lb)		
Packing List	Elcometer 2250 Krebs Viscometer, krebs spindle, large sample container support for 600ml glass beaker or 1 pint (USA) can, small sample container support for ½ pint (USA) can, sample container support locating plug, glass beaker 600ml (20.3fl.oz.), hexagonal wrench, 3 x mains lead (UK, EUR and US), calibration certificate and operating instructions.		

Accessories

Part Number	Description
KT00225021791	Special Krebs Spindle
KT00225022906	Special Paste Spindle
KT00225021794	Sample Container Support for 600ml (20.3 fl.oz.) Glass Beaker or 1 pint (USA) Can
KT00225021795	Sample Container Support for ½ pint (USA) Can
KT00225021793	Sample Container Support Locating Plug
KT00225021796	Glass Beaker: 600ml (20.3 fl.oz.)
KTUK999920179	Thermal Printer, UK 240V
KT00999920178	Thermal Printer, EUR 220V
KTUS999920180	Thermal Printer, US 110V

Krebs Viscosity Standard Calibration Oils   C

Part Number	Description	Krebs Units (KU)	Centipoise (cP)	Certificate
KT002250N001	Krebs Calibration Oil: S200	64	400	●
KT002250N002	Krebs Calibration Oil: N350	79	750	●
KT002250N003	Krebs Calibration Oil: N400	84	940	●
KT002250N004	Krebs Calibration Oil: S600	95	1400	●
KT002250N005	Krebs Calibration Oil: N1000	115	2600	●
Packing List	Supplied in 500ml (1 pint) bottles complete with calibration certificate and accurate to ±1% of the stated viscosity values			

● Calibration Certificate supplied as standard.

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Digital Rotational Viscometers

Elcometer 2300

Available in four versions with a choice of low to medium or medium to high viscosity ranges, either manually or PC controlled, the Elcometer 2300 range of rotational viscometers can be used to measure the viscosity of liquids in accordance with ISO 2555 and a number of ASTM standards.

STANDARDS:
AS/NZS 1580.214.5, ASTM D 1084-B, ASTM D 2196, BS 3900-A7-2, ISO 2555, ISO 2884-2

Low to medium or medium to high viscosity versions - manually or PC controlled via ViscosityMaster™

Clear, backlit LCD displays:

- Viscosity reading (cP or mPas)
- Spindle rotation speed
- % torque
- Sample temperature
- Auto range
- Shear rate & shear stress

Wide range of spindles for various viscosity and shear rate measurements

Automated Krebs test - set up and press 'Start'

Audible warning if viscosity reading exceeds the limits set by the user

Temperature probe supplied for increased accuracy of measurement

supplied with
ViscosityMaster™
data management software
see page 25

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Elcometer 2300   Digital Rotational Viscometers

Technical Specification   C

Model Elcometer 2300	RV1-L	RV2-L	RV1-R	RV2-R
Part Number	K2300M101	K2300M201	K2300M102	K2300M202
Measuring Range (mPas)	3 - 2,000,000	3 - 2,000,000	20 - 13,000,000	20 - 13,000,000
Spindles Supplied	L1 to L4	L1 to L4	R2 to R7	R2 to R7
Backlit LCD	■	■	■	■
Readings in cP and mPas	■	■	■	■
Low to Medium Viscosity	■	■		
Medium to High Viscosity			■	■
Sample Temperature Measurement	■	■	■	■
Manually Controlled	■	■	■	■
PC Controlled		■		■
Certificate	●	●	●	●
Measurement Accuracy	±1% of full scale			
Repeatability	±0.2%			
Maximum Altitude above Sea Level	2000m (6562ft)			
Speeds (rpm)	0.3, 0.5, 0.6, 1, 1.5, 2, 2.5, 3, 4, 5, 6, 10, 12, 20, 30, 50, 60, 100, 200			
Accuracy (Speed)	<0.5% of the absolute value			
Sample Temperature Measurement Range[†]	-15°C to +180°C (5°F to 356°F)			
Sample Temperature Measurement Resolution[†]	0.1°C (0.18°F)			
Sample Temperature Measurement Accuracy[†]	±0.1°C (±0.18°F)			
Ingress Protection	Level 2			
Dimensions (of carry case)	495 x 420 x 200mm (19.5 x 16.5 x 8")			
Weight (including carry case)	9kg (20lb)			
Packing List	Elcometer 2300 Digital Rotational Viscometer, spindle set, 3 x mains lead (UK, EUR and US), hexagonal wrench, RS232 connection cable, ViscosityMaster™ Software[‡], calibration certificate and operating instructions			

†   Temperature measurement using PT100 Thermometer

‡   RV1 Models: For data transfer from Viscometer to PC only; RV2 Models: For bi-lateral data transfer between Viscometer and PC

● Calibration Certificate supplied as standard.

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Digital Rotational Viscometers

Accessories

Spindles

Each Elcometer 2300 is supplied with a set of stainless steel spindles as standard, suitable for both Newtonian & non-Newtonian fluids.
Elcometer 2300 RV-L is supplied with spindles L1-L4 for low to medium viscosity testing.
Elcometer 2300 RV-R is supplied with spindles R2-R7 for medium to high viscosity testing.
A large R1 spindle (highlighted) can be supplied upon request.

Part Number	Description
KT00230019698	Spindle Set: Type L1 to L4 for Low to Medium Viscosity Testing
KT00230019699	Spindle Set: Type R2 to R7 for Medium to High Viscosity Testing
KT00230019700	R1 Spindle

Small Sample Adaptor

The small sample adaptor consists of a cylindrical sample chamber which can be used in conjunction with spindles TL & TR to accurately obtain viscosity measurements, shear rate and shear stress of sample volumes between 8 - 13ml (0.27 - 0.44fl.oz).

The TL spindles are for low to medium viscosity samples and TR spindles are for use with medium to high viscosity samples.

Part Number	Description
KT00230019702	Adaptor Kit for Small Volume Samples‡
KT00230019784	Adaptor Kit for Small Volume Samples & Integrated Temperature Sensor‡
KT00230019703	Small Volume Spindle Set: Type TL5 to TL7 for Low to Medium Viscosity Testing
KT00230019704	Small Volume Spindle Set: Type TR8 to TR11 for Medium to High Viscosity Testing

‡ Small volume spindle set required

Low Viscosity Adaptor

The low viscosity adaptor consists of a cylindrical sample chamber and is supplied complete with spindle. Used to accurately obtain viscosity measurements, shear rate and shear stress of low viscosity materials from 1cP (mPa), the stainless steel chamber can hold a sample volume from 16 - 18ml (0.54 - 0.61fl.oz) and keep it at a constant specified temperature of between 0°C and 100°C (32°F and 212°F).

Part Number	Description
KT00230019710	Low Viscosity Adaptor Kit with Spindle

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Elcometer 2300   Digital Rotational Viscometers

Accessories

High Temperature Adaptor
Ideal for use with materials such as hot resins, bitumens and oils, the high temperature adaptor allows precise measurement of viscosity at high temperatures. It can accurately obtain viscosity measurements, shear rate and shear stress from 1cP (mPa) up to temperatures of 200°C (392°F).

The stainless steel chamber can hold a sample volume from 16 - 18ml (0.54 - 0.61fl. oz). Each adaptor is supplied complete with a spindle.

Part Number	Description
KT00230019711	High Temperature Adaptor Kit with Spindle

Helical Movement Adaptor
Some materials, such as creams, pastes and gels, do not flow easily, so standard spindles and testing methods cannot be used as they create a 'hole' in the material, generating invalid results. The helical movement adaptor moves smoothly up and down, automatically staying within pre-programmed limits, allowing the needle style spindle to cut into the material without making a 'hole' and making the measurement of viscosity possible.

The kit is supplied with the motor and 6 T-shaped spindles: PA, PB, PC, PD, PE, PF.

Part Number	Description
KT00230019705	Helical Movement Adaptor Kit with Spindle Set, UK 240V
KT00230019706	Helical Movement Adaptor Kit with Spindle Set, EUR 220V
KT00230019707	Helical Movement Adaptor Kit with Spindle Set, US 110V

Standard Calibration Oils
Silicone standard oils are used to check viscosity measurements. The values are given for 6 different temperatures between 20°C and 27°C (68°F and 80°F).

These oils are specifically manufactured for use with Elcometer 2300 Rotational Viscometers and values quoted are nominal at 25°C (77°F).

Part Number				
60ml (2fl.oz)	500ml (1 pint)	Description	Centipoise (cP)	Certificate
KT009999N001	KT009999N101	RV Standard Calibration Oil	300	●
KT009999N002	KT009999N102	RV Standard Calibration Oil	700	●
KT009999N003	KT009999N103	RV Standard Calibration Oil	1000	●
KT009999N004	KT009999N104	RV Standard Calibration Oil	25000	●
KT009999N005	KT009999N105	RV Standard Calibration Oil	40000	●

Elcometer ViscosityMaster™ Software

ViscosityMaster™ is the powerful, yet easy to use software supplied with all Elcometer 2300 Rotational Viscometers. Specifically designed to maximise the versatility and usability of the viscometer, data can be stored along with associated photographs, test notes and all related test information.

ViscosityMaster™ makes it easy to collate and use the data recorded. Whether the data is required for analysis or to create professional reports for distribution to customers or colleagues, ViscosityMaster™ can deliver. With inbuilt report templates and easy access to all data, images and other associated files, ViscosityMaster™ makes managing data quick and easy.

ViscosityMaster™ software has been designed to be familiar and intuitive to any PC user. It is simple to batch all associated files and folders, create new batches or reports, programme and control the Elcometer 2300 using the wizards.

An example batch is pre-loaded into the software helping the user to discover all the features available.

The Process Wizard will ask the user to define process variables such as Identifier, Start RPM, End RPM, Time etc. On input of the information required, select 'Finish' and the new process will appear in the 'Processes' tab window.

Custom reports are produced using the Report Wizard. Aside from the measurements and charts, the user can include photographs, images, Word documents etc. When complete, this can be saved and exported as a PDF or a JPEG image and e-mailed as an attachment to where ever it is required.
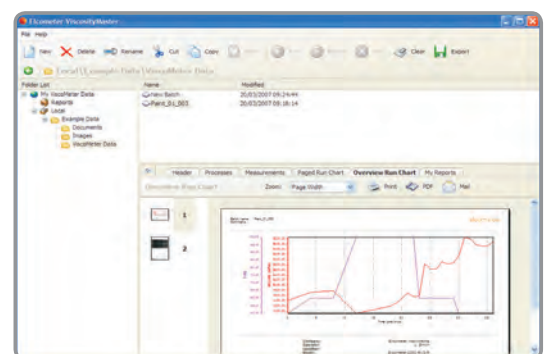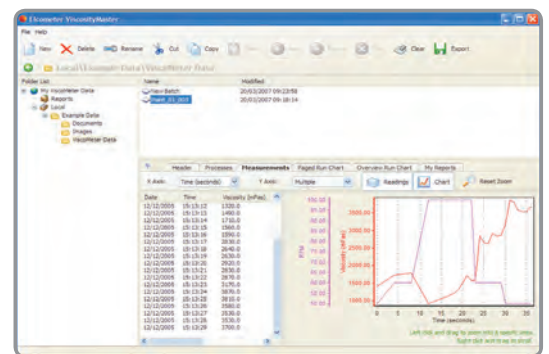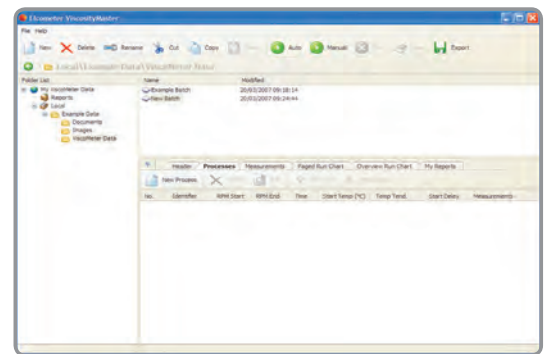
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Elcometer 2280 — Matthis Fluidometer

The Elcometer 2280 is a simple and easy-to-use instrument to measure the fluidity of a coating.

The coating to be measured is poured into the semi-spherical cavity of the instrument, which is in the horizontal position. The instrument is then lifted vertically allowing the liquid in the groove to flow under gravity, this is graduated in mm.

The distance flowed after approximately 10 seconds ± 0.5 seconds, measured with the sand timer provided, indicates the fluidity of the coating.

Technical Specification

Part Number	Description
K0002280M001	Elcometer 2280 Matthis Fluidometer

Elcometer 2290 — Daniel Flow Gauge

This simple instrument is used to assess the ability of thick or paste-like materials such as paints or printing inks to flow.

The product is poured into the semi-cylindrical reservoir. When the instrument is lifted vertically, the product runs on a graduated plate, which is fixed perpendicular to the reservoir.

The distance covered in a pre-determined time is the measure of the fluidity.

Technical Specification

Part Number	Description
K0002290M001	Elcometer 2290 Daniel Flow Gauge
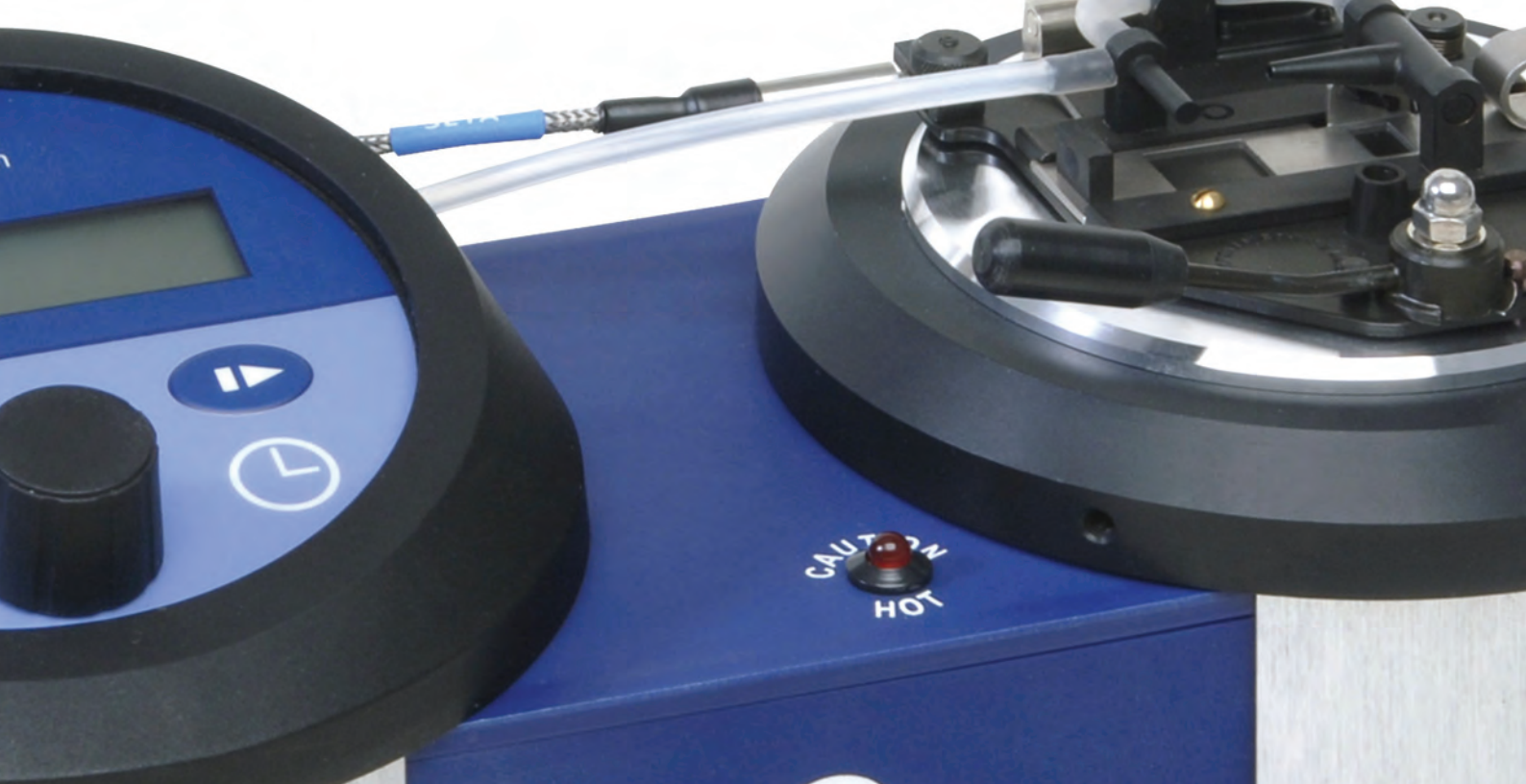
Flash Point

When developing any solvent based liquid including paint, coating or ink it is imperative that the flash point is determined and declared in order to meet the stringent transport regulations laid down by governments around the world.

Flash Point is defined as "the lowest temperature of a liquid at which its vapours will form a combustible mixture with air". It is a convenient and reliable classification of the "flammability" of many substances.

Measuring Flash Point
Most industries need to test the Flash Point of raw materials, products or waste to ensure:

Product quality - as a measure of consistency and performance comparison

Compliance testing - to test safety classification for handling, storage, transport and waste

In-service analysis - tests on in-use oils and other substances for contamination/adulteration

General safety - to evaluate hazard potential

Specifications - to check conformance

Elcometer offer a range of Flash Point testing equipment, including:

Open Cup tests - simulate an un-contained condition, for example a spillage.

Closed Cup - *tests* simulate an enclosed environment, for example storage in a tank or sealed container.

Testing flammable & combustible substances for Flash Point - The "flammability" of a material determines its safety classification and the regulations under which it must be handled, stored and transported. As not all mixtures containing solvents are highly flammable, an accurate and rapid Flash Point check is vital in reporting a material's "flammability" classification and may assist to save costs and reduce giveaway.

Flash point tests using the "rapid equilibrium" method - Traditional Equilibrium Flash Point tests such as ISO1516 and ISO1523 use any cup in a water bath to ensure that the liquid and vapour of the sample are in temperature equilibrium by adopting a complex procedure and a very slow heating rate.

Elcometer Setaflash utilises a 2ml (0.067 fl oz) or 4ml (0.135 fl oz) sample which achieves rapid equilibrium and gives a reliable Flash Point result in just one or two minutes.

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Elcometer 6910/1   Setaflash 'Series 3' Closed Cup Tester

A wide range of features ensures ease of operation and requires minimum operator skill. Test parameters are set via the keypad and a digital display provides temperature, sample size, test time and flash detection status. Default 'Auto' values are available for standard test conditions.

The Elcometer 6910 Closed Cup Tester can test from ambient to 300°C (572°F). Temperature is factory calibrated but facilities for user verification and calibration are incorporated.

Flash Point is automatically detected using a thermally activated detector, reducing the risk of operator error and minimising the potential danger of inhaling fumes during a test. A rechargeable gas tank with On/Off switch and fine adjustment are integral to the unit.   Supplied with a 2ml (0.067fl oz) syringe and ignitor.

To test below the ambient temperature, an optional cooling module, suitable for temperatures as low as 0°C (32°F), should be ordered.

STANDARDS:

ASTM D 1655, ASTM D 3278, ASTM D 3828, ASTM D 3934, ASTM E 502, BS 3900-A13, BS 3900-A11, BS 3900-A14, BS 6664-3, BS 6664-4, EN 456, ISO 3679, ISO 3680

Technical Specification   C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK6910M010	K0006910M010	K0US6910M010	Elcometer 6910/1 Setaflash 'Series 3' Closed Cup Tester	○
Sample Size and Temperature Range	2ml (0.067fl oz) for Flash Points, from ambient up to 100°C (212°F)			
	4ml (0.135fl oz) for Flash Points between 100°C to 300°C (212°F to 572°F)			
Test Times	Between 1 and 30 minutes (user definable)			
Default Values	1 minute for Flash Points, from ambient up to 100°C (212°F)			
	2 minutes for Flash Points between 100°C to 300°C (212°F to 572°F)			
Cup Material	Aluminium			
Dimensions	256 x 280 x 256mm (10.1 x 11.0 x 10.1")			
Weight	4kg (8.8lb)			
Packing List	Elcometer 6910 Setaflash 'Series 3' closed cup tester, 2ml (0.067fl oz) syringe, gas canister and ignitor, silicone rubber tubing for gas canister to gas jet connection, silicone sample well 'O' ring seal for cup/lid (red coloured), viton sample well 'O' ring seal for cup/lid (black coloured), mains power cable, automatic flash detector probe, 'Series 3' manuals (on CD) and operating instructions			

Accessories

KT006910N001	Cooling Module Option for 0°C (32°F) Ambient Temperature

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0006910M010 is the certificate for model K0006910M010).

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Flash Point

Setaflash 'Series 3' Open Cup Tester

Elcometer 6910/2

The Elcometer 6910/2 Setaflash 'Series 3' Open Cup Tester offers the fastest and most accurate Flash Point instrument at a cost effective price.

Certain substances, classified as "flammable" by Closed Cup Flash Point Testing, may be reclassified as "non-flamable" by combustibility testing. This has significant potential cost reduction implications for the packaging, storage and shipping of many materials.

The Elcometer 6910 Setaflash features an open cup for flash/no-flash finite determinations or sustained combustion tests, audible and on-screen prompts and easy calibration. Flash Point tests can be conducted in less than two minutes with a temperature range from ambient to 300°C (572°F)

A manually operated flame sweeping arm is fitted to the cup and gas is supplied from the integral tank via the control valve. The flash or sustained combustion characteristics of the sample are observed visually by passing the test flame over the sample.

STANDARDS:
ASTM D 4206, BS 3900-A11, ISO 9038

Technical Specification				C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK6910M011	K0006910M011	K0US6910M011	Elcometer 6910/2 Setaflash 'Series 3' Open Cup Tester	○

Sample Size and Temperature Range	2ml (0.067fl oz) for Flash Points, from ambient up to 100°C (212°F)
	4ml (0.135fl oz) for Flash Points between 100°C to 300°C (212°F to 572°F)
Test Times	1 to 99 minutes
Default Values	1 minute for Flash Points up to 100°C (212°F)
	2 minutes for Flash Points between 100°C to 300°C (212°F to 572°F)
Cup Material	Aluminium
Dimensions	256 x 280 x 256mm (10.1 x 11 x 10.1")
Weight	4kg (8.8lb)
Packing List	Elcometer 6910 Setaflash 'Series 3' open cup tester, 2ml (0.067fl oz) syringe, gas canister and ignitor, silicone rubber tubing for gas canister to gas jet connection, silicone sample well 'O' ring seal for cup/lid (red coloured), viton sample well 'O' ring seal for cup/lid (black coloured), mains power cable, automatic flash detector probe, 'Series 3' manuals (on CD) and operating instructions

Accessories	
KT006910N001	Cooling Module Option for 0°C (32°F) Ambient Temperature

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0006910M011 is the certificate for model K0006910M011).

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29

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Elcometer 6910/3   Setaflash 'Series 3' Active-Cool Closed Cup Tester

The Setaflash 'Series 3' Active-Cool Tester offers the same features as the Elcometer 6910/1 Setaflash but is fitted with a cup suitable for testing corrosive samples.

It has been designed to carry out Flash/No Flash tests rapidly and efficiently to determine the Flash Point of liquids and semi-solids in the 10°C to 130°C (50°F to 266°F) temperature range.

Flash Point is automatically detected using a thermally activated detector, reducing the risk of operator error and minimising the potential danger of inhaling fumes during a test. A rechargeable gas tank with On/Off switch and fine adjustment are integral to the unit. Supplied with a 2ml (0.067fl oz) syringe and ignitor.

Features:
- Flash Point test in less than 2 minutes
- Small sample size - 2ml (0.067 fl oz) or 4ml (0.135 fl oz)
- Electronic Peltier cooling effect
- °C or °F display

STANDARDS:
ASTM D 1655, ASTM D 3278, ASTM D 3828, ASTM D 3934, ASTM E 502, BS 3900-A11, BS3900-A13, BS 3900- A14, BS 6664-3, BS 6664-4, EN 456, ISO 3679, ISO 3680

Technical Specification   C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK6910M013	K0006910M013	K0US6910M013	Elcometer 6910/3 Setaflash 'Series 3' Active-Cool	○
Sample Size and Temperature Range	2ml (0.067fl oz) for Flash Points up to 100°C (212°F)			
	4ml (0.135fl oz) for Flash Points between 100°C to 300°C (212°F to 572°F)			
Test Times	1 to 99 minutes			
Default Values	1 minute for flash points up to 100°C (212°F)			
	2 minutes for flash points between 100°C to 300°C (212°F to 572°F)			
Cup Material	Corrosion resistant steel			
Dimensions	256 x 280 x 256mm (10.1 x 11.0 x 10.1")			
Weight	5kg (11.3lb)			
Packing List	Elcometer 6910 Setaflash 'Series 3' active-cool closed cup tester, 2ml (0.067fl oz) syringe, gas canister and ignitor, silicone rubber tubing for gas canister to gas jet connection, silicone sample well 'O' ring seal for cup/lid (red coloured), viton sample well 'O' ring seal for cup/lid (black coloured), mains power cable, automatic flash detector probe, 'Series 3' manuals (on CD) and operating instructions			

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0006910M013 is the certificate for model K0006910M013).

Film Application & Test Charts

For numerous products, such as paint, ink, varnishes, glue and cosmetics, the reliability of many laboratory tests is directly related to the quality and consistency of the samples.

To ensure repeatability and reproducibility, any measurements made on such coatings, whether for the purpose of describing their physical properties (drying time, elasticity, abrasion etc.) or their appearance, (gloss, colour, shade, etc.) are made on the basis of uniform and comparable samples with precisely controlled thickness.

In order to meet such specific demands, Elcometer has a wide range of high precision film applicators and spiral bar coaters for greater repeatability and reproducibility when undertaking a large number of sample tests.

For the greatest repeatability and reproducibility, manual application is not sufficient as speed and smoothness of flow are also critical factors.

Elcometer's range of Motorised Film Applicators has been designed specifically to ensure:
- constant speed
- smoothness of operation - ensuring no jerks which create ridges and variation in thickness
- repeatability and reproducibility every time

Available with a highly engineered table, available with or without a vacuum and heating element, each Elcometer Motorised Film Applicator is accurately measured using a Co-ordinate Measuring Machine to meet an incredibly high level of flatness.

The average variation on Elcometer Application Tables is 2.3µm (0.092mil), while the average variation on glass used on some low cost tables is 12.0µm (0.48mil).

If a 100µm (4mils) coating is tested, readings taken using an Elcometer table would produce readings between 97.7 (3.9mils) and 102.3µm (4.1mils). On glass, the readings produced would be between 88 (3.5mils) and 112µm (4.48mils) - a 47% variation.

Elcometer also offers a wide range of Leneta Test Charts to meet all specific requirements, which feature a combination of black and white markings. These are the two extremes of colour thereby indicating the thickness of coating required to cover the whole colour spectrum.

This range of Leneta Test Chart covers a variety of testing needs including the hiding power of coatings, ink qualities, penetration, spreading rates and opacity.

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Elcometer 4340   **Motorised/Automatic Film Applicator**

The Elcometer 4340 Motorised Film Applicator is the essential machine for preparing a wide variety of product samples including paint, varnish, cosmetics, glue.

11 pre-set transverse speeds from 0.5 - 10cm per second

Ideal for testing paint, varnish, cosmetics, glue etc.

Smooth aluminium table - much smoother than glass - for better repeatability
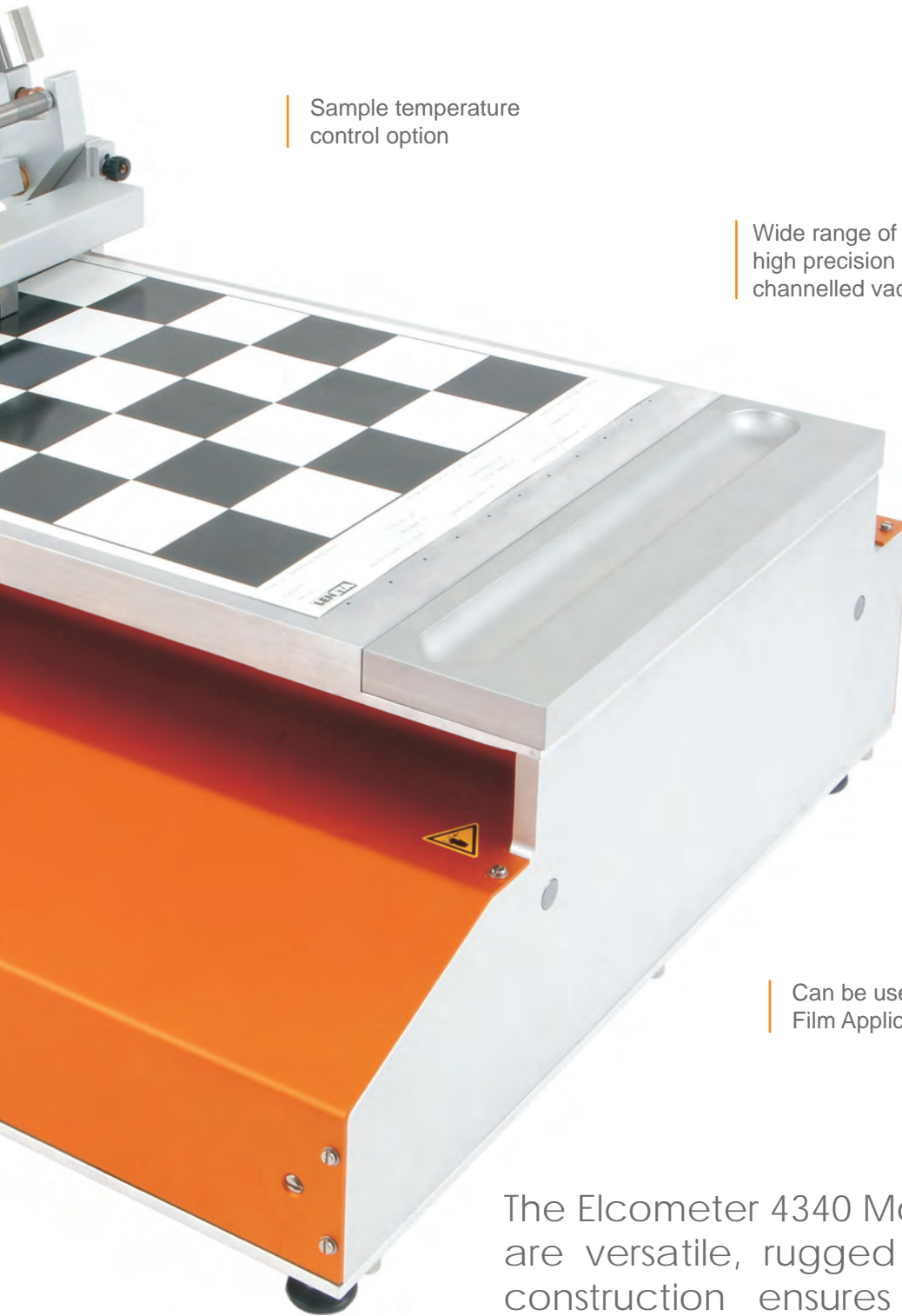
11 pre-set speeds and adjustable stroke length

Each table is engineered to the highest flatness rating

Use up to 3 film applicators simultaneously

elcometer®

Sample temperature control option

Wide range of standard and high precision perforated and channelled vacuum tables

High quality samples produced for highly reliable laboratory testing

Adjustable travel carriage with 'stop' at end of travel

Can be used with Elcometer Film Applicators

The Elcometer 4340 Motorised Film Applicators are versatile, rugged and precise. The rigid construction ensures a smooth, consistent application without the ridges often associated with film application.

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Elcometer 4340   **Motorised/Automatic Film Applicator**

The Elcometer 4340 provides total consistency and reproducibility on various substrates including contrast charts, sheet steel, plastic foils and glass. All Elcometer 4340 models have 11 pre-set speeds and adjustable stroke length with quick release system.

STANDARDS:
ASTM D 823-C
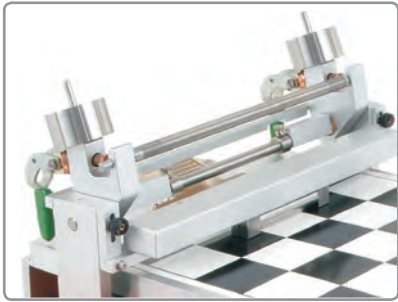
Interchangeable head attachments

Easily switch between film applicators

- Spiral Bar Head Attachment
- Standard Applicator Head Attachment
- Combined Spiral/Standard Head Attachment

Durable & Rugged

- Sturdy rigid design to ensure minimal movement during film application
- Up to 15 years of standard use
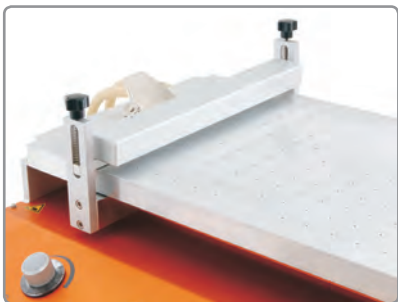
Choice of Bed

- Standard flat table
- Single channel vacuum table
- Double channel vacuum table
- Perforated

Smooth & multiple concurrent tests

- Use up to 3 film applicators simultaneously
- Test up to 2 Leneta test charts simultaneously
- Able to test up to 2 test areas on perforated tables

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Motorised/Automatic Film Applicator

Elcometer 4340

A range of applicator head attachments is available separately, allowing the user to select the most appropriate for their specific use and Standard (if applicable).

The Elcometer 4340 range of motorised Film Applicators comes as one universal base with user selectable head attachments - allowing the flexibility to test using standard film applicators (filmographs), spiral bar coaters or using the combined attachment of both the film applicator and spiral bar attachment. For a complete range of film applicators and spiral bar coaters etc. see pages 37 - 41.

Each table is engineered to the highest flatness rating (up to five times flatter than glass - see page 36), and can be supplied in a number of variations to meet your specific test requirements, simply select the model from the Technical Specification below.

Film Applicator Attachment

Spiral Bar Attachment

Combined Film Applicator and Spiral Bar Attachment

Technical Specification   C

Part Number	Test Chart Clip	Standard Table	Perforated Vacuum Table+	Single Channel Vacuum Table+	Double Channel Vacuum Table+	Temperature Bath* +15 to 100°C (59 to 212°F)	Electrically Heated Ambient to 200°C (Ambient to 392°F)	Certificate
K4340M10-	■	■				■		○
K4340M11-	■	■						○
K4340M12-‡	■	■					■	○
K4340M100	■		■					○
K4340M101	■			■				○
K4340M102	■				■			○
K4340M110	■		■			■		○
K4340M111	■			■		■		○
K4340M112	■				■	■		○
K4340M120 ‡	■		■				■	○
K4340M121 ‡	■			■			■	○
K4340M122 ‡	■				■		■	○

Dimensions	780 x 490 x 320mm (30.7 x 19.3 x 12.6") Weight 29kg (64lb)
Voltage	110-240V
Packing List	Elcometer 4340 Film Applicator, power cable(s) and operating instructions

Motorised Film Applicator Attachments

Models

M10-, M100, M101, M102	M11-, M12-, M110, M111, M112, M120, M121, M122	
KT004340N001	KT004340N101	Film Applicator Attachment
KT004340N002	KT004340N102	Spiral Bar Coater Attachment#
KT004340N003	KT004340N103	Combined Film Applicator & Spiral Bar Coater Attachment#

‡ For 110V unit, add D to end of part number, e.g. K4340M120D
\# Each Spiral Bar Coater Attachment is supplied with a rubber mat

+ Vacuum Pump supplied separately (Elcometer 4930, see page 36)
* Supplied ready to be fitted with a temperature bath. Temperature bath is not supplied

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK4340M10- is the certificate for model K4340M10-).

elcometer

Elcometer 4800 & 4900 — Free Standing Vacuum Tables

Elcometer offers a comprehensive range of vacuum tables to provide an ideal surface for manual application of films on test charts or samples and is available in two formats:

- The Elcometer 4800 - this aluminium table with a channel around the edge holds flexible test pieces, e.g test charts, plastic film and paper, absolutely flat (2.3µm variation over a 100mm length).

- The Elcometer 4900 - made of perforated aluminium, keeps a wider range of test pieces absolutely flat (2.3µm variation over a 100mm length), including glass, plastic sheets, contrast charts etc.

The perforated version is suitable for thicker, more substantial test pieces.

The channel version is suitable for thinner materials such as plastics and films which may distort under the perforated version method.

All beds are engineered to be flat and precise with little variation for "perfect" flatness. Both Elcometer standard tables, channelled and perforated vacuum tables are 5 times flatter than glass.

Perforated tables have two sample size settings, 210 x 297mm (8.3" x 11.7") and 297 x 420mm (11.7" x 16.6"), selected by means of a switch on the table.

Technical Specification

Part Number	Description	Paper Size	Table Dimensions mm	inches
K0004800M002	Channelled Vacuum Table	A4	220 x 300	8.5 x 12
K0004900M001	Perforated Vacuum Table	A4	220 x 300	8.5 x 12
K0004900M002	Perforated Vacuum Table	A3	300 x 450	12 x 18

Accessories

Part Number	Description	
KTUK4930M001	Vacuum Pump (UK 240V) -	used to provide vacuum to the Vacuum Tables
KT004930M001	Vacuum Pump (EUR 220V) -	used to provide vacuum to the Vacuum Tables
KTUS4930M001	Vacuum Pump (US 110V) -	used to provide vacuum to the Vacuum Tables

Elcometer 4350 — Non-Slip Rubber Mat

A non-slip rubber mat designed to minimise surface defects. Suitable for use with the Elcometer Spiral Bar Coaters and the Elcometer 4340 Motorised Film Applicators; see pages 37 - 38 and 32 - 35.

Technical Specification

Part Number	Description	Depth mm	inches	Dimensions mm	inches
KT004350P051	Elcometer 4350/51 Non-Slip Rubber Mat	5	0.2"	510 x 140	20 x 5.5
KT004350P052	Elcometer 4350/52 Non-Slip Rubber Mat	5	0.2"	510 x 250	20 x 9.8

Spiral Bar Coaters

Elcometer 4361

Made of stainless steel and consisting of a cylindrical bar wound with stainless steel wire, these spiral bar coaters are used to apply a predetermined thickness for coatings with high levelling characteristics.

- A wide range of different wire diameters to measure coating thicknesses from 4 to 500µm (0.157 to 19.685mils).

- 2 standard bar widths are available,140mm (5.5") or 250mm (9.8"), allowing the user to apply the correct film width dependent on the substrate or test chart width. Other widths are available on request.

Ideal for use with the Elcometer 4340 Motorised Film Applicators; see pages 32-35. A range of standard and heated vacuum tables are available; see page 36 for more information.

STANDARDS:
ASTM D 4147

Technical Specification

Bar Width 140mm (5.5")		Coating Thickness		Part Number	Model	Coating Thickness	
Part Number	Model	µm	mils			µm	mils
K0004361P001	Elcometer 4361/1	4	0.157	K0004361P017	Elcometer 4361/17	66	2.598
K0004361P002	Elcometer 4361/2	6	0.236	K0004361P018	Elcometer 4361/18	70	2.755
K0004361P003	Elcometer 4361/3	8	0.315	K0004361P019	Elcometer 4361/19	76	2.992
K0004361P004	Elcometer 4361/4	10	0.393	K0004361P020	Elcometer 4361/20	80	3.149
K0004361P005	Elcometer 4361/5	12	0.472	K0004361P021	Elcometer 4361/21	90	3.543
K0004361P006	Elcometer 4361/6	16	0.630	K0004361P022	Elcometer 4361/22	100	3.937
K0004361P007	Elcometer 4361/7	20	0.787	K0004361P023	Elcometer 4361/23	110	4.330
K0004361P008	Elcometer 4361/8	26	1.024	K0004361P024	Elcometer 4361/24	120	4.724
K0004361P009	Elcometer 4361/9	30	1.181	K0004361P025	Elcometer 4361/25	130	5.118
K0004361P010	Elcometer 4361/10	34	1.338	K0004361P026	Elcometer 4361/26	140	5.511
K0004361P011	Elcometer 4361/11	38	1.496	K0004361P027	Elcometer 4361/27	150	5.905
K0004361P012	Elcometer 4361/12	40	1.574	K0004361P029	Elcometer 4361/29	175	6.890
K0004361P013	Elcometer 4361/13	46	1.811	K0004361P030	Elcometer 4361/30	200	7.874
K0004361P014	Elcometer 4361/14	50	1.968	K0004361P031	Elcometer 4361/31	300	11.811
K0004361P015	Elcometer 4361/15	56	2.205	K0004361P032	Elcometer 4361/32	400	15.748
K0004361P016	Elcometer 4361/16	60	2.362	K0004361P033	Elcometer 4361/33	500	19.685

elcometer ®

Elcometer 4360

Spiral Bar Coaters

Made of stainless steel and consisting of a cylindrical bar wound with stainless steel wire, these spiral bar coaters are used to apply a predetermined thickness for coatings with high levelling characteristics.

- A wide range of different wire diameters to measure coating thicknesses from 4 to 500µm (0.157 to 19.685mils).

- 2 standard bar widths are available,140mm (5.5") or 250mm (9.8"), allowing the user to apply the correct film width dependent on the substrate or test chart width. Other widths are available on request.

Ideal for use with the Elcometer 4340 Motorised Film Applicators; see pages 32 - 35. A range of standard and heated vacuum tables are available; see page 36 for more information.

STANDARDS:
ASTM D 4147

Technical Specification

Bar Width 250mm (9.8")		Coating Thickness		Part Number	Model	Coating Thickness	
Part Number	Model	µm	mils			µm	mils
K0004360P001	Elcometer 4360/1	4	0.157	K0004360P017	Elcometer 4360/17	66	2.598
K0004360P002	Elcometer 4360/2	6	0.236	K0004360P018	Elcometer 4360/18	70	2.755
K0004360P003	Elcometer 4360/3	8	0.315	K0004360P019	Elcometer 4360/19	76	2.992
K0004360P004	Elcometer 4360/4	10	0.393	K0004360P020	Elcometer 4360/20	80	3.149
K0004360P005	Elcometer 4360/5	12	0.472	K0004360P021	Elcometer 4360/21	90	3.543
K0004360P006	Elcometer 4360/6	16	0.630	K0004360P022	Elcometer 4360/22	100	3.937
K0004360P007	Elcometer 4360/7	20	0.787	K0004360P023	Elcometer 4360/23	110	4.330
K0004360P008	Elcometer 4360/8	26	1.024	K0004360P024	Elcometer 4360/24	120	4.724
K0004360P009	Elcometer 4360/9	30	1.181	K0004360P025	Elcometer 4360/25	130	5.118
K0004360P010	Elcometer 4360/10	34	1.338	K0004360P026	Elcometer 4360/26	140	5.511
K0004360P011	Elcometer 4360/11	38	1.496	K0004360P027	Elcometer 4360/27	150	5.905
K0004360P012	Elcometer 4360/12	40	1.574	K0004360P029	Elcometer 4360/29	175	6.890
K0004360P013	Elcometer 4360/13	46	1.811	K0004360P030	Elcometer 4360/30	200	7.874
K0004360P014	Elcometer 4360/14	50	1.968	K0004360P031	Elcometer 4360/31	300	11.811
K0004360P015	Elcometer 4360/15	56	2.205	K0004360P032	Elcometer 4360/32	400	15.748
K0004360P016	Elcometer 4360/16	60	2.362	K0004360P033	Elcometer 4360/33	500	19.685

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

elcometer®

Baker Film Applicator

Elcometer 3520

The Elcometer 3520 Baker Film Applicator is made of hardened stainless steel with a cylindrical applicator body. These gauges apply a coating of specified thickness and film width on flat, relatively firm substrates.

It can also be used with the Elcometer 4340 Motorised Film Applicators, see pages 32 - 35.

Each Elcometer 3520 Baker Film Applicator has four high precision specified coating thickness sizes for accuracy and is available in a range of film widths.
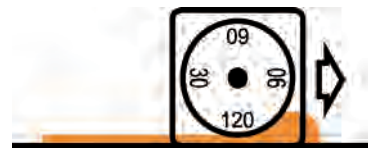
Elcometer 3520
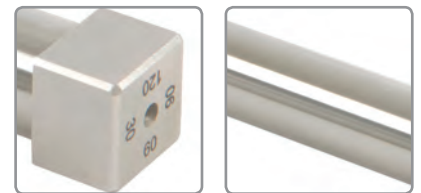
STANDARDS:
ASTM D 823-E

Technical Specification   C

Part Number		Model	Film Thickness					Film Width+		Certificate
Metric	Imperial			µm			mils	mm	inches	
K0003520M001	K0US3520M001	Elcometer 3520/1	30,	60,	90,	120	1, 2, 3, 4	25	1	○
K0003520M002	K0US3520M002	Elcometer 3520/2	30,	60,	90,	120	1, 2, 3, 4	50	2	○
K0003520M003	K0US3520M003	Elcometer 3520/3	30,	60,	90,	120	1, 2, 3, 4	60	2.5	○
K0003520M101	K0US3520M101	Elcometer 3520/101	50,	100,	150,	200	2, 4, 6, 8	60	2.5	○
K0003520M004	K0US3520M004	Elcometer 3520/4	30,	60,	90,	120	1, 2, 3, 4	75	3	○
K0003520M005	K0US3520M005	Elcometer 3520/5	30,	60,	90,	120	1, 2, 3, 4	100	4	○
K0003520M006	K0US3520M006	Elcometer 3520/6	30,	60,	90,	120	1, 2, 3, 4	125	5	○
K0003520M007	K0US3520M007	Elcometer 3520/7	30,	60,	90,	120	1, 2, 3, 4	150	6	○
K0003520M011	K0US3520M011	Elcometer 3520/11	30,	60,	90,	120	1, 2, 3, 4	175	7	○
K0003520M008	K0US3520M008	Elcometer 3520/8	30,	60,	90,	120	1, 2, 3, 4	200	8	○
K0003520M009	K0US3520M009	Elcometer 3520/9	30,	60,	90,	120	1, 2, 3, 4	250	10	○

+ Add 30mm (1.2") to the Film Width to calculate the total width of the applicator

Can be used with the Elcometer 4340 Motorised Film Applicator, seepages 32 - 35

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003520M001 is the certificate for model K0003520M001).
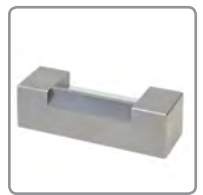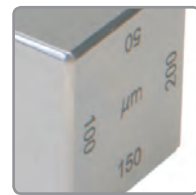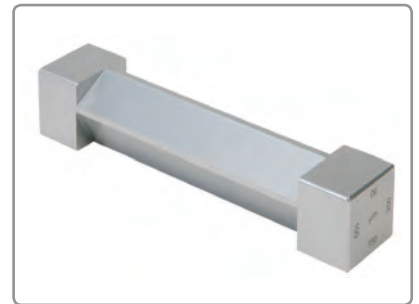
elcometer®

Elcometer 3525 & 3530   Adjustable Baker Film Applicators

The Elcometer 3525 & 3530 are manufactured using the very latest machining techniques to ensure outstanding accuracy. These Baker Film Applicators allow the user to select the specific gap size required. The coating thickness gap size can be set to produce either a uniform film or a film wedge. Each film applicator has thickness markings down each side for fast set up.

Available in two gap size ranges and a number of film widths, these stainless steel applicators can be used manually or with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35.

or

STANDARDS:
ASTM D 823-E

Elcometer 3525
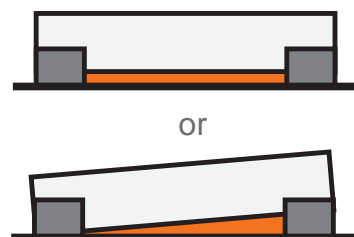
Technical Specification							C
Part Number		Model	Film Thickness		Film Width+		Certificate
Metric	Imperial		µm	mils	mm	inches	
K0003525M001	K0US3525M001	Elcometer 3525/1	0 - 100	0 - 4	50	2	○
K0003525M002	K0US3525M002	Elcometer 3525/2	0 - 100	0 - 4	75	3	○
K0003525M003	K0US3525M003	Elcometer 3525/3	0 - 100	0 - 4	100	4	○
K0003525M004	K0US3525M004	Elcometer 3525/4	0 - 100	0 - 4	150	6	○
K0003525M005	K0US3525M005	Elcometer 3525/5	0 - 100	0 - 4	200	8	○
K0003525M006	K0US3525M006	Elcometer 3525/6	0 - 100	0 - 4	250	10	○
K0003530M001	K0US3530M001	Elcometer 3530/1	0 - 250	0 - 10	50	2	○
K0003530M002	K0US3530M002	Elcometer 3530/2	0 - 250	0 - 10	75	3	○
K0003530M003	K0US3530M003	Elcometer 3530/3	0 - 250	0 - 10	100	4	○
K0003530M004	K0US3530M004	Elcometer 3530/4	0 - 250	0 - 10	150	6	○
K0003530M005	K0US3530M005	Elcometer 3530/5	0 - 250	0 - 10	200	8	○
K0003530M006	K0US3530M006	Elcometer 3530/6	0 - 250	0 - 10	250	10	○

+ Add 30mm (1.2") to the Film Width to calculate the total width of the applicator

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003525M001 is the certificate for model K0003525M001).
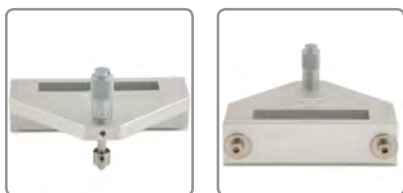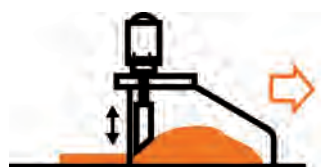
Bird Film Applicator

The Elcometer 3550 & 3540 Bird Film Applicators are easy to clean gauges manufactured to the highest accuracy.

These precision ground stainless steel Bird Film Applicators have a flat edged prismatic body making them suitable for coatings applied to a flat and relatively strong substrate.

The Elcometer 3550 Bird Film Applicator has 1 film thickness, whereas the Elcometer 3540 has 4 thicknesses per applicator.

Both versions are available in a range of film widths and can be used with the Elcometer 4340 Motorised Film Applicators, see pages 32 - 35.

Elcometer 3550   Elcometer 3540

STANDARDS:
ASTM D 823-E
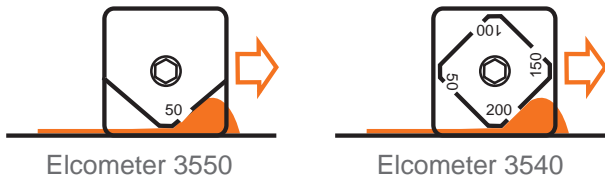
Technical Specification   C

| Part Number | | Model | Film Thickness | | Film Width+ | | Certificate |
Metric	Imperial		µm	mils	mm	inches	
K0003550M001	K0US3550M001	Elcometer 3550/1	50	2	50	2	o
K0003550M002	K0US3550M002	Elcometer 3550/2	50	2	75	3	o
K0003550M003	K0US3550M003	Elcometer 3550/3	50	2	150	6	o
K0003550M201	K0US3525M201	Elcometer 3550/1	75	3	50	2	o
K0003550M202	K0US3525M202	Elcometer 3550/2	75	3	75	3	o
K0003550M203	K0US3525M203	Elcometer 3550/3	75	3	150	6	o
K0003540M001	K0US3540M001	Elcometer 3540/1	50, 100, 150, 200	2, 4, 6, 8	50	2	o
K0003540M002	K0US3540M002	Elcometer 3540/2	50, 100, 150, 200	2, 4, 6, 8	75	3	o
K0003540M003	K0US3540M003	Elcometer 3540/3	50, 100, 150, 200	2, 4, 6, 8	100	4	o
K0003540M004	K0US3540M004	Elcometer 3540/4	50, 100, 150, 200	2, 4, 6, 8	150	6	o
K0003540M005	K0US3540M005	Elcometer 3540/5	50, 100, 150, 200	2, 4, 6, 8	200	8	o
K0003540M006	K0US3540M006	Elcometer 3540/6	50, 100, 150, 200	2, 4, 6, 8	250	10	o

+ Add 30mm (1.2") to the Film Width to calculate the total width of the applicator

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

o Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003550M001 is the certificate for model K0003550M001).

elcometer®

Elcometer 3570

Micrometric Film Applicators

The Elcometer 3570 is made of anodised aluminium with a reservoir and a bevelled blade applicator body, and is suitable for high-precision manual application of high viscosity fluids on to relatively firm substrates.

The gap can be adjusted, in 1micron intervals, from 0 to 1mm by the inclination of the device, using a micrometric screw.

STANDARDS:
ASTM D 823-E

Elcometer 3570

Technical Specification					C
Part Number	Description	Film Thickness	Film Width[+]		Certificate
		μm	mm	inches	
K0003570M201	Elcometer 3570/1 Micrometric Film Applicator	0 - 1000	75	3	○
K0003570M002	Elcometer 3570/2 Micrometric Film Applicator	0 - 1000	100	4	○
K0003570M003	Elcometer 3570/3 Micrometric Film Applicator	0 - 1000	150	6	○
K0003570M004	Elcometer 3570/4 Micrometric Film Applicator	0 - 1000	200	8	○

[+] Add 36mm (1.4") to the Film Width to calculate the total width of the applicator

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003570M001 is the certificate for model K0003570M001).

elcometer®

Casting Knife Film Applicator

Elcometer 3580

The Elcometer 3580 is available in a wide range of film widths and has extended sides to confine the coating during the application and is an ideal gauge for the laboratory.

The film thickness can be adjusted in 10 micron steps from 0 to 6mm by means of two integrated micrometric screws.

Manufactured in anodised aluminium, with a bevelled blade applicator body, the Elcometer 3580 is recommended for manually applying thick, high viscosity fluids, on solid and flat substrates.

Elcometer 3580

STANDARDS:
ASTM D 823-E

Technical Specification   C

Part Number	Model	Film Thickness	Film Width[+]		Certificate
		µm	mm	inches	
K0003580M201	Elcometer 3580/1 Casting Knife Film Applicator	0 - 6000	50	2	○
K0003580M202	Elcometer 3580/2 Casting Knife Film Applicator	0 - 6000	75	3	○
K0003580M203	Elcometer 3580/3 Casting Knife Film Applicator	0 - 6000	100	4	○
K0003580M204	Elcometer 3580/4 Casting Knife Film Applicator	0 - 6000	125	5	○
K0003580M005	Elcometer 3580/5 Casting Knife Film Applicator	0 - 6000	150	6	○
K0003580M006	Elcometer 3580/6 Casting Knife Film Applicator	0 - 6000	175	7	○
K0003580M007	Elcometer 3580/7 Casting Knife Film Applicator	0 - 6000	200	8	○

[+] Add 15mm (0.6") to the Film Width to calculate the total width of the applicator
Also available in Stainless Steel - Contact Elcometer for further information

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003580M201 is the certificate for model K0003580M201).
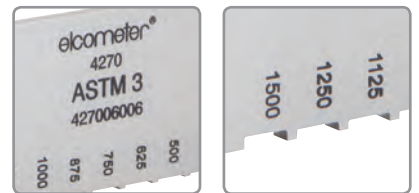
elcometer®

Elcometer 3505

Cube Film Applicators

These two cube film applicators, manufactured from hardened stainless steel, accurately apply either a single or up to five film stripes, each 12mm (0.5" wide).

Ideal for preparing samples for use with the Elcometer 5300 Linear Drying Time Recorder (see page 52) or for simultaneously comparing formulations. Each cube film applicator is supplied with a set of nineteen thickness gauges from 30 - 1000µm (1 - 40mils) to adjust the film thickness.

STANDARDS:
ASTM D 823-E

Technical Specification   C

Part Number Metric	Imperial	Model	Film Thickness µm	mils	Film Width⁺ mm	inches	Number of Stripes	Certificate
K0003505M001	K0US3505M001	Elcometer 3505/1	30 - 1000	1 - 40	12	0.50	1	○
K0003505M202	K0US3505M202	Elcometer 3505/2	30 - 1000	1 - 40	12	0.50	5	○

⁺ Elcometer 3505/1 total width: 26mm (1.0");   Elcometer 3505/2 total width: 146mm (5.7")

Accessories

KT003600P001	19 Metric Thickness Gauges for Calibration
	(30-40-50-60-70-80-90-100-150-200-250-300-400-500-600-700-800-900-1000µm)

Elcometer 3508 & 3560

4 Gap Applicator with Reservoir

These film applicators are precision engineered from hardened stainless steel to provide four film thicknesses in one gauge. Simply rotate the applicator to the required thickness, fill the reservoir with the test coating and draw down a uniform stripe.

The Elcometer 3508 is supplied with two reservoirs, ideal for preparing samples for the Elcometer 1720 Abrasion and Washability Testers (see pages 56 - 61) or for comparing two coatings simultaneously.

STANDARDS:
ASTM D 823-E (Elcometer 3560)

Technical Specification   C

Part Number Metric	Imperial	Model	Film Thickness µm	mils	Film Width⁺ mm	inches	Certificate
K0003560M201	K0US3560M201	Elcometer 3560/1	30, 60, 90, 120	1, 2, 3, 4	60	2	○
K0003560M202	K0US3560M202	Elcometer 3560/2	50, 100, 150, 200	2, 4, 6, 8	60	2	○
K0003508M001	K0US3508M001	Elcometer 3508/1	100, 150, 200, 250	4, 6, 8, 10	2 x 50	2 x 2	○

⁺ Elcometer 3560 total width: 90mm (3.5"); Elcometer 3508 total width: 165mm (6.5")

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003505M001 is the certificate for model K0003505M001).

elcometer®

Sag Tester

Elcometer 4270

Made from stainless steel, the straight scraper has 10 notches of increasing clearance. The Elcometer 4270 Sag Tester is used to establish a coating's resistance to sag due to gravity.

A contrast chart is immediately placed in a vertical position with the thinnest film at the top.
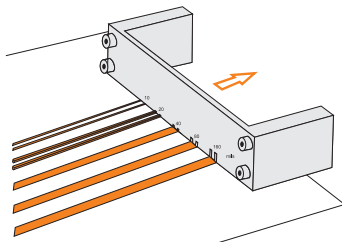
Elcometer 4270

STANDARDS:
ASTM D 4400, FMTS 141 4494. 1

Technical Specification					C
Part Number		Description[+]		Range	Certificate
Metric	Imperial		µm	mils	
K0004270M001	K0US4270M001	Elcometer 4270/1 Sag Tester	75 - 300	3 - 12	○
K0004270M002	K0US4270M002	Elcometer 4270/2 Sag Tester	25 - 150	1 - 6	○
K0004270M203	K0US4270M203	Elcometer 4270/3 Sag Tester	350 - 1500	14 - 60	○
K0004270M204	K0US4270M204	Elcometer 4270/4 Sag Tester	100 - 600	4 - 24	○

[+] Elcometer 4270 total width: 127mm (5")

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0004270M001 is the certificate for model K0004270M001).

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Elcometer 4695

Leneta Test Charts

Elcometer supplies a wide range of Leneta Test Charts, from plain white to those having different patterns of black and white. Made from naturally bright, non-flourescent white paper, these charts contain no optical brighteners that can affect instrumental colour measurements.

Leneta Test Charts are the market standard in today's coatings industry.

Foil Card substrates of steel, aluminium, glass and plastic are also available.

Leneta Test Charts are available in boxes & cases.

STANDARDS:

AS/NZS 1580.213.1, ASTM D 344,
ASTM D 2805, ASTM D 2486,
ASTM D 5150, ASTM D 6441,
BS 3900-D4, DIN 53162-2,
FTMS 141 4121, ISO 2814

Elcometer 4695

Opacity Charts

The term "Opacity Chart" refers to charts on which the test pattern is a simple combination of black and white areas, large enough for wider aperture reflectance instruments, as well as for visual opacity and colour observations.

Used to test the hiding power of the coating, using large black and white areas.

Form 2A	Form 2C	Form 3B	Form 5C	Form 14H

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M003	K0004695M203	Leneta Chart 2A	140 x 254	5 1/2 x 10	2.72kg (6lb)	250	6
K0004695M004	K0004695M204	Leneta Chart 2C	194 x 260	7 5/8 x 10 1/4	4.08kg (9lb)	250	4
K0004695M006	K0004695M206	Leneta Chart 3B	194 x 289	7 5/8 x 11 3/8	4.08kg (9lb)	250	4
K0004695M015	K0004695M215	Leneta Chart 5C	194 x 260	7 5/8 x 10 1/4	4.08kg (9lb)	250	4
K0004695M036	K0004695M236	Leneta Chart 14H	286 x 438	11 1/4 x 17 1/4	5kg (11lb)	125	4

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Brushout Cards

Designed for informal brushout applications, thicker paper is used for the testing of coatings applied with a brush or roller.

The paper stock is almost twice the thickness of regular chart paper to give greater rigidity for more convenient handling - nominal thickness 0.5mm (20 mils).

Brushout Cards are also used widely for drawdowns and colorimetric measurements.

Form 2DX

Form 5DX

Form WDX

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M005	K0004695M205	Leneta Chart 2DX	98 x 152	3$7/8$ x 6	3.18kg (7lb)	500	4
K0004695M016	K0004695M216	Leneta Chart 5DX	98 x 152	3$7/8$ x 6	3.18kg (7lb)	500	4
K0004695M102	K0004695M302	Leneta Chart WDX	98 x 152	3$7/8$ x 6	3.18kg (7lb)	500	4

Duplex Applicator Charts

Originally made to be used with the Duplex Film Applicator, an instrument designed for rapid production of side-by-side drawdowns, they now serve mostly as generic paint test charts.

Form 6F6

Form WF

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M019	K0004695M219	Leneta Chart 6F6	76 x 184	3 x 7$1/4$	2.27kg (5lb)	500	6
K0004695M103	K0004695M303	Leneta Chart WF	76 x 184	3 x 7$1/4$	2.27kg (5lb)	500	6

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

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Elcometer 4695 — Display Charts/Spreading Rate

Display Chart

Spreading Rate Chart

These charts employ time-tested, diagonally striped patterns, having a strong visual impact that emphasises variations in film opacity. They are frequently used for hiding power display purposes, by means of drawdowns or brushouts.

Spreading Rate Charts (Form 8H) are accurately 0.1 square meters (approximately one square foot) in area, and are used in brushout hiding tests at specified spreading rates as described in ASTM Method D 344.

Form 8B

Form 8H

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M022	K0004695M222	Leneta Chart 8B	194 x 289	7$5/8$ x 11$3/8$	4.08kg (9lb)	250	4
K0004695M023	K0004695M223	Leneta Chart 8H	286 x 438	11$1/4$ x17$1/4$	5kg (11lb)	125	4

Elcometer 4695 — Checkerboard Charts/Spreading Rate Charts

Display Chart

One of the earliest hiding power test surfaces was linoleum with a black and white checkerboard pattern, this was soon replaced by sealed paperboard charts.

Checkerboard Rate Charts (Forms 10A and 10B) are typically used in drawdown hiding tests.

Form 10A

Form 10B

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M029	K0004695M229	Leneta Chart 10A	140 x 254	5½ x 10	2.27kg (6lb)	250	6
K0004695M030	K0004695M230	Leneta Chart 10B	194 x 289	7$5/8$ x 11$3/8$	4.08kg (9lb)	250	4

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

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Metopac™ Metal Test Panels

Painted steel panels, used for measuring the hiding power of powder coatings and industrial enamels.
Available in half black/half white and all black.
The black surface:
Solvent Resistant, Non bleeding, Reflective
- 1% maximum - measured using ASTM Method E1347
White Surface:
Solvent Resistant, Colour Retentive, Reflective, Reflectance
- 80% minimum - measured using ASTM Method E1347
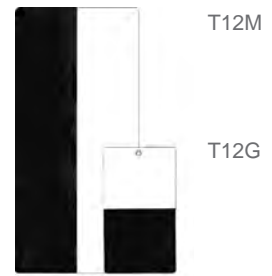
T12M

T12G

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M094	K0004695M294	Leneta Panel T12G	76 x 132	3 x 5$_{3/16}$	3.63kg (8lb)	125	4
K0004695M095	K0004695M295	Leneta Panel T12M	132 x 279	5$_{3/16}$ x 11	1.81kg (4lb)	50	4

Plain White Charts

Available in varying thicknesses and size. The Leneta WDX card comes with convenience hole at the top.

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
Card thickness 0.5mm							
K0004695M102	K0004695M302	Leneta Chart WDX	98 x 152	3$_{7/8}$ x 6	3.18kg (7lb)	500	4
Card thickness 0.3mm							
K0004695M103	K0004695M303	Leneta Chart WF	76 x 184	3 x 7$_{1/4}$	2.27kg (5lb)	500	6

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

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Elcometer 4695 — Unvarnished Test Charts

Form N2A

Unvarnished Test Charts are ideal for testing applications of clear coatings and stains.

The unvarnished (semi-porous) surface simulates wood or unsealed wallboard.

Technical Specification

Part Number Box	Case	Description	Chart Dimensions mm	inches	Box Weight	Quantity per Box	Boxes per Case
K0004695M064	K0004695M264	Leneta Chart N2A	140 x 254	5$1/2$ x 10	2.72kg (6lb)	250	6

Elcometer 4695 — Spray Monitors - Self Adhesive Hiding Power

Form M12

These are pressure sensitive labels with a hiding power test pattern and a sealed, solvent-resistant surface. They are used primarily with metal panels on which the panel alone provides no visual clue as to the thickness of the applied paint film.

When placed on such a surface the Monitor presents a contrasting feature by which to observe how well the coating hides the surface, thereby facilitating film thickness control. It adheres firmly whether air-dried or baked, to present a permanent visual record of film opacity.

Technical Specification

Part Number Box	Case	Description	Chart Dimensions mm	inches	Box Weight	Quantity per Box	Boxes per Case
K0004695M056	K0004695M256	Leneta Spray Monitor M12	25 x 25	1 x 1	0.91kg (2lb)	2000	4

Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 32 - 35

Drying Time

When developing a coating process, it is important to know the exact time it takes for the coating to dry or cure. For multicoat paint systems, having knowledge of the drying time enables the operator to know when any subsequent layers can be applied.

There are many stages involved in the coating drying time. Once a coating has been applied, it levels off under gravity, and, as the coating begins to cure, a thin dry film appears on the surface. The coating then continues to dry until, finally, it is totally cured.

Permeability: Describes how much and how fast moisture transfers through a film as vapour. The film is gripped between a ring fitted with a seal and the cup, which contains a quantity of water or desiccant.

Permeability Cups: When applying a multicoat system, it is often acceptable to apply a subsequent coat before the previous coat has fully cured. Payne Permeability Cups can be used to determine the degree to which the volatile liquid can permeate any subsequent layer.

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Elcometer 5300   Linear Drying Time Recorder

The Elcometer 5300 is designed to determine paint drying time by linear recording, with up to 10 positions (5 each side of the centre column) tested simultaneously.

Ten rods with hemispherical tips, fitted to a carriage, are brought into contact with the fresh films at one end of the test piece and moved lengthwise.

The drying time is calculated from the distance travelled, measured using a graduated rule along the edge, corresponding to the various stages observed on the trace.

The coatings are applied beforehand on glass strips 25mm (0.98") wide and 700mm (27.5") long. Using the Elcometer 3505 Cube Film Applicators (see page 44), it is possible to apply up to five coatings simultaneously on a glass plate.

- The drying time recorder automatically stops at the end of travel
- The load on each ball is 11g (0.37oz), although additional weights can bring this load up to 21g (0.71oz)

Technical Specification   C

Part Number		Description	
UK 240V/ EUR 220V	US 110V		Certificate
K0005300M002	K0US5300M002	Elcometer 5300 Linear Drying Time Recorder	○
Tool Diameter	4.76mm (0.19")		
Speed	6 speeds, between 12mm (0.5") and 600mm (24") per hour		
Dimensions	860 x 420 x 170mm (34 x 16.5 x 6.7")		
Weight	18kg (40lb)		
Packing List	Elcometer 5300, 12 glass strips, 10 x 10g (0.35oz) weights and operating instructions		

For a full range of accessories, see page 53

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0005300M002 is the certificate for model K0005300M002).

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Linear Drying Time Recorder

Accessories

Part Number	Description
K0003505M001	Elcometer 3505/1 Metric Cube Film Applicator - 1 Stripe*
K0US3505M001	Elcometer 3505/1 Imperial Cube Film Applicator - 1 Stripe*
K0003505M202	Elcometer 3505/2 Metric Cube Film Applicator - 5 Stripes*
K0US3505M202	Elcometer 3505/2 Imperial Cube Film Applicator - 5 Stripes*

* see page 44 for details

Part Number	Description
KT005300P002	Ball Tool - set of 5
KT005300P003	Additional 10g (0.35oz) Weights, set of 5

Part Number	Description
KT005300P001	Glass Strip 700 x 25mm (28 x 1"), set of 10
KT005300P004	Glass Plate 700 x 145mm (28 x 5.7"), set of 6

How to use a linear drying time recorder

1 Levelling	2 Basic Trace	3 Ripped Film	4 Surface Trace	5 Dry
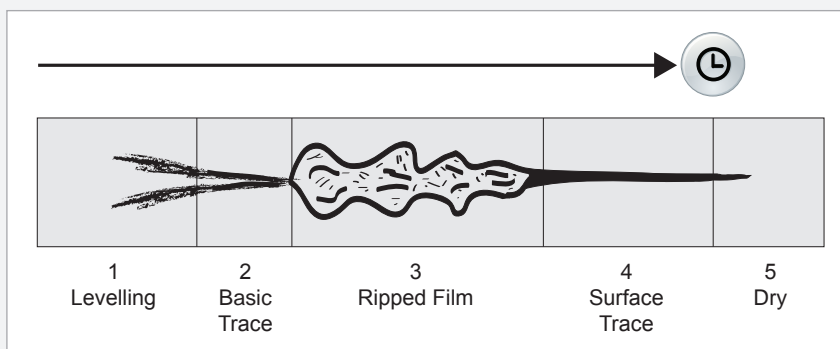
A Linear Drying Time Recorder calculates the drying time using the principle that

Distance = Speed x Time

A ball tip is placed into the coating being tested and the drying time recorder begins to move the ball at a predefined speed. As the coating dries, the visual trace left in the coating by the ball identifies each stage of the cure.

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Elcometer 5100

Payne Permeability Cups

The Elcometer 5100 Payne Permeability Cups are made of anodised aluminium and are used to determine the permeability of films of paints, varnish, plastic, cellophane, etc.

The water evaporates or is absorbed and, after a certain time, the weight change relative to the film thickness is calculated, indicating the degree of permeability or permeance.

STANDARD:
ASTM D1653, ASTM E96,
ISO 7783-1, ISO 7783-2

Technical Specification

Part Number	Description	Area		Volume	
		cm^2	$inches^2$	cm^3	$inches^3$
K0005100M201	Elcometer 5100/1 Payne Permeability Cup	10	1.55	15	0.91
K0005100M202	Elcometer 5100/2 Payne Permeability Cup	30	4.65	50	3.05
K0005100M203	Elcometer 5100/3 Payne Permeability Cup	30	4.65	75	4.58
Packing List	Elcometer 5100 Payne Permeability Cup, storage case and operating instructions				

Accessories

Part Number	Description	Chart Dimensions		Quantity per Box
		mm^2	$inches^2$	
K0004695M112	Leneta Chart RP-1K	219 x 286	8.62 x 11.26	250

How to use Payne Permeability Cups

Prepare the film to be tested using a film applicator and suitable test chart.

Disassemble the permeability cup.

Fill with required liquid (typically water) or dry desiccant (absorbent).

Place the film on to the cup and reassemble making sure the gasket is fitted first.

Weigh the prepared permeability cup and record the result (in grams).

Leave for appropriate time, re-weigh, calculate the change in mass (∆m) & water vapour transmission rate.
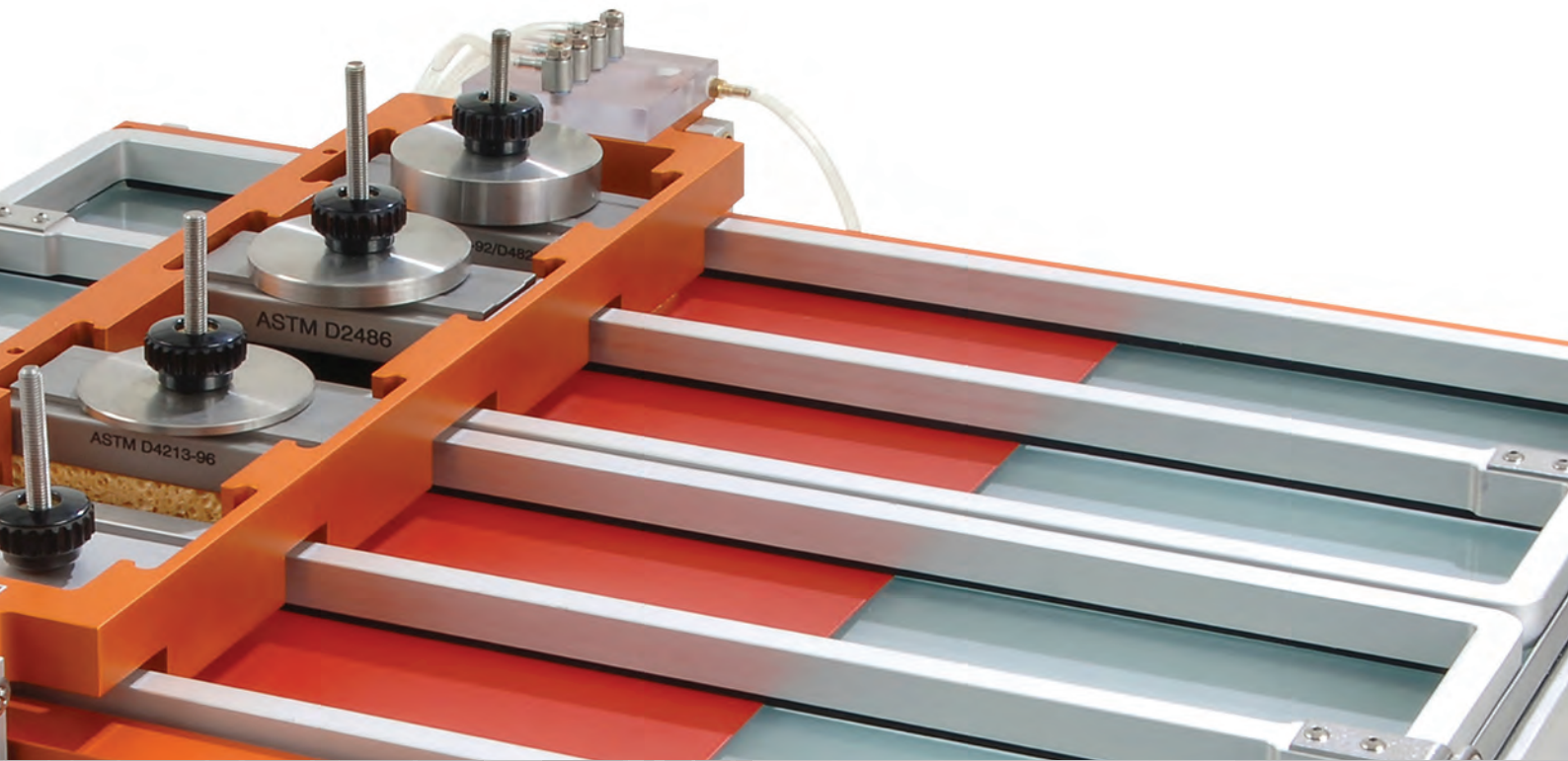
Washability & Abrasion

Improved mechanical resistance to wear is a key requirement of a wide range of products. From coatings to clothing, leather to upholstery, keypads to plastic toys, a product's ability to resist wear is an important characteristic.

There are testing methods relating to the 'abrasion by friction' concept. Others are based on the projection of abrasive particles on to the test specimen. These techniques provide valuable information about materials and processes.

The three tests available are:

- *Friction:* one part moves relative to the other
- *Scrubbing:* wet or dry brush or sponge is moved over the test piece
- *Blast:* abrasive particles are projected on to the test specimen

Although it is difficult to correlate test performance with real life wear conditions, mechanical tests can make an accurate comparison between samples.

Definitions:

Abrasion: The ability of a coating to resist damage caused by a defined material rubbing its surface. Abrasive wear is the erosion of material from a solid surface by the action of another solid.

Washability: The ability of a coating to withstand being washed using either wet or dry scrubbing action. The effect can be determined in terms of coating weight loss, loss of gloss or loss of thickness after the scrubbing process.

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Elcometer 1720

Washability & Abrasion Testers

These robust, reliable and extremely versatile machines have been designed for testing the washability, brushability and resistance of a wide range of materials including paint, lacquers, inks, coatings, leather, wood, plastics, printed material, fabrics etc.

STANDARDS:

AS/NZS 1580.459.1, ASTM D 2486, ASTM D 3450, ASTM D 4213, ASTM D 4488, ASTM D 4828, ASTM F 1319, DIN 53778-2:1983, ECCA T11, EN 12956, EN 13523-11, EN 233/C3.2-A, EN 233/C3.2-B, EN 233/C3.2-C, EN 60730-1-A, GME 60269, ISO 105-X12, ISO 11998, JIS K 5600-5-11, PSA D45 1010, ASTM D1792 - 06 ASTM D2198 -02, ASTM D3206 - 08, ASTM D6279 - 03(2007), MIL-C-3004, MIL-C-46057, MIL-E-11237, MIL-STD-1334B, MIL-P-15422C, FTMS 141, Method 6141, FTMS 141, Method 6142, FTMS Method 536/6701, Federal Specification P-D-220D, P-R-1760, P-W-155C, TT-P-26C(1), TT-P-29K, TT-P-30E(1), TT-P-47G, TT-E-505B, TT-E-506K(1), TT-E-509C, TT-C-535B(2), TT-C-555B(1)

Made from anodised aluminium making it durable and robust

The durable and robust design is steady under test allowing repeatable results, even at the fastest stroke speeds

Rapid tool change

elcometer®

Washability & Abrasion Testers

Test up to 4 samples simultaneously

Multi-lingual digital display

Available with or without an integrated liquid dosing pump

User adjustable stroke length from 10 to 300mm (0.4 to 11.8")

Speed Cycles can be adjusted from 10 to 65 cycles per minute or set to the ISO Standard of 37 cycles /min

With a wide range of tools available, for testing flat and curved samples (see pages 60-61)

Elcometer 1720
Washability Tester

Elcometer 1720 — Washability & Abrasion Testers
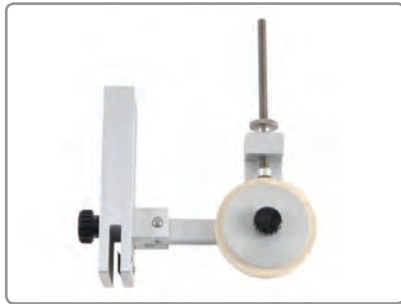
Meeting Standards
- With the wide range of tools available many Standards can be tested in one unit
- All units can be used in accordance with ASTM, DIN, EN and ISO Standards
- Easily adjustable to customers unique applications using the special tools

Interchangeable Tools
- All tools are interchangeable with the rapid tool change system, making the unit ideal for use in accordance with a wide range of Standards.

  For the complete range of tools, see pages 60 - 61

User Adjustable
- Stroke length can be quickly and easily changed by the user to meet their specific requirements between 10 - 300mm (0.4 - 11.8")
- Speed of carriage can be adjusted between 10 and 65 cycles per minute
- Cycle counter can be pre-set for a defined number of cycles from 1 - 32,760

Wet and Dry
- All stations can be tested wet or dry
- Versions are available with or without an internal liquid pump
- Samples can be tested under wet and/or dry conditions simultaneously as each station is separated by a watertight gasket.

Economic
- With the ability to test up to 4 different characteristics simultaneously, significant time can be saved
- With it's rapid tool change system setting up tests is fast and easy.

Washability & Abrasion Testers

Available in 2 versions:
2 station - undertakes two tests at a time,
4 station - tests up to four samples with 4 different tests.

Each station is separated by a water-tight gasket frame allowing dry & wet testing simultaneously.

Stroke speed can be varied between 10 and 65 cycles/min or set to 37 cycles/min to meet ISO Standards.

Stroke length can be adjusted by the user to meet specific requirements, from 10 to 300mm (0.4 to 11.8").

Available with or without liquid dosers, allowing test liquids to be regulated automatically or independently.

Digital display allows easy, accurate speed variation and simple reporting.

The rapid tool change system allows the user to test the samples in accordance with a wide range of National and International Standards on both flat and curved samples simultaneously.

Technical Specification C

Part Number	Description	Certificate
K1720M202	Elcometer 1720 Abrasion Tester, 2 Station (110 - 240V)	o
K1720M204	Elcometer 1720 Abrasion Tester, 4 Station (110 - 240V)	o
K1720M302	Elcometer 1720 Abrasion & Washability Tester, 2 Station (110 - 240V)	o
K1720M304	Elcometer 1720 Abrasion & Washability Tester, 4 Station (110 - 240V)	o
Dimensions	550 x 460 x 320mm (21.7 x 18.1 x 12.6")	
Weight	2 Station: 31.5kg (70lb), 4 Station: 33kg (73lb)	
Packing List	Elcometer 1720, 250µm (10mil) metal strip for ASTM D2486 Standard, sample drip tray, 1 x glass sheet (2 station), 2 x glass sheet (4 station), 1 x specimen holding frame (2 station), 2 x specimen holding frame (4 station), set of 3 tools for instrument set up, 3 x mains leads (UK, EUR and US) and operating instructions. Elcometer 1720 part numbers K1720M302 and K1720M304 also include a liquid dosing bottle, liquid delivery pipe and 2 liquid drain pipes. Tools are supplied separately, please order from the list on pages 60 - 61.	

o Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK1720M202 is the certificate for model K1720M202).

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Elcometer 1720   Washability & Abrasion Testers

The Elcometer 1720 can undertake tests according to a wide range of different Standards and Test Methods by simply changing the abrasive tools. For more information on Standards, please see inside the Front Cover. Please select the required tools from the list on the following two pages. Samples can be tested in a combination of both wet and dry methods.

Tool 1: Wild Boar Brush

Wild boar hair brush and stainless steel brush holder.
Total weight: 250g (8.82oz)

Part Number:	KT001720P003

STANDARDS:
DIN 53778-2:1983

Tool 2: Nylon Brush

Nylon bristle brush, stainless steel brush holder and 177g (6.2oz) mass.
Total weight: 454g (16.01oz)

Part Number:	KT001720P030

STANDARDS:
ASTM D2486

Tool 3: Sponge

Sponge and stainless steel brush holder, 337g (11.9oz).
Total weight: 508g (17.92oz)

Part Number:	KT001720P005

STANDARDS:
ASTM D4213:92, ASTM D4828

Tool 4: Sponge

Sponge and stainless steel brush holder, 337g (11.9oz) and 250g (8.8oz) mass to bring gross weight to 750g.
Total weight: 750g (26.45oz)

Part Number:	KT001720P073

STANDARDS:
ASTM D3450

Tool 5: Sponge / Abrasive

Sponge & stainless steel holder abrasive pads - top and bottom & 76g (2.7oz) mass.
Total Weight: 232g (8.12oz)

Part Number:	KT001720P029

STANDARDS:
ASTM D4213

Tool 6: Abrasive

Aluminium holder, abrasive pads (x5).
Total weight: 135g (4.76oz)

Part Number:	KT001720P036

STANDARDS:
ISO 11998

Tool 7: Universal Material Clamp

Stainless steel holder allowing users to fix their own test sample or abrasive material. Ideal for abrasion and wear of labels, textiles, ink etc.

Part Number:	KT001720P207

Tool 8: Linear Abrader "Crockmeter"

This tool is ideal for testing abrasion on both curved and flat surfaces and for testing colour fastness of fabrics. Supplied with a removable stainless steel rod, test felt, textile fixing ring and a set of additional masses - 2x100g (3.5oz), 1x200g (7oz), 1x500g (17.6oz). Total weight (excluding masses): 200g (7oz)

Part Number:	KT001720P074

STANDARDS:
ASTM F1319, ISO 105-X12, PSA D45 1010

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Washability & Abrasion Testers

Tool 9: Linear Abrader

For testing the resistance to abrasion of automotive components, includes a felt disc of 10mm (0.4") diameter and 10mm (0.4") thick working under a mass of 400g (14.1oz).
Total weight: 400g (14.11oz)

Part Number: KT001720P075

STANDARDS:
GME 60269

Tool 9A: Linear Abrader

As Tool 9 but with 16mm (0.63") diameter felt wool disc.
Total weight: 820g (28.9oz)

Part Number: KT001720P075-1

Tool 9B: Linear Abrader

Felt holder for 16mm (0.63") diameter felt wool disc working under a mass of 900g (31.7oz)
Total weight: 900g (31.74oz)

Part Number: KT001720P075-2

STANDARDS:
EN 13523-11, ECCA T11

Tool 10: Curved Sample Tool

Height adjustable with an elbow joint for curved samples, this tool is ideal for testing abrasion resistance of both coatings and inks. Supplied with felt disc, rod for masses, 1x50g (1.75oz), 1x100g (3.5oz), 2x200g (7oz) and 2x500g (17.5oz) mass

Part Number: KT001720N003

STANDARDS:
EN 60730-1-A

Accessories

Part Number	Description
KT001720P004	Wild Boar Brush for Tool 1
KT001720P009	Nylon Brush for Tool 2
KT001720P006	Sponge (5) for Tools 3 & 4
KT001720P141	Sponge/Abrasive (5) for Tool 5
KT001720P037	Abrasive Pads (10) for Tool 6
KT001720P064	Abrasive Pads (100) for Tool 6
KT001720P051	Abrasive G 120 Sheets (4), for Tools 1 & 2
KT001720P008	25m Abrasive Roll for Tool 7
KT001720P062	Felt Disks (2) for Tool 10
KT001720N009	Non-Abrasive Scrub Medium - SC1
KT001720N002	Abrasive Scrub Medium - SC2
KT001720P016	50g Mass (To fit tools 1 - 8, 10)
KT001720P017	100g Mass (To fit tools 1 - 8, 10)
KT001720P018	200g Mass (To fit tools 1 - 8, 10)
KT001720P031	227g Mass (To fit tools 1 - 8, 10)
KT001720P019	500g Mass (To fit tools 1 - 8, 10)
KT001720P214	Glass Plate, 478 x 165mm
KT001720P012	ASTM Test Foil 250µm (10mils)
KT001720P013	10m Replacement Channel Gasket
K0004695M068	Scrub Test Panels - see page 62

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Elcometer 4695   Scrub Test Panels

Form P121-10N

Fig 1. Typical failure using shim per ASTM D2486 Method A

Fig 2. Typical failure without

In a typical scrub test, the coating is applied to the Leneta Scrub Test Panel at a specified film thickness, allowed to dry and then subjected to scrubbing with a straight-line scrub tester.

When used in accordance with ASTM D2486, Method A, a 10 mil shim is inserted under the panel to accelerate failure and thereby reduce testing time. The scrub resistance is the number of scrub cycles required to remove the coating to a specified end point.

Alternatively, the loss in weight is determined after a specified number of scrub resistance cycles, with calculation of equivalent loss in film thickness.

These Scrub Test Panels are ideal for use with the Elcometer 1720 Washability & Abrasion Testers, see pages 56 - 61.

Technical Specification

Part Number Box	Case	Description	Chart Dimensions mm	inches	Quantity per Box	Boxes per Case
K0004695M068	K0004695M268	Leneta Scrub Test Panel P121-10N	165 x 432	6 1/2 x 17	100	5
K0004695M069	K0004695M269	Leneta Scrub Test Panel P122-10N	165 x 432	6 1/2 x 17	100	5

Accessories

KT001720P012	ASTM Test Foil 250µm (10mils)

elcometer.

Taber® Linear Abrasers

Elcometer 5750

Whatever your product, be it curved, round, big or small, the Linear Abraser from Taber® can test it all. Using a free floating head to follow the contours of the sample, the Taber® 5750 is the ideal abrasion tester for flat or curved surfaces. It may also be used as a scratch tool, using the scratch kit accessory.

Abrasion media, length of stroke, load and speed of stroke can all be user defined to meet specific requirements.

The Linear Abraser uses a range of Wearasers™. The size and shape of a pencil eraser, the Wearaser™ uses the same high quality Taber® abrasive media as used on the Taber® Rotary Abrasers, simulating real-life wear conditions.

Features:
- Stroke lengths of 12.7, 25, 76 and 102mm (0.5, 1.0, 3.0 and 4.0")
- Variable stroke speed from 2 - 75 cycles per minute
- Preset stroke speed buttons for 2, 15, 25, 30, 40 and 60 cycles per minute
- Variable load from 350 - 2100g (12.4 - 74.1oz) with optional weights
- Stainless steel Wearaser™ holder (Collet) for use with vitrified or resilient Wearasers™
- Laser alignment guide

STANDARDS:

AATCC Method 8, ASTM D 2197, ASTM D 5178, ASTM D 6279, ASTM F1319, ISO 105-X12, JIS L 0849

Technical Specification

Part Number	Description
ST985750	Elcometer Taber® 5750 Linear Abraser (230V/115V, 50/60Hz)
Dimensions	208 x 228 x 279mm (20 x 9 x 11")
Weight	10kg (22lb)
Packing List	Elcometer Taber® 5750 Linear Abraser, Wearaser™ Collet and Spine Shaft, 3 x 250g (8.82oz) discs, 10 x CS-10 Wearasers™, 5 x H-18 Wearasers™, power cords (230V and 115V), allen key, Wearaser™ depth tool gauge, 50 x S-14 refacing strips, hand brush and operating instructions

Accessories

Part Number	Description	Abrasive Action	Composition
ST130684	CS-10F Resilient Wearaser™ (pack of 10)	Very Mild	Rubber and Abrasive Grain
ST130685	CS-10 Resilient Wearaser™ (pack of 10)	Mild	Rubber and Abrasive Grain
ST130686	CS-17 Resilient Wearaser™ (pack of 10)	Harsh	Rubber and Abrasive Grain
ST130681	H-18 Non-resilient Wearaser™ (pack of 5)	Medium, Coarse	Vitrified Clay
ST130682	H-22 Non-resilient Wearaser™ (pack of 5)	Very Coarse	Vitrified Clay
ST131852	Wearaser™ Holder (collet) Kit - Aluminium		
ST131852-1	Wearaser™ Holder (collet) Kit - Plastic		
ST130570	Crockmeter Kit (includes finger, clamp ring and cloths)		

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Elcometer 5135 & 5155   Taber® Rotary Abrasers

Used primarily in the testing of ceramics, plastics, textiles, metals, leather, rubber and painted, lacquered and electroplated surfaces, accelerated wear test procedures have also been written into many test specifications including ASTM, ISO, TAPPI and DIN - as well as automotive manufacturing procedures around the world.

The Taber® Rotary Abraser is an industry standard used in the wear and durability testing and is available with either a single test head or dual testing heads, which allows the user to test two different or identical materials simultaneously.

Choose from a wide variety of abrading wheels and abraser accessories to simulate real-life wear conditions,

Features :
• Platform speeds 60 and 72rpm
• Balanced, calibrated arms and wheel mounts
• Vacuum system with precision height adjustment
• Sealed aluminium housing with membrane control panel and digital display

STANDARDS:

ANSI INCITS 322, AS/NZS 1580.403.2, AS/NZS 4266.2, ASTM C1353, ASTM C217, ASTM C241, ASTM C501, ASTM D1044, ASTM D3389, ASTM D3884, ASTM D4060, ASTM D6037, ASTM D-7255, ASTM F1478, ASTM F1978, ASTM F362, ASTM F 510, BS 5599, DIN 52347, DIN 53109, DIN 53754, DIN 53799, DIN 68861-2, ECCA T16, EN 13329, EN 13523-16, EN 14323, EN 14327, EN 14354, EN 14431, EN 14688, EN 14864, EN 1504-2, EN 438-2, EN 660-2, EN 13696, FORD BN108-02, GM9515P, ISO 10074, ISO 14656, ISO 24338, ISO 3537, ISO 4586-2, ISO 5470-1, ISO 7784-1, ISO 7784-2, ISO 9352, JIS A 1453, JIS H 8503, JIS K 5600-5-8, JIS K 5600-5-9, JIS K 6404-22, JIS K 6902, JIS K 7205, NEMA LD 3, NF Q03-055, SAE J 1530, SAE J 1847, SAE J 365, SAE J 948, SIS 923509, SS 923509, TAPPI T 476, UNE 135203-1, UNE 48250, UNE 56842, UNE 56843, UNE 56868, UNE 57095

Technical Specification

Part Number		Description
UK/EUR 230V	US 115V	
ST985135-2	ST985135-1	Elcometer Taber® 5135 Single Head Abraser
ST985155-2	ST985155-1	Elcometer Taber® 5155 Dual Head Abraser
Dimensions & Weights		Elcometer Taber® 5135: 279 x 406 x 279mm (11 x 16 x 11"), 19.50kg (43lb)
		Elcometer Taber® 5155: 482 x 355 x 279mm (19 x 14 x 11"), 31.75kg (70lb)
		Vacuum unit: 279 x 279 x 610mm (11 x 11 x 24"),10.00kg (22lb)
Packing List		Elcometer Taber® Abraser, auxiliary weights - 1 x 500g (17.64oz) load and 1 x 1000g (35.27oz) load, specimen holder 109.2mm (4.3") O/D (E-100-125), holding down ring (E-100-101), 100 x refacing discs (S-11), Calibrase® Wheel set (CS-10), Calibrade® Wheel set (H-18), vacuum unit with suction hose, round brush and operating instructions
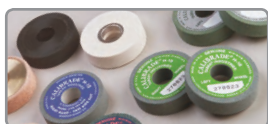
For the complete range of Abrading Accessories, see pages 65 - 67

Abrading Wheels

Taber® Abrading Wheels are available in five levels of abrasiveness to suit a wide range of material testing applications.

Wool, felt or plain rubber wheels test delicate materials or abrasiveness of materials such as dental powders.

Wheels featuring abrasive particles in a resilient matrix of rubber or a hard matrix of vitrified clay are suitable for stiffer materials.

*   *Calibrase®* : resilient abrasive wheel - rubber and aluminium oxide
*   *Calibrade®*: a non-resilient abrasive wheel - vitrified clay and silicon carbide
*   *Plain Rubber*: contains no abrasive particles unless used with sandpaper strips
*   *Tungsten Carbide*: severe cutting and tearing action with helical teeth for use on resilient materials such as rubber, leather and floor coverings

Technical Specification

Elcometer 5135 and 5155 Taber® Rotary Abrasers (2 wheel set)

Part Number	Description	Abrasive Action	Composition
ST125319	CS-5 Resilient Wheel (Pack of 2)	None	Wool Felt
ST125321	CS-10F Resilient Wheel (Pack of 2)	Very Mild	Rubber and Abrasive Grain
ST125320	CS-10 Resilient Wheel (Pack of 2)	Mild	Rubber and Abrasive Grain
ST125322	CS-17 Resilient Wheel (Pack of 2)	Harsh	Rubber and Abrasive Grain
ST125345	S-35 Non-resilient Wheel (Pack of 2)	Severe Cutting	Tungsten Carbide
ST125323	H-10 Non-resilient Wheel (Pack of 2)	Coarse	Vitrified Clay
ST125324	H-18 Non-resilient Wheel (Pack of 2)	Medium, Coarse	Vitrified Clay
ST125325	H-22 Non-resilient Wheel (Pack of 2)	Very Coarse	Vitrified Clay
ST125326	H-38 Non-resilient Wheel (Pack of 2)	Very Fine, Hard	Vitrified Clay
ST125344	CS-0, S-32 Resilient Wheel (Pack of 2)	Very Mild	Non-Abrasive Rubber
ST125564	Sand Paper Strips for use with CS-0,S-42	Medium	Sand Paper Strips (pack of 100)
ST121124	Sand Paper Strips for use with CS-0, S-42	Fine	Sand Paper Strips (pack of 100)

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Elcometer 5135 & 5155 Taber® Rotary Abrasers

Accessories

Multi-Media Attachment

This attachment is used to recreate contact surface wear caused by liquids, fluids and powders. Measures the abrasivity of materials including paints, pigments, adhesives, sealants, pastes, additives etc.

If you require either the Elcometer Taber® 5135 or Taber® 5155 ready assembled with the Multi-Media Attachment, please contact Elcometer.

Part Number: ST985500

Sample Cutter

The Model 5000 Sample Cutter will cut a precise 106mm (4.2") circular sample with a 6.35mm (0.25") centre hole to prepare your specimens for use with the Elcometer Taber® Abrasers.

An easy counter-clockwise cutting motion allows you to cut a variety of materials. Optional pads, which allow cutting thicknesses of 0.03mm (0.001") to 6.35mm (0.25"), are also available.

Part Number: ST985000

Grit Feeder Attachment

Provides a unique method to evaluate 3-body abrasion resistance on a variety of materials. Aluminium oxide grit particles are evenly distributed on to the specimen wear path and pass under a pair of leather wheels. This loose grit acts as an abradant aiding the action that contributes to the physical breakdown of materials.

The Abraser Vacuum is attached to the grit feeder and continuously removes both abraded material and used grit.

The Grit distributor and vacuum removal nozzle heights are adjusted using a thumbscrew.

Two versions are available, Model 155 and Model 255. The Model 155 uses an alignment guide screw to set the position of the instrument. An alignment block is incorporated into the base of Model 255, to ensure the correct location of the grit feeder in relation to the Abraser.

Both models are supplied complete with:
• S-39 Leather wheel set
• S-38 Standardisation Plates
• S-41 #240 Aluminium oxide
• Alignment guide and mounting hardware

Part Number: ST980503-1	Model 155
Part Number: ST980503-2	Model 255

Taber® Rotary Abrasers

Quiet Cabinet

Comprising an upper and lower unit, this solid wood cabinet is suitable for use in a laboratory environment and achieves an approximate 20% reduction in operating sound level.

The top cabinet provides a convenient, dust-free work space for the Abraser and features a Plexiglas® viewing window to monitor testing and removable front for easy transfer of the Abraser in and out of the cabinet.

The base cabinet holds the Abraser Vacuum Unit and includes an inbuilt exhaust system for effective air circulation.

Both cabinets offer ample room to store test specimens, supplies and accessories. The Quiet Cabinet can be purchased as a complete unit or the top and base separately. The lower cabinet exhaust system is available for 230V/50Hz or 115V/60Hz.

Technical Specification

Part Number	Description
ST129497	Complete 230V - both upper and base cabinets
ST128372	Complete 115V - both upper and base cabinets
ST129498	Base unit only 230V - includes vacuum unit
ST128371	Base unit only 115V - includes vacuum unit
ST128370	Upper unit only - work space and viewing window

Calibration Verification Kit

A cost effective method that enables users to verify that an instrument is in calibration, or requires attention. Each kit is individually calibrated providing a reliable check system.

Kit allows you to verify:
- Longitudinal alignment of abraser arm
- Transverse alignment of abraser arm
- Wheel tracking and wear pattern
- Bearing integrity (tracking pattern compliance)
- Vacuum nozzle orifice size
- Minimum vacuum nozzle suction force
- S-30 Weartrac precision wheels (x1 set)

Supplied complete with:
- S-45 Wheel tracking cards (x15)
- Vacuum nozzle suction and orifice gauge
- Vacuum nozzle O-ring
- Dual unit vacuum plug
- Taber® Abraser clean-up hose

Technical Specification

Part Number	Description
ST132030	Calibration Verification Kit

ELCOMETER 1720
ABRASION & WASHABILITY TESTER

Repeatable and reproducible test results, time after time after time

From viscosity to film application, abrasion and washability to coating thickness; Elcometer's range of high quality instruments ensure accurate, repeatable and reproducible test results, every time.

Viscosity	Film Application	Wet & Dry Abrasion	Coating Thickness
A wide range of flow, dip & Zahn cups together with our rotational & Krebs viscometers accurately measure the viscosity of coatings, inks, adhesives and pastes.	Our range of manual & automatic film applicators ensure smooth, reproducible, accurate and reliable application of a wide range of coatings & product samples.	From coatings and inks to paper and clothing materials our abrasion testers are ideal for testing abrasion, washability and resistance of a wide range of materials.	Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.
See page 7	See page 31	See page 55	See page 181

Hardness & Scratch Resistance

Hardness can be defined as a material's resistance to permanent deformation. In the coatings industry, hardness measurement can be used to determine the resistance of the coating to scratching from general wear and tear and also if a coating is fully cured.

Hardness can be defined as a material's resistance to permanent deformation.

The term "Hardness" is used to refer to different properties of material, specifically:

• Resistance to scratch and wear
• Resistance to penetration/indentation

Depending on the requirements, there are various methods for testing hardness. Some are dedicated to characterise coatings and others are more suitable for testing bulk materials such as metals, plastics, rubber or elastomers.

Resistance to Scratch and Wear Method:
To assess a coating's resistance to scratch there are a number of different instruments that can be used:
• Pencil Hardness Tester - marking
• Sclerometer - scratch
• Clemen Apparatus - scratch/indentation
• Scratching and Shearing Instrument - scratch

Resistance to Indentation Method:
There are many instruments available to assess the resistance to penetration. For coatings in particular, there are three common methods where the depth of penetration of a weighted tool is used to show the coating's resistance to penetration:
• Buchholz
• Barcol
• Shore

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Elcometer 3080

Pencil Hardness Tester

This is a simple and effective technique to evaluate the hardness of many coatings.

The pencil lead, prepared beforehand by using the special pencil sharpener and rubbing it on fine abrasive paper (400 grade), is maintained at an angle of 45° and pushed with uniform pressure on to the sample, leaving either a superficial trace or causing destruction down to the substrate.

The Elcometer 3080 Pencil Hardness Tester is supplied complete with stand and a series of 14 pencils, ranging from 6B to 6H hardness values.
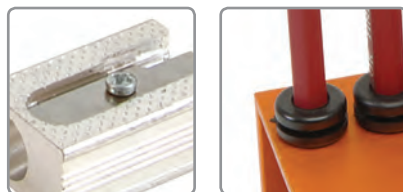
STANDARDS:
ASTM D 3363, BS 3900-E19, ECCA T4, EN 13523-4, ISO 15184, JIS K 5600-5-4

Technical Specification

Part Number	Description
K0003080M003	Elcometer 3080 6B to 6H Pencil Hardness Tester with Stand
Dimensions	330 x 280 x 330mm (13 x 11 x 13")
Weight	1kg (2.2lb)
Packing List	Set of 14 pencils - 6B to 6H, x 2 pencil sharpeners, abrasive paper block, storage stand, operating instructions

Accessories

Part Number	Description	Part Number	Description
T99923042-1	12 Hardness Pencils (6B)	T99923042-8	12 Hardness Pencils (F)
T99923042-2	12 Hardness Pencils (5B)	T99923042-9	12 Hardness Pencils (H)
T99923042-3	12 Hardness Pencils (4B)	T99923042-10	12 Hardness Pencils (2H)
T99923042-4	12 Hardness Pencils (3B)	T99923042-11	12 Hardness Pencils (3H)
T99923042-5	12 Hardness Pencils (2B)	T99923042-12	12 Hardness Pencils (4H)
T99923042-6	12 Hardness Pencils (B)	T99923042-13	12 Hardness Pencils (5H)
T99923042-7	12 Hardness Pencils (HB)	T99923042-14	12 Hardness Pencils (6H)
T99923039	Set of 14 Pencils (6B to 6H)		
T501190451	Pencil Sharpener (6H to 2B)		
T501190452	Pencil Sharpener (3B to 6B)		

Pencil Hardness Tester

The pencil hardness test, also referred to as the Wolff-Wilborn test, uses the varying hardness values of graphite pencils to evaluate a coating's hardness.

The Elcometer 501 has been designed to ensure that the cylindrical pencil lead is maintained at a constant angle of 45° and exerts a force of 7.5N (1.68lbF).

The pencil lead, prepared beforehand using the special sharpener and abrasive paper, is inserted into the Elcometer 501 and pushed over the smooth, flat coated surface. The lowest hardness value of the pencil which marks the coating determines the coating's hardness rating.

STANDARDS:
ASTM D 3363, BS 3900-E19, ECCA T4, EN 13523-4, ISO 15184, JIS K 5600-5-4

Technical Specification   C

Part Number	Description	Certificate
H501----1	Elcometer 501 Pencil Hardness Tester	o
Dimensions (with Pencils)	130 x 130 x 50mm (5 x 5 x 2")	
Weight	2.1kg (4lb)	
Packing List	Elcometer 501 Pencil Hardness Tester, pencil set (14 pencils, grades 6B - 6H), positioning block, 2 x pencil sharpener, abrasive paper block, carry case and operating instructions	

Accessories

Part Number	Description	Part Number	Description
T99923042-1	12 Hardness Pencils (6B)	T99923042-8	12 Hardness Pencils (F)
T99923042-2	12 Hardness Pencils (5B)	T99923042-9	12 Hardness Pencils (H)
T99923042-3	12 Hardness Pencils (4B)	T99923042-10	12 Hardness Pencils (2H)
T99923042-4	12 Hardness Pencils (3B)	T99923042-11	12 Hardness Pencils (3H)
T99923042-5	12 Hardness Pencils (2B)	T99923042-12	12 Hardness Pencils (4H)
T99923042-6	12 Hardness Pencils (B)	T99923042-13	12 Hardness Pencils (5H)
T99923042-7	12 Hardness Pencils (HB)	T99923042-14	12 Hardness Pencils (6H)
T99923039	Set of 14 Pencils (6B to 6H)		
T501190451	Pencil Sharpener (6H to 2B)		
T501190452	Pencil Sharpener (3B to 6B)		

o Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCH501----1 is the certificate for model H501----1).

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Elcometer 3086

Motorised Pencil Hardness Tester

Traditional pencil hardness testers can be limited in their reproducibility and repeatability by two key factors; the uniformity of the carriage speed and the variation of the applied force by the user as the manual tester is moved across the coating.

The Elcometer 3086 Motorised Pencil Hardness Tester, using the same test methods and principles as the Elcometer 501 pencil hardness tester, removes both of these variables by being fully independent. The internal motor drives the unit at a constant, uniform speed across the coated surface, exerting a fixed, user determined force between 0 - 10N (0 - 2.25lbF).

Using the pencil lead holder, pencil leads of varying hardness values can be quickly interchanged to determine a coating's hardness rating.

Manufactured from anodised aluminium, the Elcometer 3086 can travel forwards (chip method) or backwards (indentation method), as required.

STANDARDS:
ASTM D 3363, BS 3900-E19, ECCA T4, EN 13523-4, ISO 15184, JIS K 5600-5-4

Technical Specification C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK3086M001	K0003086M001	K0US3086M001	Elcometer 3086 Motorised Pencil Hardness Tester	○
Dimensions	280 x 140 x 240mm (11 x 5.5 x 9.4")			
Weight	3.8kg (8.4lb)			
Packing list	Elcometer 3086, lead holder, lead set (14 packs of leads, grades 6H to 6B), positioning block, abrasive sharpener, abrasive paper and operating instructions			

Accessories

Part Number	Description	Part Number	Description
KT003084P220	Spare Metal Lead Holder		
KT003084P001	12 Hardness Leads (6B)	KT003084P008	12 Hardness Leads (F)
KT003084P002	12 Hardness Leads (5B)	KT003084P009	12 Hardness Leads (H)
KT003084P003	12 Hardness Leads (4B)	KT003084P010	12 Hardness Leads (2H)
KT003084P004	12 Hardness Leads (3B)	KT003084P011	10 Hardness Leads (3H)
KT003084P005	12 Hardness Leads (2B)	KT003084P012	10 Hardness Leads (4H)
KT003084P006	12 Hardness Leads (B)	KT003084P013	10 Hardness Leads (5H)
KT003084P007	12 Hardness Leads (HB)	KT003084P014	10 Hardness Leads (6H)

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003086M001 is the certificate for model K0003086M001).

Sclerometer Hardness Tester

Elcometer 3092

The Elcometer 3092 tests the hardness of a coating by moving a Tungsten Carbide Tip over the coating with predetermined force.

The body of the instrument contains a cursor fitted with a screw lock and a round tip, compressed by one of the four springs corresponding to the four printed scales:

- *Grey spring:*   0-3N (0.671lbF)
- *Red spring:*   0-10N (2.248lbF)
- *Blue spring:*   0-20N (4.49lbF)
- *Green spring:*   0-30N (6.74lbF)

The spring force can be set by the "collar"; compressing the spring increases the force with which the tip is pushed on to the surface of the test piece. By making short, straight movements while gradually increasing the load, the user can observe the force at which the tip leaves a mark or destroys the coating.

Each Elcometer 3092 is supplied in a case with a 0.75mm (0.03") diameter tungsten carbide tip and 3 springs (grey, red and blue). An optional green spring of 0 - 30N is also available.

STANDARDS:
AS 3894.4, EN 438-2, ISO 4586-2

Technical Specification

Part Number	Description
K0003092M201	Elcometer 3092 Sclerometer Hardness Testers - 3 ranges
Dimensions	165 x 24 x 16mm (6.5 x 1 x 0.6")
Weight	370g (13oz)
Packing List	Elcometer 3092 Sclerometer, tool with 0.75mm (0.03") diameter tungsten carbide tip, 3 springs (grey, red and blue), carry case and operating instructions

Accessories

Part Number	Description
KT003092P001	0.5mm (0.02") Tungsten Carbide Tip
KT003092P002	0.75mm (0.03") Tungsten Carbide Tip
KT003092P003	1.0mm (0.04") Tungsten Carbide Tip
KT003092P008	90° Diamond Point Cone, 90µm (3.54mils) Radius - ISO Type
KT003092P004	Grey Spring 0 - 3N (0 - 0.67lbF)
KT003092P005	Red Spring 0 - 10N (0 - 2.248lbF)
KT003092P006	Blue Spring 0 - 20N (0 - 4.49lbF)
KT003092P007	Green Spring 0 - 30N (0 - 6.74lbF)

elcometer®

Elcometer 3000

Manual Clemen Unit
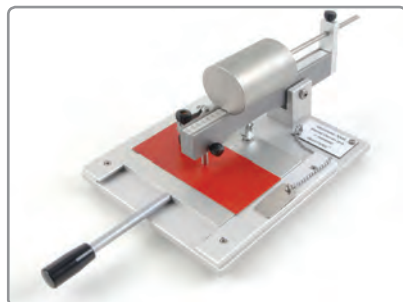
The Elcometer 3000 Clemen Unit is a robust and simple-to-use instrument for evaluation of the resistance to scratching of a coated surface. The sample can be metal, wood, glass, plastic or other hard materials.

A tool is fitted with an hemispherical end of 1mm (0.04") diameter (standard), lowered gradually on to the surface of the sample which is then pulled linearly 60mm (2.36").

As the sample is pulled the tool lowers automatically on to the sample, moves along it and gently rises up.

Depending on the load applied, varying degrees of penetration of the tool into the coating are observed - from a superficial trace to total destruction.

Motorised Clemen Unit

To ensure consistent, repeatable and reproduceable tests, not affected by human variation in speed etc. the Motorised Clemen Unit automatically brings the tool gently in contact with the sample, moves across the coating and then gently lifts it with the automatic Start/Stop function. The contact of the tool with the metallic substrate is indicated by a lamp and voltmeter.

Elcometer offer a range of cutting tools, please see Accessories below.

STANDARDS:
AS/NZS 1580.403.1, BS 3900-E2, DIN 53799, ECCA T12, EN 13523-12, ISO 1518-1:2011, JIS K 5600-5-5

Technical Specification C

Part Number	Description	Certificate
K0003000M001	Elcometer 3000 Manual Clemen Unit	○
K0003000M003	Elcometer 3000 Motorised Clemen Unit (UK 240V / EUR 220V)	○
K0US3000M003	Elcometer 3000 Motorised Clemen Unit (US 110V)	○
Min Sample Width	75mm (2.95")　　　Variable Load　　0 - 500g (176.4oz)	
Dimensions	Manual: 410 x 200 x 155mm (16.1 x 7.9 x 6.1"), Motorised: 460 x 280 x 330mm (18 x 11 x 13")	
Weight	Manual: 6kg (13.2lb), Motorised: 20kg (44lb)	
Packing List	Elcometer 3000 Manual, 1kg (35.27oz) weight,1mm (0.04") ball tool and operating instructions	
	Elcometer 3000 Motorised, 1kg (35.27oz) x 4 weights, 1mm (0.04") ball tool and operating instructions	

Accessories

Part Number	Description
KT003000P021	1mm (0.04") Ball Tool in Tungsten Carbide
KT003000N001	2mm (0.08") Cutting Tool in Tungsten Carbide
KT003000N013	VW Cutting Tool
KT003000N002	1cm² (0.15 inch²) Rubber Tool (to be used as a guide to the dryness of a sample)
KT003000N015	Adjustment Kit to test from 5 to 20mm (0.02 to 0.8")
KT007210M001	Illuminated Microscope (x30)
KT003025P007	Magnifier (x10)

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003000M003 is the certificate for model K0003000M003).

Scratch/Shear Tester

Elcometer 3025

The Elcometer 3025 is a motorised device to test the resistance of many materials to scratching, shearing, gouging, marring, scraping and engraving. This portable instrument tests materials up to 12.7mm (½") thick by 101mm (4") square or round.

The height of the scale beam is adjusted by the user to match the thickness of the sample. The tool, a conical diamond tip, is then placed on the sample and the instrument is activated by the user with the On/Off switch.

The tip leaves a trace mark and the extent of this, in relation to the load used, indicates the degree of hardness. The turntable rotates at a constant 5rpm to ensure repeatability and reproducibility of tests. By changing the load on the tool, from 0 - 1000g (0 - 2.2lb), the sample's resistance to deformation can be evaluated.

Sample Cutter

The Sample Cutter cuts precise 106mm (4.2") circular samples with a 6.35mm (0.25") centre hole to prepare specimens for use with the Taber® Abrasers.

An easy counter-clockwise cutting motion allows the user to cut a variety of materials. Optional pads allowing cutting thicknesses of 0.03mm (0.001"), 4.74mm (0.187") and 6.35mm (0.25") are available.
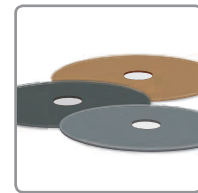
STANDARDS:
EN 438-2, ISO 4586-2

Technical Specification

Part Number			Description
UK 240V	EUR 220V	US 110V	
K0UK3025M001	K0003025M001	K0US3025M001	Elcometer 3025 Scratch/Shear Tester
Dimensions	445 x 190 x 150mm (17 x 7.8 x 6")		
Weight	6.8kg (14.9lb)		
Packing List	Elcometer 3025 and operating instructions		

Accessories

Part Number	Description
ST985000	Sample Cutter
ST131569	Sample Cutter Upper Pad – 4.74mm (0.187")
ST131570	Sample Cutter Upper Pad – 6.36mm (0.250")
KT003025P007	Magnifier (x10)

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Elcometer 3095

Buchholz Hardness Tester

Measuring a coating's hardness using the indentation method, the Elcometer 3095 Buchholz Hardness Tester consists of a bevelled disc indenting tool which is fitted into a stainless steel block exerting a constant test load of 500g (17.6oz).

The gauge is placed on to the coating for 30 seconds and then removed after 30 seconds. The length of any subsequent indentation in the coating is measured using the graduated microscope.

The result is expressed as units of Buchholz Indentation Resistance using the scale printed in the operating instructions (see below).

STANDARDS:
BS 3900-E9, DIN 53153, ISO 2815, NF T30-052

Technical Specification   C

Part Number	Description	Certificate
K0003095M001	Elcometer 3095 Buchholz Hardness Tester	○
Dimensions	360 x 310 x 120mm (14.2 x 12.2 x 4.7")	
Weight	2.9kg (6.4lb)	
Packing List	Elcometer 3095 Buchholz Hardness Tester, indentation tool with bevelled disc and two locating pins, pin adjusting shim, x20 illuminated microscope, indentation locator template, hexagonal wrench, plastic carry case and operating instructions	

Accessories

Part Number	Description
KT003095P001	Spare Pin Supports (x2)
KT003095P002	Bevelled Hardened Steel Disc Indenter

Measure of Buchholz Hardness

Indentation Length		Indentation Resistance	Indentation Depth		Minimum coating thickness for which a measurement is valid	
µm	mm		µm	mils	µm	mils
20	0.8	125	5	0.2	15	0.59
21	0.85	118	6	0.24	20	0.79
23	0.9	111	7	0.28	20	0.79
24	0.95	105	7	0.28	20	0.79
25	1.0	100	8	0.31	20	0.79
38	1.05	95	9	0.35	20	0.79
28	1.1	91	10	0.39	20	0.79
29	1.15	87	11	0.43	25	1
30	1.2	83	12	0.47	25	1
33	1.3	77	14	0.55	25	1
35	1.4	71	16	0.63	30	1.18
38	1.5	67	18	0.71	30	1.18
41	1.6	63	21	0.83	35	1.38
43	1.7	59	24	0.94	35	1.38

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003095M001 is the certificate for model K0003095M001).

Barcol Impressor Hardness Tester

These easy to use hardness testers are ideal for testing the hardness of soft metals, plastics, fibreglass and leather.

Making sure the indenter point is perpendicular to the surface being tested, the instrument is placed on to the sample and a light pressure is exerted against the instrument driving the spring-loaded indenter point into the material. The hardness reading is instantly indicated on the dial.

There are three models in the range:

Elcometer 3101/1   Model 934-1: for soft metals such as aluminum and its alloys, brass, copper, and some of the harder plastics and fiberglass. This unit meets ASTM Standard D2583.
Elcometer 3101/2   Model 935: for softer plastics and very soft metals
Elcometer 3101/3   Model 936: for extremely soft materials such as lead, linoleum and leather

To ensure the Barcol Hardness Tester is in calibration, a number of Standard Test Discs are available. Please select the appropriate Test Disc from the list of Accessories below to supplement the disc supplied.

All results are recorded in Barcol Units (BU).

STANDARDS:
AS 3894.4, ASTM B 648, ASTM D 2583, NF P38-501

Technical Specification

Part Number	Description
K0003101M001[a]	Elcometer 3101/1 Barcol Hardness Tester Type 934/1 at 25-150 Brinell Hardness
K0003101M002[b]	Elcometer 3101/2 Barcol Hardness Tester Type 935 at 50-100 Rockwell
K0003101M003[c]	Elcometer 3101/3 Barcol Hardness Tester Type 936
Dimensions	152 x 106 x 50mm (6 x 4 x 2")
Weight	900g (2lb)
Packing List	Elcometer 3101, adjusting spanner, 2 x indenting points, appropriate standard test disc and operating instructions

Accessories

Part Number	Description	
KT003101P001	Spare Indenter point for Elcometer 3101/1 and Elcometer 3101/2	
KT003101P006	Spare Indenter point for Elcometer 3101/3	
KT003101P202	Standard Test Disc 934-1;	87 - 89 BU (Pack of 1)
KT003101P002	Certified Test Disc 934-1;	87 - 89 BU (Pack of 5)
KT003101P203	Standard Test Disc 934-1;	43 - 48 BU (Pack of 1)
KT003101P003	Certified Test Disc 934-1;	43 - 48 BU (Pack of 5)
KT003101P204	Standard Test Disc 935;	87 - 89 BU (Pack of 1)
KT003101P004	Certified Test Disc 935;	87 - 89 BU (Pack of 5)
KT003101P205	Standard Test Disc 936;	48 - 50 BU (Pack of 1)
KT003101P005	Certified Test Disc 936;	48 - 50 BU (Pack of 5)

[a] Supplied with Standard Test Disc 934-1; 43 - 48 BU, Standard Test Disc 934-1; 87 - 89 BU
[b] Supplied with Standard Test Disc 935; 87 - 89 BU
[c] Supplied with Standard Test Disc 936; 48 - 50 BU

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Elcometer 3120

Shore Durometer

The Elcometer 3120 range of durometers is widely used to test the hardness of soft materials. A round point indents the material under a fixed force spring and the hardness is displayed on the dial in Shore Hardness Units.

The instrument can be either hand-held or fitted to an optional stand for increased repeatability.

Note: The Elcometer 3120 range of Shore Durometers encompasses a number of hardness values. Please refer to the table below.

STANDARDS:
ASTM D 2240, BS 7442-3.2, DIN 53505, FIAT 50411, ISO 868, ISO 7267-2, NF T51-123, NF T 51-174

Technical Specification

C

Part Number Without Certificate	With Certificate	Description	Certificate
K0003120M001	K0003120M015	Elcometer 3120 Shore Durometer A	o
K0003120M008	-	Elcometer 3120 Shore Durometer A with Max indicator	
-	K0003120M025	Elcometer 3120 Shore Durometer A with Max indicator and 12.5N weight	o
K0003120M005	K0003120M018	Elcometer 3120 Shore Durometer D	o
K0003120M009	-	Elcometer 3120 Shore Durometer D with Max indicator	
Dimensions		50 x 50 x 110mm (1.9 x 1.9 x 4.3")	
Weight		300g (10.58oz)	
Packing List		Elcometer Shore Durometer and operating instructions. A Check Piece is supplied with Elcometer Shore Durometers A and D	

Accessories

Part Number	Description
KT003120N002	Test Stand BS 61 II with 10N/12.5N Load for Shore A, B & O
KT003120N005	Test Stand BS 61 II with 50N Load & Control Ring for Shore D, C & DO

Material Relative Hardness Range

← Soft	Medium	Hard →

Shore A ASTM D2240, DIN 53505, ISO 868, ISO 7267-2

Shore D ASTM D2240, DIN 53505, ISO 868, ISO 7267-2

o Calibration Certificate available under the separate part number listed.

DIN Scratching Tool

Elcometer 1538

The Elcometer 1538 has interchangeable carbide cutters for the preparation of specimens to be used for corrosion testing. Supplied complete with a 0.5mm (0.02") or 1mm (0.04") cutter.

A Renault-version of the tool with a blade adjustment device to ensure accurate settings, is also available.

STANDARD:
DIN 53167

Technical Specification C

Part Number	Description	Certificate
K0001538M201	Elcometer 1538 DIN Scratching Tool with 1mm (0.04") Cutter - CASS Test	○
K0001538M202	Elcometer 1538 DIN Scratching Tool with 0.5mm (0.02") Cutter - Salt Spray Test	○
K0001538M004	Elcometer 1538 DIN Scratching Tool with 0.5mm (0.02") Cutter - Renault Version	○
K0001538M005	Elcometer 1538 DIN Scratching Tool with 1mm (0.04") Cutter - Renault Version	○
Weight	113g (4oz)	
Packing List	Elcometer 1538 DIN Scratching Tool, hexagonal wrench, cutter, storage case, operating instructions	

Accessories

Part Number	Description
KT001538N002	Spare 0.5mm (0.02") Cutter
KT001538N001	Spare 1mm (0.04") Cutter

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0001538M201 is the certificate for model K0001538M201).

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Elcometer 1537

ISO Scratching Tool

The Elcometer 1537 ISO Scratching Tool is a simple but effective instrument which is used to scratch the surface of samples in preparation for adhesion, salt spray and corrosion tests. The tool is held horizontally and pulled across the sample to produce the scratch.

The Elcometer 1537 has a tungsten carbide blade which is set to give a 90° cutting angle with a 75° cutting edge.

Certificate of Conformity available upon request.
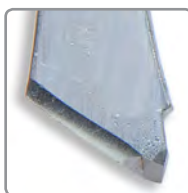
STANDARDS:
BS 7479, EN 22063, ISO 2063, ISO 7253, ISO 9227, NF A91-124

Technical Specification

Part Number	Description
K0001537M001	Elcometer 1537 ISO Scratching Tool
Dimensions	200 x 45 x 20mm (7.8 x 1.7 x 0.8")
Weight	100g (3.5oz)
Packing List	Elcometer 1537 ISO Scratching Tool, storage case, operating instructions

Elasticity & Deformation

The performance of coatings when influenced by external stresses caused by stretching, bending or impact, determines their suitability for their designed application.

A coating designed for use in the coil coating industry, for example, should have the ability to stretch as the substrate is formed into its desired shape without damage.

Deformation or damage can reduce the protective quality and appearance of the coating including colour change, adhesion, gloss, etc.

A coating designed for industrial use should be able to withstand an acceptable level of impact during the life of the product.

In order to characterise a coating's performance to elongation and deformation, a number of repeatable and reproducible tests have been developed.

- **Cylindrical & Conical Mandrel Bend Test**
  A coated metal sheet is bent over a conical or cylindrical mandrel and any subsequent cracks, colour change, adhesion etc. of the coating are evaluated. Corresponding results, produced by decreasing mandrel sizes, indicate the degree of elasticity of the coating.

  A conical mandrel allows the user to undertake fewer tests to achieve a similar result to cylindrical mandrels.

- **Cupping Test**
  A coated metal sheet is subjected to a gradual deformation by a polished die being pushed from beneath the coating - i.e. from the reverse side of the sheet.

- **Variable Impact Tests**
  There are two methods: either a weight with a punch attached falls on a coated metal sheet or a weight falls on to a punch which is resting on the coated metal sheet. In either test, the damage caused is observed and evaluated. These methods are used to identify how the coating performs under a rapid deformation process.

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Elcometer 1500

Cylindrical Mandrel on a Stand

The Elcometer 1500 is a simple instrument for determining the elasticity, adhesion and cracking of dry paint on flat specimens, consisting of a mandrel support which also serves as a test stand.

Coated metal sheets, maximum 150mm (5.9") in length x 100mm (3.93") wide, are manually and successively bent around mandrels of decreasing diameter until cracks appear.

How to use the Cylindrical Mandrel on a Stand

Technical Specification

Part Number	Description
K0001500M002	Elcometer 1500/2 Metric Set of 13 Cylindrical Mandrels on a stand from 2 to 32mm
K0US1500M001	Elcometer 1500/1 Imperial Set of 7 Mandrels from ⅛" to 1"
Mandrel Size	Metric Version: 2, 3, 4, 5, 6, 8, 10, 12, 13, 16, 20, 25, and 32mm
	Imperial Version: ⅛, ¼, ⅜, ½, ⅝, ¾, 1"
Dimensions	178 x 138 x 145mm (7 x 5.3 x 5.7")
Weight	3.3kg (7.26lb)
Packing List	Set of 7 mandrels (Elcometer 1500/1), Set of 13 mandrels (Elcometer 1500/2) and operating instructions

How to use a cylindrical mandrel bend tester

Insert large diameter mandrel followed by the coated test panel, making sure that the painted area faces away from the mandrel.

Tighten the vice by rotating the vice handle.

With a smooth action pull the lever around the mandrel. Check for damage.

Repeat as necessary with smaller diameter mandrels.

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Cylindrical Mandrel Bend Tester

The Elcometer 1506 is similar in use to the Elcometer 1510, being a very robust mechanical unit for determining the elasticity, adhesion and elongation properties of cured coatings on sheet metal.

The frame has a bending lever with height-adjustable rollers and a sliding vice for clamping the sample which means the test pieces are bent perfectly and regularly on decreasing mandrels until the desired effect can be observed.

The instrument can be adjusted to the diameter of the mandrel used as the mandrels are easily changed.

A wide range of metric and imperial mandrels are available. Mandrel sets or individual Mandrels should be ordered separately - please see accessories below.

STANDARDS:
AS/NZS 1580.402.1, ASTM D 522-B, ASTM D 1737, ISO 1519-2, JIS K 5600-5-1

Technical Specification

Part Number	Description
K1506M201	Elcometer 1506 Cylindrical Mandrel Bend Tester
Test Piece Width	Maximum: 64mm (2.5")
Test Piece Length	Maximum: 80 to 100mm (3.15 to 3.93") depending on the size of the Mandrel used
Dimensions	320 x 135 x 130mm (12.6 x 5.3 x 5.1")
Weight	4.3kg (9.5lb)
Packing List	Elcometer 1506 Cylindrical Mandrel Bend Tester and operating instructions

Accessories

KT001506P201	Elcometer 1506 Metric Mandrel Set, 2 to 32mm (one of each of the Metric Mandrels below)		
KTUS1506P201	Elcometer 1506 Imperial Mandrel Set, 1/8 to 1" (one of each of the Imperial Mandrels below)		
	Metric		**Imperial**
KT001506F002	2mm Mandrel	KTUS1506F022	1/8" Mandrel
KT001506F003	3mm Mandrel	KTUS1506F023	1/4" Mandrel
KT001506F004	4mm Mandrel	KTUS1506F024	3/8" Mandrel
KT001506F005	5mm Mandrel	KTUS1506F025	1/2" Mandrel
KT001506F006	6mm Mandrel	KTUS1506F026	5/8" Mandrel
KT001506F007	8mm Mandrel	KTUS1506F027	3/4" Mandrel
KT001506F014	10mm Mandrel	KTUS1506F028	1.0" Mandrel
KT001506F015	12mm Mandrel		
KT001506F016	13mm Mandrel		
KT001506F017	16mm Mandrel		
KT001506F018	19mm Mandrel		
KT001506F019	20mm Mandrel		
KT001506F020	25mm Mandrel		
KT001506F021	32mm Mandrel		

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Elcometer 1510

Conical Mandrel Bend Tester

The Elcometer 1510 Bend Tester is a mechanical tester used to determine the effects of bending on the elasticity, adhesion and elongation properties of cured coatings on sheet metal.

The frame has a bending lever with a roller which pivots on a steel conical mandrel with a diameter from 3.2 - 38.1mm (0.12 - 1.5"). A graduation indicates the mandrel diameter in both mm and inches.

The specimen can be bent on part of, or along, the entire length of the mandrel, and the results (cracks) corresponding to different test diameters can be observed in a single operation. This is ideal for use in conjunction with the cylindrical mandrel, as it identifies the stop point for more focused testing.

As the instrument is machined out of a solid block of steel, the particularly robust and rigid construction provides excellent resistance to wear and provides long service life. A large, sturdy anodised base, which can be permanently fixed to a workstation, ensures stability during testing.

STANDARDS:
ASTM D 522-A, BS 3900-E11, ISO 6860

Technical Specification   C

Part Number	Description	Certificate
K0001510M001	Elcometer 1510 Conical Mandrel Bend Tester	○
Diameter Range	3.2 - 38.1mm (0.1 x 1.5")	
Sample Size	180 x 100 x 0.8mm (7 x 4 x 0.03")	
Dimensions	325 x 350 x100mm (12.8 x 13.8 x 4")	
Weight	9kg (20lb)	
Packing List	Elcometer 1510 Conical Mandrel Bend Tester and operating instructions	

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0001510M001 is the certificate for model K0001510M001).

Cupping Tester

These robust and user-friendly instruments are used for assessing the cupping ability of coatings applied to metal sheets up to 1.2mm (0.05") thick.

The Elcometer 1620 has a 27mm (1.06") diameter hardened steel die in a clamping device and a 20mm (0.79") diameter punch. A hand-rotated crank and reduction drive moves the punch progressively into the sample.

The Elcometer 1620 has a digital gauge with an illuminated magnifier to accurately view the resultant damage and provides accurate readings of the cupping depth on an integrated gauge. Direct viewing of the fissures, cracks and tears in the coating of up to 10µm (0.4mil) can be viewed through the supplied x10 illuminated magnifying glass.

STANDARDS:

BS 3900 E4, DIN 53156, DIN 53232, ECCA T6, EN 13523-6, ISO 1520, JIS K 5600-5-2, NBN T22-104, NF T30-019

Technical Specification   C

Part Number	Description	Gauge Type	Certificate
K0001620M004	Elcometer 1620/4 Manual Cupping Tester	Digital (mm, mils)	○
Dimensions	300 x 240 x 500mm (12 x 10 x 20")		
Weight	24kg (53lb)		
Packing List	Elcometer 1620 Cupping Tester, gauge, gauge holder, zero setting sheet, illuminated 10x magnifying glass with magnet and operating instructions		

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number e.g. QCK0001620M002 is the certificate for model K0001620M002.

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Elcometer 1615   **Variable Impact Tester**

This simple to use gauge is ideal for evaluating the resistance of a coating to impact (elongation, cracking or peeling), and is suitable for use on both direct and indirect test methods.

Direct: either a weight with a hemispherical punch attached falls on a coated metal sheet.

Indirect: a weight falls on to a hemispherical punch which is resting on the coated metal sheet.

The Elcometer 1615 Impact Tester comes as one universal assembly with the option of six different kits providing the functionality for various testing methods.

The base unit is common to all tests. Simply select the appropriate kit to meet your requirements, from pages 88 - 89.

The test specimen is fixed into position by the quick release clamp. The weight is lifted to the predetermined height and can be set by the adjustable collar device. The weight is then released and the resulting deformation is observed.
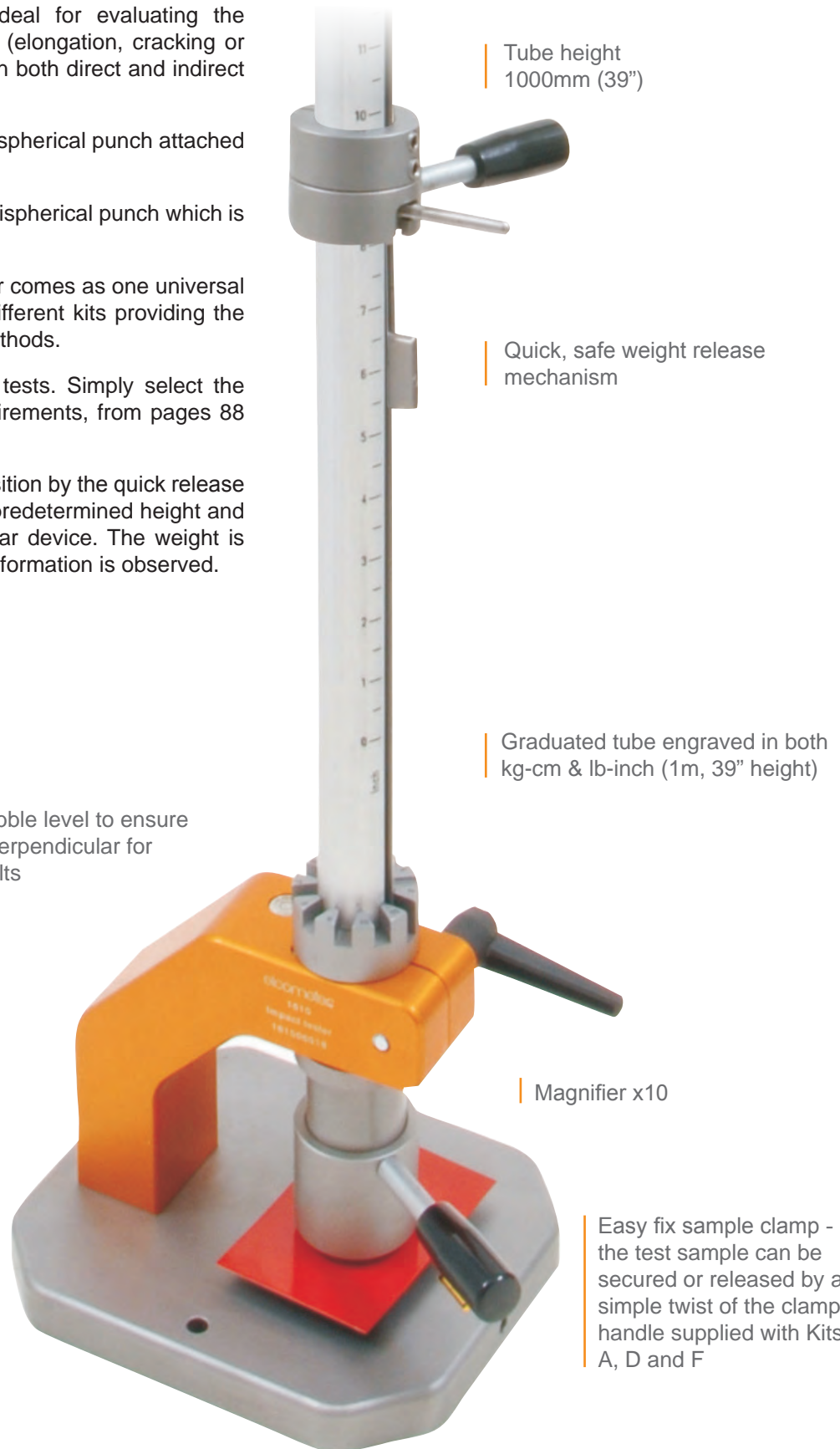
Tube height
1000mm (39")

Quick, safe weight release mechanism

Graduated tube engraved in both kg-cm & lb-inch (1m, 39" height)

Integrated bubble level to ensure the tester is perpendicular for accurate results

Stop collar with 10 settings between 2mm and 15mm (0.08 and 0.60") to change the depth of impact when working in accordance with ISO Standards, supplied with Kits A, D and F

Magnifier x10

Easy fix sample clamp - the test sample can be secured or released by a simple twist of the clamp handle supplied with Kits A, D and F

Heavy-duty, passivated base plate and anodised arm for long life

Variable Impact Tester

Variable Impact Tester Kits

The Elcometer 1615 Variable Impact Testers are designed to meet a wide range of National and International Standards. Simply select the appropriate kit from pages 88 - 89 and attach the punch, die and accessories to the base unit.

Interchangeable dies - enables the user to match the die to the size of the relevant punch to conform to the required Standard or method.

STANDARDS:

ASTM D 2794, ASTM D 5420,
AS/NZS 1580.406.1, BS 6496:1984,
BS 3900-E13, ECCA T5,
EN 12206-1:2004, EN 13523-5,
ISO 6272:1993, ISO 6272-1,
ISO 6272-2, JIS K 5600-5-3:1999,
NF T30-017:1989

Technical Specification

Part Number	Description
K0001615M201	Elcometer 1615 Impact Tester Universal Base Unit and Tube
Weight	10.6kg (23.34lb)
Dimensions	1460 x 200 x 165mm (57.5 x 8.0 x 6.5")
Packing List	Elcometer 1615 Impact Tester with passivated base, integrated bubble leveller, graduated tube, collar release mechanism and operating instructions

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Elcometer 1615 — Elcometer Impact Tester Kits

In order to test a sample in accordance with a specified standard, a number of kits have been created to provide a single Impact Tester which, by using the appropriate kit, allow the user to work in accordance with a wide range of National and International standards.

Kit A

Part Number	Description	Certificate
KT001615KITA	Elcometer Impact Tester Kit A	○

Packing List	• Falling 1kg (2.2lb) weight with a 20mm (0.79") punch
	• Stop collar
	    Values: 2, 3, 4, 5, 6, 7, 8, 9, 10 & 15mm (0.08, 0.12, 0.16,
	          0.20, 0.24, 0.28, 0.31, 0.35, 0.39 & 0.60")
	• 27mm (1.06") die with fixing screw
	• Sample clamp with two fixing screws
	• 3mm (0.12") and 4mm (0.15") hexagonal wrench	

STANDARDS:

ISO 6272:1993, EN 13523, JIS K 5600-5-3, DIN EN ISO 6272-1

Kit B

Part Number	Description	Certificate
KT001615KITB	Elcometer Impact Tester Kit B	○
Packing List	• Static indenter with 15.9mm (0.6") punch • Falling 1kg (2.2lb) weight • 12.7mm (0.5") punch • 16.3mm (0.64") die with fixing screw • 3mm (0.12") hexagonal wrench	

STANDARDS:

ASTM D 2794, BS EN ISO 6272-2, ISO 6272-2 :2002, Qualicoat

Kit C

Part Number	Description	Certificate
KT001615KITC	Elcometer Impact Tester Kit C	○
Packing List	• Static indenter with 15.9mm (0.6") punch • Falling 2lb (908g) weight • 16.3mm (0.64") die with fixing screw • 3mm (0.12") hexagonal wrench	

STANDARDS:

ASTM D 2794, BS6496:1984, EN 12206-1

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCKT001615KITC is the certificate for model KT001615KITC).

Kit D

Part Number	Description	Certificate
KT001615KITD	Elcometer Impact Tester Kit D	○
Packing List	• Falling 1kg (2.2lb) weight with 20mm (0.79") punch and stop key	
	• 27mm (1.06") die with fixing screw	
	• Stop collar	
	Values: 2, 3, 4, 5, 6, 7, 8, 9, 10 & 15mm (0.08, 0.12, 0.16, 0.20, 0.24, 0.28, 0.31, 0.35, 0.39 & 0.60")	
	• Sample clamp with fixing screws,	
	• 3mm (0.12") and 4mm (0.15") hexagonal wrench	
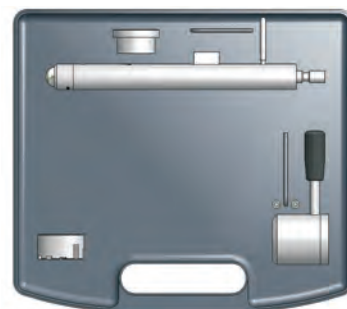
STANDARDS:
ISO 6272-1, BS EN ISO 6272-1, NF EN ISO 6272-1

Kit E

Part Number	Description	Certificate
KT001615KITE	Elcometer Impact Tester Kit E	○
Packing List	• Falling 400g (0.9lb) weight with 23mm (0.90") punch	
	• 22mm (0.87") die with fixing screw	
	• 3mm (0.12") hexagonal wrench	

STANDARDS:
NF T30-017:1989

Kit F

Part Number	Description	Certificate
KT001615KITF	Elcometer Impact Tester Kit F	○
Packing List	• Falling 1kg (2.2lb) weight with a 20mm (0.79") punch	
	• Stop collar	
	Values: 2, 3, 4, 5, 6, 7, 8, 9, 10 & 15mm (0.08, 0.12, 0.16, 0.20, 0.24, 0.28, 0.31, 0.35, 0.39 & 0.60")	
	• 27mm (1.06") die with fixing screw	
	• Sample clamp with two fixing screws	
	• 3mm (0.12") and 4mm (0.15") hexagonal wrench	
	• Static indenter with 15.9mm (0.6") punch	
	• Falling 1kg (2.2lb) weight	
	• 12.7mm (0.5") punch	
	• 16.3mm (0.64") die with fixing screw	
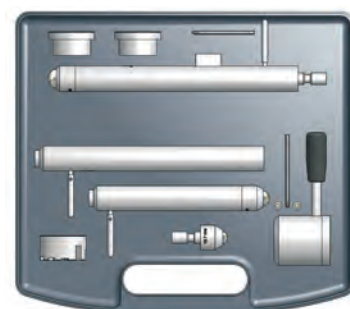
STANDARDS:
ASTM D 2794, BS EN ISO 6272, DIN EN ISO 6272-1, EN 13523-5, ISO 6272, Qualicoat 2006, SN EN ISO 6272-1

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCKT001615KITF is the certificate for model KT001615KITF).

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Elcometer 1615   Variable Impact Tester Accessories

The following range of accessories have been designed to help you evaluate the resistance of a coating to impact (elongation, cracking or peeling) when used in conjunction with the Elcometer 1615 Variable Impact tester.

Punches are universal and can be used either fitted to a falling weight or as a punch resting on the sample.

Accessories	
KT001615N201	Additional 1kg (2.2lb) Falling Weight, 24.6mm (0.97) Diameter
KT001615N221	Additional 1kg (2.2lb) Falling Weight, 25.0mm (0.98) Diameter
KT001615N215	12.7mm (0.5") Diameter Punch
KT001615N205	15.9mm (0.6") Diameter Punch
KT001615N206	20mm (0.79") Diameter Punch
KT001615N207	23mm (0.9") Diameter Punch
KT001615N208	Stop Ring Collar
KT001615N209	Sample Clamp Mechanism
KT001615N210	Weight Release Mechanism
KT001615N211	Replacement Graduated Tube
KT001615N212	16.3mm (0.64") Die
KT001615N213	22mm (0.87") Die
KT001615N214	27mm (1.06") Die

Appearance

Visual appearance can determine a person's perception of a product. Colour and Gloss are two key parameters that are used to define a product's overall quality. Perception is subjective, but Elcometer's range of instruments quantify the appearance criteria.

Gloss: The ability of a surface to reflect light without scattering is known as gloss. Gloss is measured by directing a constant intensity light beam at a fixed angle to the test surface and then by monitoring the amount of reflected light at the same angle. 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 a considerable difference in gloss yet give comparable readings when measured with a traditional glossmeter. These materials can be differentiated by measuring at a second angle and comparing the two readings using a haze meter. Reflectance haze is defined by ASTM D4039 as the difference between gloss at 60° and the gloss at 20°.

Shade: The measurement of darkness or lightness of a surface, 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 0° is measured on a grey scale, where black is 0% and white is 100%.

Opacity: The degree to which a coating hides the surface to which it has been applied is known as opacity. Measured in a similar way to shade, 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.

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

Rspec: Peak specular reflectance is a measure of the peak gloss value of a surface; this value is obtained very close to the specular angle.

Distinctiveness of Image (DOI): Measures the effect of surface textures such as orange peel on a reflected image. Reflections seen in a totally smooth high gloss surface are completely sharp and distinct. As surface textures increase the image becomes fuzzy and distorted.

elcometer®

Elcometer 408

Gloss & DOI Meters

The Elcometer 408 provides the very latest in gloss measurement technology, providing accurate gloss, haze and DOI analysis in a single reading.

STANDARDS:
AS/NZS 1580.602.2, ASTM C 584,
ASTM D 1455, ASTM D 2457,
ASTM D 4039, ASTM D 523,
ASTM D 5767, DIN 67530, ECCA T2,
EN 12373-11, EN 13523-2, ISO 2813,
ISO 7668, JIS K 5600-4-7, JIS Z 8741,
TAPPI T 653

new

Press button once to measure all parameters including gloss, haze, DOI, Rspec, DOI and Goniophotometric profiles

USB or Bluetooth® data output

Stores up to 999 readings with full goniophotometric profiles in user definable batches

Onboard statistics with trend & measurement graphs

Integrated calibration tile for fully automatic error free calibration

Easy to read large colour screen with adjustable brightness

Fast and simultaneous measurement of all parameters
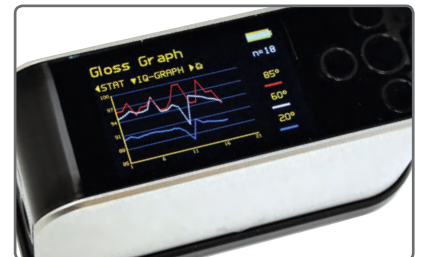
On screen graph highlights trends in the measured batch

elcometer

Gloss & DOI Meters **Elcometer 408**

Accurate

- Fast and simultaneous measurement of gloss, haze, DOI, Rspec, RIQ as well as Goniophotometric profiles

- Each instrument is supplied with a Calibration Certificate traceable to ISO 17025, UKAS & BAM

Simple

- Bright, easy to read LCD screen displays the gloss value, statistics & graphs - display measurements are user definable

- Each set of readings is time & date stamped

Flexible

- Dual (20/60°) or Triple (20/60/85°) angle versions for maximum accuracy and resolution in all gloss applications

- User definable display measurements

- Bluetooth® or USB download to ElcoMaster™ 2.0 data management software for instant analysis

Durable

- Robust aluminium construction ensures optical stablility

- 17hrs+ continuous operation or 20,000+ readings

- Pocket sized instrument with integrated tile holder

Efficient

- Easy menu-driven user interface in multiple languages

- Clear, illuminated display showing up to five parameters

- On board trend analysis with gloss and image quality (IQ) values

Powerful

- On board memory for 999 readings with full goniophotometric profiles

- Measures up to 20,000 readings on a single charge - fully rechargeable in 2.5 hours

new

Paperless Quality Assurance with the ElcoMaster™ suite of products

supplied with
ElcoMaster™ 2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 94

elcometer®

Elcometer 408 — Gloss & DOI Meter

Product Features

	Elcometer 408
Easy to use menu structure	English, Spanish, French, Italian, German, Chinese
Bright colour screen; *with permanent back light*	Adjustable brightness, 6 button touch sensitive interface
User definable measurement display	■
Scratch & solvent resistant display	■
Mains or USB power supply	■
Calibration certificate: *ISO, UKAS & BAM traceable*	■
Data output	■
USB; *to PC*	■
Bluetooth®: *to PC or Android™ mobile device*	■
On screen statistics	$\overline{x}$, σ, maximum & minimum value
ElcoMaster™ 2.0 software & USB cable	■
Date and time stamp	■
Gauge memory; *number of readings*	up to 999 readings & curves
Repeat measurement mode	user definable: 2, 5 or 10 seconds
Delete last reading	■
Standard & fixed batch sizes	■
Trend, gloss & image graphs	■
Measurement modes	Gloss (GU): 20°, 60°, 85°*; Haze (HU) & Haze Log (HU Log); Distinctiveness of Image (DOI); Peak Reflectance (Rspec); Reflected Image Quality (RIQ) & Goniophotometric Profile

new

Technical Specification   C

Part Number	Description	Certificate
J408--26	Elcometer 408 Dual Angle Gloss & DOI Meter (20 & 60 Degree)	●
J408--268	Elcometer 408 Triple Angle Gloss & DOI Meter (20, 60 & 85 Degree)	
Power Supply	Rechargeable Lithuim Ion gives 17+ hours / 20,000 readings	
Recharge Time	USB 4.5 hours, Mains Charger 2.5 hours	

	Gloss	Haze	DOI	RIQ	Goniophotometric
Measurement Range	20°: 0-2,000GU; 60°: 0-1,000GU; 85°: 0-150GU	0-2,000GU	0-100 DOI	0-100 RIQ	-
Resolution	0.1GU	0.1HU	0.1		0.1GU
Repeatability	0.2GU	0.2HU	0.2		0.2GU
Reproduceability	0.5GU	0.5HU	0.5		0.5GU
Peak Specular Reflectance	-20° ± 0.09375°				
Dimensions (H x W x D)	65 x 140 x 50mm (2.5 x 5.5 x 1.9")	Weight	790g (1lb 12oz)		
Packing List	Elcometer 408 Gloss & DOI Meter, ISO 17025 high gloss calibration tile with calibration certificate, gloss tile cleaning cloth, mains charger (UK, EU & US), transit case, USB cable, ElcoMaster™ 2.0 software and operating instructions.				

Accessories

T40823532	ISO 17025 High Gloss Calibration Tile with Calibration Certificate
T40823533	Mirror Gloss Calibration Tile with Calibration Certificate
T99923535	Gloss Tile Cleaning Cloth
T99921325	USB Cable

● Certificate supplied as standard.

* Elcometer 408 Triple Angle Gloss & DOI Meters

Gloss & DOI Meter Definitions

Gloss (GU)
A simple measurement proportional to the amount of light reflected from a surface determining how shiny a surface appears.
Surface texture can reduce appearance quality, without affecting gloss. These two test panels have identical readings when measured with a standard glossmeter.

Haze (HU) & Log Haze (HULog)
High quality gloss surfaces have a clear, deep, brilliant finish. Haze causes a drop in reflected contrast and causes halos to appear around light sources, these unwanted effects dramatically reduce visual quality.

Undetectable by traditional gloss meters the Elcometer 408 measures Haze Units in accordance with ASTM E410 at the same time as simultaneously measuring gloss and DOI.

Peak Reflectance (Rspec)
Rspec is the peak reflectance measured over a very narrow angle in the specular direction and is very sensitive to any surface texture, waviness or rippling. When Rspec is equal to the gloss the surface is smooth. Rspec drops as the surface texture increases.

Distinctness of Image (DOI)
Distinctness of Image measures the sharpness of a reflected image in a coating surface. Similar coatings may have identical gloss values but visually the quality may be very different. A visually poor coating may have a highly textured dimpled appearance known as "orange peel". When a reflected object is viewed in such a coating the image becomes fuzzy and distorted.

A surface that has a perfect undisorted images returns a value of 100. As the value decreases the image becomes more distorted.

Reflected Image Quality (RIQ)
Reflected Image Quality provides greater sensitivity when evaluating highly reflective coatings and the specular / diffuse element of lower gloss materials.
A surface that exhibits a perfect undistorted image returns a value of 100, as the values decrease higher surface texture is present and the image sharpness reduced.

Goniophotometric Profile
The gloss, haze, DOI and Rspec values produced by the Elcometer 408 can be used to assess the visual quality of any surface. The full range of goniophotometric curves can be downloaded to a computer for detailed understanding of specular reflectance. The Elcometer 408 not only measures gloss but can also be used to quantify the orange peel finish or a substandard coating with a low DOI.

Gloss (GU)
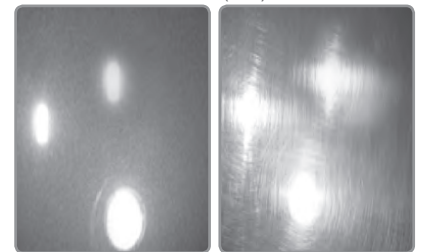
Haze (HU) & Haze Log (HULog)
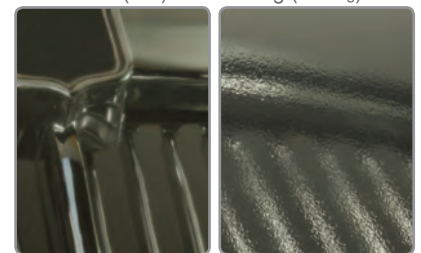
Peak Reflectance (Rspec)
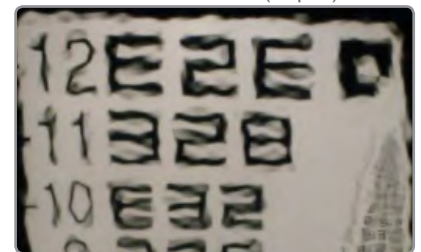
Distinctiveness of Image (DOI)

Reflected Image Quality (RIQ)

Goniophotometric Profile

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Elcometer 406L

Statistical Glossmeter

The low cost Elcometer 406L Statistical Mini Glossmeter is available in 60° and dual angle 20°/60° to measure any surface from high gloss to matt, providing a quantitative value to gloss measurement.

- Single (60°) and Dual angle (20°/60°) readings
- Gloss readings from matt (non-reflective surfaces) to mirror finish
- Continuous measurements for variable surfaces
- 200 reading memory
- Unique calibration tile condition warning
- Quick, automatic calibration
- Menu driven operation in multiple languages
- LED light source is long lasting and stable
- Full traceability to National Standards, including BAM

STANDARDS:
AS/NZS 1580.602.2, ASTM C 584, ASTM D 1455, ASTM D 2457, ASTM D 4039, ASTM D 523, DIN 67530, ECCA T2, EN 12373-11, EN 13523-2, ISO 2813, ISO 7668, JIS K 5600-4-7, JIS Z 8741, TAPPI T 653

Technical Specification   C

Part Number	Description	Certificate
J406L--60S	Elcometer 406L 60° Statistical Mini Glossmeter	●
J406L--2060S	Elcometer 406L Dual 20/60° Statistical Mini Glossmeter	●
Accuracy	Reproducibility ±0.5 Gloss Units (GU)	
Measurement Resolution	0.1GU	
Dimensions	125 x 50 x 100mm (4.9 x 2.0 x 3.9")	
Weight	350g (12.3oz)	
Power Supply	5 x LR03 (AAA)	
Measurement Range	0 - 1,000 GU for 60° 0 - 2,000 GU for 20°	
Memory	200 readings per angle	
Packing List	Elcometer 406L Statistical Mini Glossmeter, 5 x LR03 (AAA) alkaline batteries, screwdriver, certified calibration tile, cleaning cloth for tile, calibration certificate for tile, CD-ROM containing Novo-Soft™ software package, USB cable, carry case and operating instructions	

Accessories

T99918533	60° Gloss Standard Calibration Tile with Calibration Certificate	
T99918534	20°/60° Gloss Standard Calibration Tile with Calibration Certificate	
T99920213	USB Cable	

● Certificate supplied as standard.

Novo-Curve™ Glossmeter for Curved Surfaces

Elcometer 400

Developed in collaboration with the UK's National Physical Laboratory (NPL), the Elcometer 400 glossmeter's small measurement area and unique sample positioning system ensures that components can be accurately positioned, making this glossmeter the ideal unit for taking measurements on small, curved or complex surfaces.

The Elcometer 400 glossmeter's 2 x 2mm (0.08 x 0.08") measurement area is approximately 3% of the area usually required by standard glossmeters.

Features:

- Continuous reading mode
- Statistical analysis
- Internal Memory - up to 199 readings can be stored in the gauge
- USB Data Output to PC
- Auto ranging geometry - readings can be taken from matt to mirror finish

STANDARDS:
ASTMD523

Technical Specification		C
Part Number	Description	Certificate
J400----1	Elcometer 400 Novo-Curve™ Glossmeter	●
Geometry	60° with auto-ranging - for measurement over the entire Gloss Range - matt to mirror	
Dimensions & Weight	260 x 220 x 100mm (10 x 8.5 x 4.5"); 2.5kg (5.5lb)	
Memory	199 readings	
Power Supply	110-120V AC or 220-240V AC	
Measurement Area	2 x 2mm (0.08 x 0.08")	
Packing List	Elcometer 400, black gloss (high gloss) and black foam (zero) calibration standards, calibration certificate for standards, foot operated switch, four removable support posts, Novo-Soft™ software, USB cable, UK, EUR & US power leads and operating instructions	

Accessories	
T40019998	Cylinder Measurement Placement Jig

● Certificate supplied as standard.

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Elcometer 6014

Shade & Opacity Meter

The Elcometer 6014 Shade & Opacity Meter is a low-cost dual function reflectometer for measuring shade and opacity using 45°/0° geometry.

This 2-in-1 gauge is the perfect choice for any industry that needs to measure the shade and opacity of its products.

Features:

- Accurately calculates opacity using up to six values over black and white for accurate readings
- Statistical analysis for up to 25 batches provides instant indication of batch quality
- Readings can be stored on the gauge and downloaded to a PC to utilise the supplied software
- Continuous read feature, ideal for quickly checking large surfaces
- Use in conjunction with opacity charts for repeatable testing

STANDARDS:
AS 1580.213.2, AS/NZS 1580.213.2, ASTM D 2745, ASTM D 2805, ASTM D 6441, BS 3900-D4, DIN 53146, DIN 55984, ISO 2814, ISO 6504-3, JIS K 5600-4-1

Technical Specification   C

Part Number	Description	Certificate
K0006014M001	Elcometer 6014 Shade & Opacity Meter	•
Measurement Units	Shade: 0% (black) to 100% (white)	
	Opacity: 0% (transparent) to 100% (opaque) relative to 5% white & 75-85% black	
Resolution	0.1% Repeatability: 0.2% Reproducibility: 0.5%	
Operating Temperature	0°C to 50°C (32°F to 120°F)	
Measurement Area	15 x 10mm (0.59 x 0.39") ellipse	
Weight	470g (16.5oz)	
Battery	Dry batteries: 4 x LR6 (AA); 3000 readings	
Packing List	Elcometer 6014 Shade & Opacity Meter, 4 x LR6 (AA) alkaline batteries, screwdriver, calibration tile with protective box and cleaning cloth, calibration certificate for tile, Novo-Soft™ software on CD, USB cable, carry case and operating instructions	

Accessories

Part Number	Description	Box Weight	Quantity per Box
KT006014P001	Certified Calibration Standard		
T99920213	USB Cable		
K0004695M003	Box of Leneta Chart 2A - 140 x 254mm (5 1/2 x 10")*	2.72kg (6lb)	250
K0004695M004	Box of Leneta Chart 2C - 194 x 260mm (7 5/8 x 10 1/4")*	4.08kg (9lb)	250
K0004695M006	Box of Leneta Chart 3B - 194 x 289mm (7 5/8 x 11 3/8)*	4.08kg (9lb)	250
K0004695M015	Box of Leneta Chart 5C - 194 x 260mm (7 5/8 x 10 1/4)*	4.08kg (9lb)	250
K0004695M036	Box of Leneta Chart 14H - 286 x 738mm (11 1/4 x 17 1/4)*	5kg (11lb)	125

Chart 2A   Chart 2C   Chart 3B   Chart 5C   Chart 14H

• Certificate supplied as standard.

Elcometer Novo-Soft™ Software

This easy to use software provides users with a means to download readings from all Elcometer gloss, haze and opacity meters for data storage, analysis and reporting.

Supplied free of charge with the Elcometer 400, 406L, 407 and 6014 gauges, Elcometer Novo-Soft™ allows users to:

- Save readings for your internal records
- Add notes against individual readings
- Graphically analyse your measurement data
- Exclude erroneous readings from your statistical analysis
- Compare individual batches of data, graphically
- Compare results from different angles of geometry
- Combine separate batches for group statistical analysis
- Export data in different file formats (.xls, .csv, etc)
- Change user preferences including language, calibration options, etc. on the Elcometer 406L and Elcometer 6014 gauges

Choosing the angle for Gloss Measurement

All light sources reflect from a surface, the degree of the amount of light reflected is known as the surface gloss value.

Gloss value is measured in Gloss Units (GU) relative to a Standard of approximately 100 GU. Gloss can be categorised into 3 general ranges, low, semi and high.

Each of these are best measured at their own unique respective angles.

To determine the most appropriate angle at which to measure, starting at 60° gives a good indication. If the result lies within 10 - 70 GU, the coating is termed semi-gloss and is best measurable at this angle. If the result is less than 10GU, the product is low gloss and should be measured at 85° and finally, if the result lies above 70GU, the product is high gloss and is best measured at 20°.

All angles are taken from the perpendicular, as shown above.
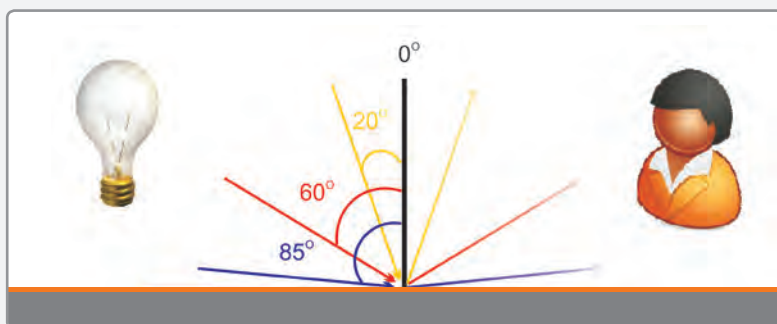
elcometer®

Elcometer 6075   SP60 Portable Sphere Spectrophotometer

The Elcometer 6075/1 SP60 is an affordable sphere spectrophotometer, designed to give fast, precise and accurate colour measurement information on materials ranging from paper and paint to plastics and textiles.

- Lightweight, compact, portable instrument
- Diffuse/8° sphere optical geometry
- Fixed 8mm aperture
- Large, easy-to-read graphical LCD display
- Opacity and colour strength measurement
- Simultaneous measurement of both specular component included and specular component excluded
- Rugged construction
- Rechargeable battery for remote use

STANDARDS:

AS/NZS 1580.601.3, ASTM C 609, ASTM D 2244, ASTM E 1164, ASTM E 308, ASTM E 313, BS 8493, DIN 5033-2, DIN 5033-3, DIN 5033-4, DIN 5033-7, DIN 6174, EN 12373-12, EN 13523-15, ISO 7724-2, ISO 7724-3, JIS K 5600-4-5, JIS K 5600-4-6, NF T36-006, NF X08-012-1, NF X08-012-2

Key Features

- **Measuring Functions and Indices**
  The Elcometer SP60 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: L*a*b*, DL*Da*Db*, L *C*h°, DL*DC*DH*, DE*ab, DECMC, DE CIE94 and XYZ. Whiteness and Yellowness per ASTM E 313-98.

- **Pass/Fail Mode**
  The instrument stores up to 1024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

- **Quick Colour Compare**
  A quick measurement can be taken to compare two colours. This allows the operator to take quality control readings in a time efficient manner without having to create tolerances or store data.

- **The Sphere**
  The Elcometer SP60's diffusing sphere is made of Spectalon®, a durable, highly reflective material designed to perform in a rigorous production environment. The diffusing material prevents degradation due to the flaking and chipping of the sphere wall material.

- **Opacity, Colour Strength and Shade Sorting**
  The instrument can measure opacity as well as three colour-strength options: chromatic, apparent and tri-stimulus calculations. The Elcometer SP60 also performs 555 shade sorting. This is an important consideration in the colour quality control of manufactured products involving plastics, painted or textile materials.

- **Texture and Gloss influence**
  To determine the influence of the specular component, the SP60 allows simultaneous measurement of both specular - included (colour) and specular-excluded (appearance)

- **User friendly Ergonomics**
  In addition to on-board programmes to assist the operator in the measurement process, the instrument itself is highly user-friendly. It is compact and lightweight with a wrist strap and the tactile side grips make it easy to hold. Read-outs are large and easy to see. A rechargeable battery pack allows extended operation of the instrument.

elcometer®

SP60 Portable Sphere Spectrophotometer　　　　　**Elcometer 6075**

Technical Specification　　　　　　　　　　　　　　　　　　　　　　　　C

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		●
K0UK6075M001	K0006075M00	K0US6075M001	SP60 Portable Sphere Spectrophotometer 8mm Fixed Aperture	
Measuring Geometrics	d/8°, DRS spectral engine, fixed aperture: 8mm viewing/12mm illumination			
Light Source	Gas filled tungsten lamp			
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11, F12			
Standard Observers	2° and 10°			
Spectral Range	400-700nm			
Memory	1,024 standards with tolerances, 2,000 samples			
Measurement Range	0 to 200% reflectance			
Measuring Time	Approximately 2 seconds			
Inter-Instrument Agreement	CIE L*a*b*: Average 0.40 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.60 ΔE*ab on any tile (specular component included) CMC Equivalent: Average 0.30 ΔEcmc based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.50 ΔEcmc on any tile (specular component included)			
Short-term Repeatability†	0.10 ΔE*ab on white ceramic (standard deviation)			
Lamp Life	Approximately 500,000 measurements			
Power Supply	Removable (Ni-metal hydride) battery pack; 7.2 DC rated @1450mAh			
Measurements per Charge	1,000 measurements within 8 hour period			
Weight	1.1kg (2.4lb)			
Dimensions	109 x 83 x 195mm (4.3 x 3.3 x 7.7")			
Packing List	Elcometer 6075/1, calibration standards, calibration certificate for standards, AC adaptor, carry case & operating instructions			

Accessories

UK 240V	EUR 220V	US 110V	Description
KTUK6075P001	KT006075P001	KTUS6075P001	Battery Charger Kit
KT006075P002	KT006075P002	KT006075P002	NiMH Battery Pack

● Certificate supplied as standard.　　　　　　　　　　　　　　†Based on 20 measurements on a white tile

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Elcometer 6300

Colour Assessment Cabinets

Colour assessment cabinets are suitable for any industry where there is a need to maintain colour consistency and quality. These include paint, textiles, automotive, ceramics, cosmetics, dyeing, food, footwear, inks, knitwear, packaging, printing, etc.

The Elcometer 6300 range of colour assessment cabinets, also known as light cabinets or colour matching booths, ensures accurate visual colour assessment and colour comparison. Constructed from steel, Elcometer's lightweight colour assessment cabinets are supplied with different light sources used to simulate different conditions.

Light sources available:
- Artificial Daylight (D65)
- Point of Sale Illuminant (TL84 supplied with UK 240V/EUR 220V models, CWF supplied with US 110V models)
- Home Illuminant (Illuminant A)
- Ultraviolet Illuminant (UV)
- Alternative Point of Sale Illuminant (TL83 emits a reddish, yellow energy)

The Elcometer 6300 Colour Assessment Cabinets also enable easy detection of metamerism. Metamerism is commonly discussed in the terms of illuminants, where two samples appear the same (spectrally matched) under one illuminant, but not another. For example, two car door panels appear the same colour in daylight, but, under a streetlight at night, appear completely different colours.

There is a choice of 3, 4 or 5 light sources with the Elcometer 6300 range. Cabinets are either available with manual light source selection or digital light source selection. The digital cabinets are able to programme the sequence of lights and the duration of each illumination. The lamp timer function, which is standard on all digital cabinets and as an option on manual cabinets, measures the number of hours the D65 daylight bulb has been in operation.

Colour Assessment Cabinet Overview

Model	Light Sources					Weight	Control
	D65	TL84/CWF	Illuminant A	UV	TL83		
Elcometer 6300 MM-1E	▪	▪	▪			14kg (30lb)	Manual
Elcometer 6300 MM-2E	▪	▪	▪			10kg (22lb)	Manual
Elcometer 6300 MM-4E	▪	▪	▪	▪	▪	17kg (38lb)	Digital
Elcometer 6300 MM-1E UV/65	▪	▪	▪	▪		14kg (30lb)	Manual
Elcometer 6300 MM-2E UV/65	▪	▪	▪	▪		10kg (22lb)	Manual

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Colour Assessment Cabinets

Elcometer 6300

The Elcometer 6300 range is available with a choice of 3, 4 or 5 light source cabinets, in a range of sizes and functionality to suit your particular requirements. Lamp Kits are available for each Colour Assessment Cabinet.

STANDARDS:
AS/NZS 1580.601.1, ASTM D1729, ASTM D 4086, BS-950-1, ISO 3668, JIS K 5600-4-3, SAE J361, TAPPI T 515

Colour Assessment Cabinet Dimensions

Part Number			Model	Dimensions	Light Source
UK 240V	EUR 220V	US 110V			
KTUK6300P002	K0006300M002	K0US6300M002	Elcometer 6300 MM-1E	483 x 660 x 432mm (19 x 26 x 17")	3
KTUK6300P001	K0006300M001	K0US6300M001	Elcometer 6300 MM-2E	457 x 520 x 330mm (18 x 20 x 13")	3
KTUK6300P003	K0006300M003	K0US6300M003	Elcometer 6300 MM-4E	483 x 685 x 483mm (19 x 27 x 19")	5
KTUK6300P202	K0006300M202	K0US6300M202	Elcometer 6300 MM-1E UV/65	483 x 660 x 432mm (19 x 26 x 17")	4
KTUK6300P201	K0006300M201	K0US6300M201	Elcometer 6300 MM-2E UV/65	457 x 520 x 330mm (18 x 20 x 13")	4
Packing List	Elcometer 6300 Light source, viewing surface, side walls, rear wall, power cable, assembly instructions, maintenance and operating instructions.				

Accessories

Part Number			Description
UK 240V	EUR 220V	US 110V	
KTUK6300P002	K0006300M002	K0US6300M002	Elcometer 6300 MM-1E Lamp Kit D65, TL84 & Illuminant A
KTUK6300P001	K0006300M001	K0US6300M001	Elcometer 6300 MM-2E Lamp Kit D65, TL84 & Illuminant A
KTUK6300P003	K0006300M003	K0US6300M003	Elcometer 6300 MM-4E Lamp Kit D65, TL84, Illuminant A, UV & TL83
KTUK6300P202	K0006300M202	K0US6300M202	Elcometer 6300 MM-1E UV/65 Lamp Kit D65, TL84, Illuminant A & UV
KTUK6300P201	K0006300M201	K0US6300M201	Elcometer 6300 MM-2E UV/65 Lamp Kit D65, TL84, Illuminant A & UV
Packing List	Elcometer 6300 Light source, viewing surface, side walls, rear wall, power cable, assembly instructions, maintenance and operating instructions.		

Light Source Key

D65	Artificial Daylight
TL84	Point of Sale Illuminant (supplied with UK 240V & EUR 220V units)
CWF	Point of Sale Illuminant (supplied with US 110V units)
TL83	Alternative Point of Sale Illuminant
Illuminant A	Home Illuminant
UV	Ultraviolet Illuminant

elcometer

Elcometer 6210

RAL Colour Charts

A system of reference colours, enabling many industrial products to be identified, compared and classified, ideal for use with Elcometer 6300 Colour Assessment Cabinets, (see pages 102 - 103).

Available either in the form of compact colour charts or in separate sheets of different sizes, with or without colourmetric identification, separately or in groups supplied in a file or a box.

Elcometer 6210 RAL Chart K1

High gloss colour chart, 16 colours per page, each with a 1.8 x 2.8 cm colour illustration.

Part Number: K0006210M013

Elcometer 6210 RALChart K5

Fan deck with RAL Classic colours, complete with U-shaped protective cover. Each colour has a full page 5.0 x 15.0 cm, perfect for colour combination and colour comparison.

Part Number: K0006210M001

Elcometer 6210 RALChart 841-GL

Box set of high gloss finish RAL Classic colour A5 card set featuring A6 colour illustrations.

Part Number: K0006210M015

Elcometer 6210 RAL Chart K7

Fan deck with RAL Classic colours, complete with U-shaped protective cover. Features 5 colours per page, with each colour swatch measuring 2.0 x 5.0 cm.

Part Number: K0006210M015

Elcometer 6210 RAL Chart 840-HR

Box set of matt finish RAL Classic colour A5 card set featuring A6 colour illustrations.

Part Number: K0006210M009

Material Thickness

Ultrasonic thickness gauges are used to accurately determine the thickness of a variety of materials when only one side is accessible ideal for monitoring corrosion and erosion.

Converting the time of flight of a pulse of sound energy, sent into and reflecting back from a defect or opposite surface, ultrasonic thickness gauges are ideal for not only measuring a material's thickness, but also detecting pits and flaws in a material without damage.

A coated surface may disguise defects in the substrate beneath; the wall thickness of a pipeline, for example, may have been eroded by the flow of the material inside.

Likewise the walls of a storage tank may appear acceptable on the outside but be dangerously thin inside due to the corrosive chemicals stored within.

From a steel thickness gauge to a gauge which ignores the thickness of the coating, Elcometer has a range of ultrasonic material thickness gauges to meet your specific requirements.

Definitions:

Scan Mode: Measuring up to 16 readings per second, the gauge captures the minimum recorded thickness

Alarm Mode: Once a minimum acceptable thickness has been set, a red LED illuminates and a buzzer sounds if a measurement falls below the preset value

Differential Mode: Set an acceptable thickness (nominal) value in the gauge and the unit will display the positive or negative (±) difference from the nominal value entered

Pulse Echo (PE): The standard method for measuring material thicknesses from 1.65mm to 25.4mm (0.065 to 1.00")

Interface Echo (IE): More accurate than the PE mode, IE displays the total thickness from the top surface to the material density boundary - i.e. ignores the couplant thickness.

Echo-to-Echo (Thru Paint) Mode (EE): Measuring materials as thin as 0.15mm (0.006") the Echo-to-Echo mode ignores the thickness of any coating applied to the surface under inspection

PLAS Mode: A mode specifically used for measuring very thin plastics. A special graphite delay line accessory is required for this mode

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Elcometer 204

Steel Thickness Gauge

Pre-calibrated for ease of use, the Elcometer 204 Steel Ultrasonic Thickness Gauge provides a fast, accurate measurement of the thickness of steel.

Each gauge is supplied with an integrated steel "zero" plate to ensure the greatest accuracy. Supplied with a transducer & ultrasonic couplant, simply switch on the gauge and take readings. The inbuilt backlight allows measurements in low light conditions.

- Supplied with everything required for use
- Low cost and easy to use
- Measure material thickness when there is access to only one side

STANDARDS:
ASTM E 797, EN 15317

PE
Mode

Technical Specification   C

Part Number	Description	Certificate
C204----1	Elcometer 204 Steel Ultrasonic Thickness Gauge	●
Range	0.63mm to 199.99mm or 0.025" to 19.999" (switchable)	
Resolution	0.01mm (0.001")	
Accuracy	±2% of reading or ±0.5mm (0.02"), depending on material and conditions	
Weight	295g (10oz) including batteries Dimensions 63 x 120 x 31mm (2.5 x 4.5 x 1.24")	
Operating Temperature	-30°C to 50°C (-20°F to 120°F) depending on climatic conditions	
Case	Extruded aluminium body, nickle plated aluminium end caps	
Battery Life	200 hours continuous use (alkaline dry batteries)	
Battery Type	2 x LR6 (AA), alkaline dry batteries	
Packing List	Elcometer 204 Steel Ultrasonic Gauge, transducer, calibration certificate, ultrasonic couplant, 2 x batteries, carry case and operating instructions	

Accessories

T92015646	Transducer: Potted Right Angle 5.0MHz, 6.4mm (¼") Transducer
T92015701	Ultrasonic Couplant - 120ml (4fl oz) Bottle
T92015874	High Temperature Ultrasonic Couplant - 60ml (2fl oz) Bottle
T92015617	Instrument Carry Case
T9205243-	Test Wedge: 2 - 25mm (0.07 - 0.98") in 6 Steps
T9205270-	Test Wedge: 30 - 100mm (1.18 - 3.93") in 8 Steps

● Calibration Certificate supplied as standard.

elcometer®

Basic Ultrasonic Thickness Gauge

Elcometer 205

The Elcometer 205 is a robust, hand-held ultrasonic thickness gauge that allows you to make reliable measurements or scan a length of material for defects, for the thinnest point.

The gauge features 3 calibration options: single point, 2 point and speed of sound selection - allowing accurate measurements on a wide range of materials.

Compatible with a wide range of measurement transducers, the Elcometer 205 features a backlight for measuring in darkened environments. Transducers are supplied separately, see pages 111 - 112.

STANDARDS:
ASTM E 797, EN 15317

supplied with
ElcoMaster™2.0
data management software
see page 264

PE
Mode

Technical Specification   C

Model	Elcometer 205	Certificate
Part Number	C205----1	●
Scan Mode	■	
Maximum Measurement Range	0.63 - 500mm (0.025 - 20") dependent on transducer and material	
Velocity Range	1250 - 10000m/s (0.0492 - 0.3930 in/µs)	
Accuracy	±0.1mm (0.004") dependent on material and conditions	
Resolution	0.01mm (0.001")	
Units	Millimetres and Inches	
Operating Temperature	-30°C to 50°C (-20°F to 120°F)	
Keypad Type	Sealed Membrane	
Display	114mm (4½") Digit Liquid Crystal Display with backlight	
Transducer	Select from transducer options on pages 111 - 112	
Battery Type (Life)	AA 1.5V Alkaline (200 hours)	
Weight	295g (10oz) including batteries Dimensions 63 x 120 x 31mm (2.5 x 4.75 x 1.25")	
Packing List	Elcometer 205 gauge, bottle of couplant, 2 x batteries, carry case, calibration certificate and operating instructions.	

Accessories

T92015701	Ultrasonic Couplant 120ml (4fl oz) Bottle
T92015874	High Temperature Ultrasonic Couplant 60ml (2fl oz) Bottle
T9205243-	Test Wedge: 2 - 25mm (0.07 - 0.98") in 6 Steps
T9205270-	Test Wedge: 30 - 100mm (1.18 - 3.93") in 8 Steps

● Calibration Certificate supplied as standard.

elcometer®

Elcometer 206 & 206DL

Ultrasonic Thickness Gauge

The Elcometer 206 & 206DL are hand-held ultrasonic thickness gauges that allow you to make reliable measurements or scan a length of material for defects, or for the thinnest point.

Each gauge comes with 3 calibration options: single point, 2 point and speed of sound selection - allowing accurate measurements on a wide range of materials. Compatible with a wide range of measurement transducers, these ultrasonic thickness gauges are available with or without memory and all come with a backlight for measuring in darkened environments. Transducers are supplied separately, see pages 111 - 112

STANDARDS:
ASTM E 797, EN 15317

PE
Mode

supplied with
ElcoMaster™2.0
data management software
see page 264

Technical Specification   C

Model	Elcometer 206	Elcometer 206DL
Part Number	C206----1	C206DL----1
Scan & Differential Modes	■	■
Alarm Mode	■	■
Data Output (Immediate)	■	■
Data Logging		1000 readings
ElcoMaster™ 2.0 Software		■
Certificate	●	●
Maximum Measurement Range	0.63 - 500mm (0.025 - 20") dependent on transducer and material	
Velocity Range	1250 - 10000m/s (0.0492 - 0.3930 in/µs)	
Accuracy & Resolution	Accuracy[1]: ±0.1mm (0.004"); Resolution: 0.01mm (0.001")	
Units	Millimetres and Inches	
Operating Temperature	-30°C to 50°C (-20°F to 120°F)	
Keypad Type	Sealed Membrane	
Display	114mm (4½") Digit Liquid Crystal Display with backlight	
Transducer	Select from transducer options on pages 111 - 112	
Battery Type (Life)	AA 1.5V Alkaline (200 hours)	
Weight	295g (10oz) Dimensions 63 x 120 x 31mm (2.5 x 4.75 x 1.25")	
Packing List	Elcometer 206 or 206DL gauge, bottle of couplant, 2 x batteries, carry case, calibration certificate and operating instructions. Elcometer 206DL: CD with ElcoMaster™ 2.0 software and data transfer cable	

Accessories

T92015701	Ultrasonic Couplant 120ml (4fl oz) Bottle
T92015874	High Temperature Ultrasonic Couplant 60ml (2fl oz) Bottle
T9205243-	Test Wedge: 2 - 25mm (0.07 - 0.98") in 6 Steps
T9205270-	Test Wedge: 30 - 100mm (1.18 - 3.93") in 8 Steps

● Calibration Certificate supplied as standard.

[1] Dependent on material and conditions

elcometer®

Ultrasonic ThruPaint™ Thickness Gauge

Rugged & repeatable hand-held gauges designed to non destructively measure the thickness of metal substrates whilst ignoring the thickness of up to 2mm (80mils) of an applied coating (Echo to Echo mode).

Supplied with or without data logging, each gauge can be used with a wide range of measurement transducers and has a wide range of functions including Scan mode and Alarm mode. Transducers are supplied separately, see pages 111 - 112.

STANDARDS:
ASTM E 797, EN 15317

supplied with
ElcoMaster™2.0
data management software
see page 264

| PE Mode | EE Mode |

Technical Specification — C

Part Number	C208----1	C208DL----1
Model	Elcometer 208	Elcometer 208DL
Scan Mode	■	■
Alarm Mode	■	■
Data Output (immediate)	■	■
Data Logging (memory)		1000 readings
ElcoMaster™ 2.0 Software		■
Certificate	●	●
Maximum Measurement Range	0.63 - 500mm (0.025 - 20"); 2.54 - 25.4mm (0.1 to 1.0") in Echo-to-Echo Mode	
Velocity Range	1250 - 10000m/s (0.0492 - 0.3937 in/µs)	
Accuracy & Resolution	Accuracy[1]: ±0.1mm (0.004"); Resolution: 0.01mm (0.001")	
Units	Millimetres and Inches	
Operating Temperature	-20°C to 50°C (-4°F to 120°F)	
Keypad Type	Sealed Membrane	
Display	114mm (4½") Digit Liquid Crystal Display with backlight	
Battery Type (Life)	2 x LR6 (AA) 1.5V Alkaline (200 hours)	
Weight	295g (10oz) Dimensions 63 x 120 x 31mm (2.5 x 4.75 x 1.25")	
Packing List	Elcometer 208 or 208DL gauge, bottle of couplant, 2x batteries, carry case, calibration certificate and operating instructions. Elcometer 208DL: CD with ElcoMaster™ 2.0 software and data transfer cable	

Accessories

T92016967	5MHz High Damped Transducer - Steel Applications
T92016968	7.5MHz High Damped Transducer - Aluminium, Stainless Steel & Titanium Applications
T92015701	Ultrasonic Couplant, 120ml (4fl oz) Bottle
T92015874	High Temperature Ultrasonic Couplant, 60ml (2fl oz) Bottle
T9205243-	Test Wedge: 2 - 25mm (0.07 - 0.98") in 6 Steps
T9205270-	Test Wedge: 30 - 100mm (1.18 - 3.93") in 8 Steps

● Calibration Certificate supplied as standard.

[1] Dependent on material and conditions

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Elcometer 207

Precision Ultrasonic Thickness Gauge

The Elcometer 207 series of Precision Ultrasonic Thickness Gauges is designed to provide accurate measurements on thin materials. All Elcometer 207 and 207DL gauges have the special PLAS mode. This is specifically designed to provide accurate readings when measuring thin plastics.

Using the latest transducer designs, the Elcometer 207 gauges can accurately measure material thickness from 0.15 - 25.4mm (0.006-1") without the need to change the measurement mode.

STANDARDS:
ASTM E 797, EN 15317

| IE Mode | EE Mode | Plas Mode |

supplied with
ElcoMaster™2.0
data management software
see page 264

Technical Specification   C

Part Number	C207----1	C207DL----1
Model	Elcometer 207	Elcometer 207DL
PLAS Mode*	■	■
Scan & Differential Modes	■	■
Alarm Mode	■	■
Data Output (immediate)	■	■
Data Logging (memory)		1000 readings
ElcoMaster™ 2.0 Software		■
Certificate	●	●
Maximum Measurement Range	0.15 - 25.4mm (0.006 - 1")	
Velocity Range	1250 - 10000m/s (0.0492 - 0.3937 in/µs)	
Accuracy & Resolution	Accuracy[1]: ±0.02mm (0.0008"); Resolution: 0.002mm (0.0001")	
Units	Millimetres and Inches	
Operating Temperature	-30°C to 50°C (-20°F to 120°F)	
Transducer	Each unit is supplied with 15MHz, 6mm (¼") microdot right angle transducer	
Display	114mm (4½) Digit Liquid Crystal Display with backlight	
Battery Type (Life)	AA 1.5V Alkaline (200 hours)	
Weight	295g (10oz) Dimensions 63 x 120 x 31mm (2.5 x 4.5x1.24")	
Packing List	Elcometer 207 or 207DL gauge, ultrasonic couplant, 2 x batteries, carry case, microdot transducer, calibration certificate and operating instructions. CD with ElcoMaster™ 2.0 software and data transfer cable (Elcometer 207DL only)	

Accessories

T92016526	Precision Ultrasonic Transducer: Frequency 15.MHz, Crystal Diameter: 6.35mm (0.25"), Wearface Diameter: 7.42mm (0.3125"), Measurement Range in Steel: 0.15 - 25.4mm (0.006 - 1.0")
T92016871	Graphite Delay Line (for PLAS mode)
T92015701	Ultrasonic Couplant, 120ml (4fl oz) Bottle
T92015874	High Temperature Ultrasonic Couplant, 60ml (2fl oz) Bottle

* To use the PLAS mode, a special Graphite delay line is required which must be ordered separately - see Accessories

● Calibration Certificate supplied as standard.

[1] Dependent on material and conditions

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Ultrasonic Transducer Options

Elcometer has a wide range of transducers available for use with the Elcometer 205, 206, 206DL, 207 & 207DL 208 & 208DL Ultrasonic Thickness Gauges. When selecting a transducer, it is important to choose one which will meet the application, taking the following into consideration:

• The type of material to be tested
• The design of the transducer probe
• The measurement range
• Whether the shape of the substrate is flat or curved or hard to reach
• A range of frequencies and sizes are available to meet specific needs
• Straight and right angle transducers available as potted or microdot

Definitions:

• **Microdot Transducer:**
  The cable can be unplugged from the transducer and easily replaced on site should it become damaged
• **Potted Transducer:**
  Unlike the microdot transducers, the cables are hard wired into the transducer head
• **Exxon Specification:**
  The gauge and transducer combination must hit specified standards without missing the first cycle
• **High Temperature Transducers:** temperature up to 340°C (650°F)
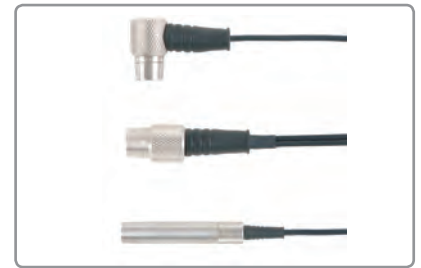
Potted Transducers   Microdot Transducer

Dual Element

Speed of Sound Through Materials

Material	km/sec	in/msec	Material	km/sec	in/msec
Air	0.33	0.013	Neoprene	1.60	0.063
Aluminium (2024-T4)	6.38	0.251	Nickel	5.64	0.222
Beryllium	12.88	0.507	Nylon	2.69	0.106
Boron Carbide	10.92	0.430	Platinum	3.69	0.156
Brass	4.39	0.173	Plexiglass	2.69	0.106
Cadmium	2.77	0.109	Polystyrene	2.34	0.092
Copper	4.65	0.183	Polyurethane	1.78	0.070
Glass (Plate)	5.77	0.227	PVC	2.39	0.094
Glycerine	1.93	0.076	Quartz	5.74	0.226
Gold	3.25	0.128	Silver	3.61	0.142
Inconel	5.82	0.229	Steel (4340)	5.84	0.230
Iron	5.89	0.232	Steel (303 Stainless)	5.66	0.223
Iron, Cast	4.55	0.179	Teflon	1.52	0.060
Lead	2.16	0.085	Tin	3.33	0.131
Magnesium	5.84	0.230	Titanium	6.10	0.240
Mercury	1.45	0.057	Tungsten	5.18	0.204
Molybdenum	6.25	0.246	Uranium	3.38	0.133
Monel	5.36	0.211	Water	1.47	0.058
Motor Oil (SAE 30)	1.75	0.069	Zinc	4.32	0.170

Elcometer 205, 206, 208 — Ultrasonic Transducer Options

Elcometer Ultrasonic Thickness Gauges can be calibrated by the user for the appropriate material in two ways:

- Set the calibration to the thickness of the known standard of the same material
- Set the frequency calibration to the appropriate value using the velocity chart below:

Part Number	Cast Iron	Plastic	Glass Fibre	Thin Glass	Steel	Glass	Thin Plastic	Aluminium	Potted	Straight Probe	Right Angle	Microdot	High Temp	Extra Res	Exxon Spec	Range mm	Range inches	Frequency MHz (Colour Code)	Crystal mm	Crystal inches	Wearface mm	Wearface inches
T92015620	■	■	■						■	■						3.8 - 51	0.15 - 2	1.0 b/y*	12.7	0.50	15.9	0.625
T92015621	■	■	■						■		■					3.8 - 51	0.15 - 2	1.0 b/y*	12.7	0.50	15.9	0.625
T92015622	■	■	■							■	■					3.8 - 51	0.15 - 2	1.0 b/y*	12.7	0.50	15.9	0.625
T92015623	■	■	■								■	■				3.8 - 51	0.15 - 2	1.0 b/y*	12.7	0.50	15.9	0.625
T92015626	■	■		■					■	■						1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015627	■	■		■					■		■					1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015628	■	■		■						■	■					1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015629	■	■		■							■	■				1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015631	■	■		■					■	■				■		1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015632	■	■		■						■	■	■				1.5 - 102	0.06 - 4	2.25 red	6.4	0.25	9.5	0.375
T92015633	■	■		■					■	■						1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015634	■	■		■					■		■					1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015635	■	■		■						■	■					1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015636	■	■		■							■	■				1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015637	■	■		■					■	■				■		1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015638	■	■		■						■	■	■				1.5 - 127	0.06 - 5	2.25 red	12.7	0.50	15.9	0.625
T92015641				■	■	■			■	■						1.5 - 51	0.06 - 2	5.0 green	4.8	0.19	6.4	0.250
T92015642				■	■	■			■		■					1.5 - 51	0.06 - 2	5.0 green	4.8	0.19	6.4	0.250
T92015644				■	■	■					■	■				1.5 - 51	0.06 - 2	5.0 green	4.8	0.19	6.4	0.250
T92015645				■	■	■			■	■						1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015646				■	■	■			■		■					1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015647				■	■	■				■	■					1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015648				■	■	■					■	■				1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015655				■	■	■			■	■				■		1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015656				■	■	■				■	■	■				1.0 - 152	0.04 - 6	5.0 green	6.4	0.25	9.5	0.375
T92015657				■	■	■			■	■						1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015658				■	■	■			■		■					1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015659				■	■	■				■	■					1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015660				■	■	■					■	■				1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015661				■	■	■			■	■				■		1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015662				■	■	■					■	■				1.3 - 508	0.05 - 20	5.0 green	12.7	0.50	15.9	0.625
T92015663				■	■	■	■		■	■					■	1.0 - 152	0.04 - 6	7.5 grey	6.40	0.25	9.5	0.375
T92015664				■	■	■	■		■		■				■	1.0 - 152	0.04 - 6	7.5 grey	6.40	0.25	9.5	0.375
T92015665				■	■	■	■			■	■				■	1.0 - 152	0.04 - 6	7.5 grey	6.40	0.25	9.5	0.375
T92015666				■	■	■	■				■	■			■	1.0 - 152	0.04 - 6	7.5 grey	6.40	0.25	9.5	0.375
T92015667				■	■	■	■	■	■	■					■	0.6 - 152	0.025 - 6	7.5 blue	6.40	0.25	9.5	0.375
T92015668				■	■	■	■	■	■		■				■	0.6 - 152	0.025 - 6	7.5 blue	6.40	0.25	9.5	0.375
T92015669				■	■	■	■	■		■	■				■	0.6 - 152	0.025 - 6	7.5 blue	6.40	0.25	9.5	0.375
T92015670				■	■	■	■	■			■	■			■	0.6 - 152	0.025 - 6	7.5 blue	6.40	0.25	9.5	0.375
T92015671				■					■	■			■			1.0 - 152	0.04 - 6	10.0 white	6.40	0.25	9.5	0.375
T92015672				■					■		■		■			1.0 - 152	0.04 - 6	10.0 white	6.40	0.25	9.5	0.375
T92015673				■						■	■		■			1.0 - 152	0.04 - 6	10.0 white	6.40	0.25	9.5	0.375
T92015674				■							■	■	■			1.0 - 152	0.04 - 6	10.0 white	6.40	0.25	9.5	0.375
T92015676				■					■	■			■			1.5 - 254	0.06 - 10	10.0 white	12.7	0.50	15.9	0.625
T92015677				■					■		■		■			1.5 - 254	0.06 - 10	10.0 white	12.7	0.50	15.9	0.625
T92015678				■						■	■		■			1.5 - 254	0.06 - 10	10.0 white	12.7	0.50	15.9	0.625
T92015679				■							■	■	■			1.5 - 254	0.06 - 10	10.0 white	12.7	0.50	15.9	0.625
T92016526	■		■	■	■	■	■	■				■				0.15 - 25.4	0.006 - 1.0	15.0 green	6.35	0.25	7.42	0.3125

*b/y - Brown and Yellow

Surface Preparation

Comparators, Surface Profile & Surface Cleanliness

Surface preparation is one of the most important factors in the successful application of a coating or surface treatment and is critical to the effective lifetime of the coating. For any coating to perform successfully it is essential that the substrate is prepared properly.

Ensuring the correct surface preparation optimises the performance of the coating and material usage. Elcometer supply a range of products to meet each of the key industry standard surface preparation inspection methods.

Surface condition: Degree or percentage of rust, level of mill scale, etc can be visibly assessed using Pictorial Surface Standards. Weld beads can be assessed utilising a weld comparator and weld gauges measure a range of quality parameters.

Surface contamination: Soluble salts & ion specific contamination (sulphates, chlorides, nitrates etc.) which are often invisible to the eye, together with amine blush (for amine cured epoxy coatings) can result in premature coating failure, resulting in high re-coating and maintenance costs. Elcometer has a range of test equipment for assessing surface cleanliness prior to applying a coating.

Blasted profiles: A number of important parameters need to be monitored during the blasting process, these include: air pressure (at the nozzle), nozzle diameter and blast media contamination, in order to avoid recontamination of the substrate during blasting.

Surface profile: The degree of profile on the surface affects a coating's overall performance and determines aspects such as adhesion, coverage and overall volume of coatings used. If the profile is too large the amount of coating required increases, otherwise there is a danger that the peaks uncoated - allowing rust spots to occur. If the profile is too small there may be an insufficient key for adequate adhesion.

Elcometer offer a range of products to measure surface profile, including:

Surface comparators: Used to provide a quick comparison of the blasted substrate against predefined grit, shot or sand profiles.

Replica tape: A foam back plastic test piece pressed into the blasted surface to provide a numerical value for the profile and a proof of test.

Surface profile gauges: As the wide flat base of the gauge rests on the top of the profile, a spring loaded needle records the value of the peak to the bottom of the valley.

Surface roughness testers: these consist of a stylus attached to an arm which moves over the surface to record and measure the profile, ideal for inspection finer profiles.

elcometer®

Elcometer 128   Pictorial Surface Standards

Elcometer's range of Surface Standards covers most of those required for surface cleanliness. Surface Standards include:

Technical Specification

Part Number	Description
E128----1	BS EN ISO 8501-1:2007/SIS 055900 - the original visual standard. It shows the degree of cleanliness of different levels of rusted steel cleaned by blasting, hand and power tools and flame, specified by ASTM D2200 Method A
E128----3	SSPC (Steel Structures Painting Council) VIS 1 - similar to the Swedish and British standards, but the pictures of the required final appearances match the written descriptions in the USA standards. VIS 1-89 includes photographs of surfaces cleaned using metallic and non-metallic abrasives. Specified by ASTM D2200 Method B
E128----5	SSPC - VIS 3 - contains 44 photographs to supplement the written SSPC specifications for hand and power tool cleaning
E128----6	SSPC - VIS 2 Standard method of evaluating the degree of rusting on painted steel surfaces
E128----7	SSPC - VIS 4 Guide and reference photographs for steel surfaces prepared by waterjetting
E128----8	SSPC - VIS 5 Guide and reference photographs for steel surfaces prepared by wet abrasive
E128----9	BS EN ISO 8501-4:2006 - preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Initial surface conditions, preparation grades and flash rust grades in connection with high-pressure water jetting

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STANDARDS:

ASTM D 2200, IMO MSC.215(82), IMO MSC.244(83), ISO 8501-1, SS 55900, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000,

Pit Gauge

The Elcometer 119 Pipe Pit Gauge is a pocket sized gauge designed to identify the condition of a pipe.

The gauge is placed horizontally on the surface of the pipe and the stylus is positioned into the base of the corrosion pit.

The gauge shows the pit depth compared to the nominal pipe wall thickness. Imperial units only.
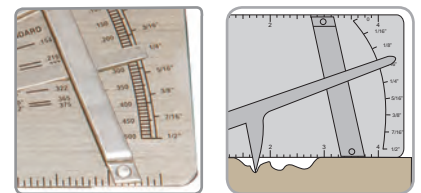
Technical Specification

Part Number	Description
E119-----	Elcometer 119 Pipe Pit Gauge
Range	0 - 500mils (0 - 0.5")
Graduation	10mils and 1/16"
Dimensions	68 x 133 x 4mm (21 x 5.25 x 0.18")
Weight	227g (8oz)

Weld Gauge

The Elcometer 147 Weld Gauge measures many aspects of welds in both metric and imperial units and includes:

- angle of preparation 0 to 60°
- misalignment (high - low)
- fillet weld throat size
- fillet weld length
- 2mm (0.79") edge roundness test
- excess weld metal (capping size)
- depth of undercut
- depth of pitting
- general linear measurements up to 60mm (2")

Technical Specification

Part Number	Description
H147----1	Elcometer 147 Weld Gauge
Angle of Preparation Scale	0 - 60° in 5° divisions
Misalignment Scale	0 - 25mm in 1mm divisions and 0 - 1" in 1/16" divisions
Fillet Leg & Excess Weld Scale	0 - 25mm in 1mm divisions and 0 - 1" in 1/16" divisions
Fillet Throat Scale	0 - 20mm in 1mm divisions and 0 - 3/4" in 1/16" divisions
Undercut Scale	0 - 4mm in 1mm divisions and 0 - 1/4" in 1/16" divisions
Dimensions	100 x 68mm (3.9 x 2.7")
Weight	154g (5.4oz)
Packing List	Elcometer 147 Weld Gauge and instruction card

elcometer®

Weld Comparator

The Elcometer Surface Weld Comparator provides for the first time, a means of comparing the quality of welds.

Made from durable T Grade ABS plastic, the comparator comprises of 14 different examples of actual welds, allowing a thorough evaluation to be completed.

Each Weld Gauge is supplied complete with a copy of the NACE SP0178-2007 Standard, providing detailed recommendations on design, fabrication and surface finish requirements. It includes generic and graphic descriptions of various degrees of surface finishing of welds that may be specified in preparation for the lining of tanks and vessels.

STANDARDS:
SP0178-2007, RP0178

Technical Specification

Part Number	Description
H99921527	Elcometer Surface Weld Comparator

Elcometer 134A   Chloride Ion Test Kit for Abrasives

Chlorides deposited on a surface by contaminated abrasives during blasting can cause a coating to fail prematurely.

Contamination can build up, particularly if the blast media is recycled several times. Using the Elcometer 134A Chloride Ion Test in the field will accurately identify contamination and prevent costly surface-related failures.

Technical Specification

Part Number	Description
E134----2	Elcometer 134A Chloride Ion Test Kit for Abrasives
Measuring Range	1 - 60µg/cm² (1 - 60ppm)
Scale Resolution	1µg/cm² (1ppm)
Sample Time	1.5 minutes (approx)
Tests per Kit	4
Storage Conditions	Not exceeding 25°C (77°F)
Dimensions	185 x 125 x 110mm (7 x 5 x 4.5")
Weight	367g (13oz)
Packing List	4 x test kits, containing: abrasive sample container, mixing container with a pre-measured quantity of solution, titration tube, titration tube snapper, strap and operating instructions

elcometer.

Chloride Ion Test Kit for Water

Elcometer 134W

The Elcometer 134W is used to monitor recycled water (after it has been applied) to establish effectiveness of salt removal, this test is ideal when mixing concrete and when washing steel.

If the chloride levels in the wash water are too high, this will promote premature corrosion, shortening the life of both steel and concrete structures.

Technical Specification

Part Number	Description
E134----3	Elcometer 134W Chloride Ion Test Kit for Liquids
Measuring Range	10 - 2000µg/cm² (10 - 2000ppm)
Scale Resolution	10µg/cm² (10ppm)
Sample Time	1.5 - 4 minutes (approx)
Tests per Kit	5
Storage Conditions	Not exceeding 25°C (77°F)
Dimensions	185 x 125 x 110mm (7 x 5 x 4.5")
Weight	208g (7oz)
Packing List	5 x test kits each containing: sample container bottle with dropper in lid, titration tube, titration tube snapper and operating instructions

For Chloride Ion Test Kits for surfaces see page 141

pH Test Strips

Elcometer 138/2

The Elcometer 138/2 pH Test Strips provide the user with a means for testing acidic or alkaline contaminants.

Day to day air particulate contaminants generated by modern industry generate particulates of hydrocarbons such as sulphur. Agricultural fertilizers generate nitrates. When they combine with moisture in the atmosphere they create sulphuric and nitrate acids, which if present on the substrate, breakdown the surface of any coating. Furthermore, any water used to clean the surface containing levels of pH will have a similar affect.

Technical Specification

Part Number	Description
T13820562	100 x pH Test Strips

elcometer ®

Elcometer 148

pH Tester

pH is the measure of acidity of a liquid. The pH scale ranges from 0 to 14pH - where 0pH is acidic and 14pH is alkaline. This simple, easy to use instrument measures both pH and temperature using a single sensor.

In many industries, pH measurement is critical to the correct performance of processes. pH is temperature dependent thus the temperature of the sample under test will affect the pH value recorded.

The Elcometer 148 sensor has automatic temperature compensation, ensuring like-for-like measurements can be taken for meaningful comparison of the results.

The condition of the sensor is automatically monitored after each successive calibration and sensors can be easily replaced by the user as and when required.

• Simultaneously displays pH and temperature.
• Measurement hold / freeze function.
• Record maximum and minimum readings over a series of tests.
• ºC / ºF user switchable.
• Waterproof to IP57 and floats on water.
• Auto power off.
• Battery level indicator.

Technical Specification

Part Number	Description	
H148----1	Elcometer 148 pH Tester	
	pH	Temperature
Range	0 to 14pH	0 to 89ºC (32 to 192ºF)
Resolution	0.01pH	0.1ºC (0.1ºF)
Accuracy	±0.03pH	±0.5ºC (±1ºF)
Battery	4 x 1.5v AAA	
Calibration	3 point at 7pH, 4pH and 9pH	
Dimensions	195 x 40 x 36mm (7.7 x 1.6 x 1.42")	
Weight	150g (5.3oz)	
Packing List	Elcometer 148 pH Tester, pH/Temperature sensor, 4 x AAA batteries, wrist strap, 4pH calibration sachet, 7pH calibration sachet and operating instructions.	

Accessories

T14821766	pH/Temperature Sensor
T14821768-1	4pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821768-2	7pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821768-3	9pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821767-1	4.01pH Buffer Solution for Calibration: 100ml Bottle
T14821767-2	7pH Buffer Solution for Calibration: 100ml Bottle
T14821767-3	10.01pH Buffer Solution for Calibration: 100ml Bottle

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Needle Pressure Gauge

Elcometer 102

The Elcometer 102 Needle Pressure Gauge is designed to measure air pressure in blast and air hoses. Pressure drop is responsible for decreased production rates, increased abrasive consumption and reduced anchor profile in abrasive blasting systems.

Technical Specification

Part Number	Description		
E102----A	Elcometer 102 Needle Pressure Gauge		
Measuring Range	0-160 psi		
Dimensions	130 x 55 x 26mm (5.12 x 2.16 x 1.02")	Weight	184g (6.49oz)
Packing List	Elcometer 102 Needle Pressure Gauge, pressure gauge guard, spare hypodermic needle, protective pouch and operating instructions.		

Blast Nozzle Gauge

Elcometer 103

The Elcometer 103 Blast Nozzle Gauge measures the orifice size of an abrasive blasting nozzle. This gauge is used to determine the nozzle orifice wear which leads to low nozzle pressure and decreased efficiency in the performance of the nozzle's venturi. Nozzle orifice wear results in decreased productivity and increased abrasive media consumption.

Technical Specification

Part Number	Description		
E103----A	Elcometer 103 Blast Nozzle Gauge		
T10323558	Replacement Wax/Grease Pencil (Pack of 12)		
Measuring Range	1/4 - 5/5" (81-548 CFM)		
Dimensions	200 x 19mm (7.87 x 0.75")	Weight	150g (0.67oz)
Packing List	Elcometer 103 Blast Nozzle Gauge, wax/grease pencil (inside gauge), protective pouch and operating instructions.		

How to use a Needle Pressure Gauge
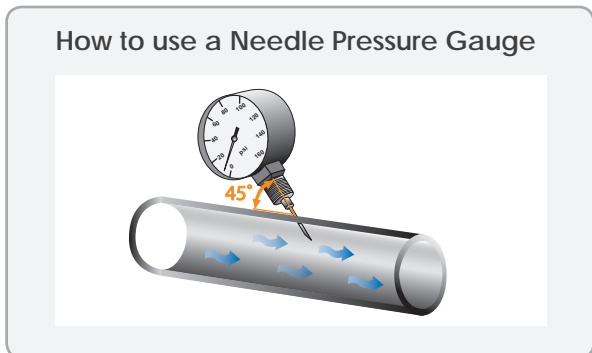
How to use a Blast Nozzle Gauge
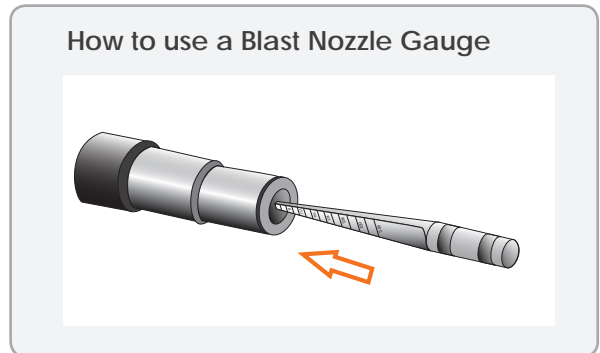
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Elcometer 224   Digital Surface Profile Gauge

STANDARDS:
ASTM D 4417-B, SANS 5772,
US Navy NSI 009-32,
US Navy PPI 63101-000

new

Stores up to 150,000 readings in alpha numeric batches

Accurate, immediate and repeatable results

Tough tungsten carbide user replaceable tip

Integral & separate probe variants for flat and convex* surfaces

Auto rotating display with tap awake feature

Dust and water resistant rugged design equivalent to IP64

2.4" colour screen provides enhanced reading visibility at all angles

Ergonomic design for comfort during continuous use

Integral or separate probes measure profiles up to 500µm (20mils) on flat or curved surfaces*

elcometer®

Fast reading rate at 50+ readings per minute^

Review batch data or last 20 readings in a graph format

supplied with
ElcoMaster™2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 123

Measures on flat and convex surfaces

new

USB and Bluetooth® data output to ElcoMaster™ 2.0 software

Counted average mode stores the average value of a preset number of readings

The Elcometer 224 provides the very latest in surface profile measuring technology for measuring profile on either flat or curved surfaces. Fast, accurate and very user friendly, the Elcometer 224 is available with or without memory and Bluetooth®.

* Patent applied for

^ Convex probe up to 25 readings per minute

Elcometer 224   **Digital Surface Profile Gauge**

Designed with you in mind

User Friendly

- Large buttons ideal for gloved hands
- Easy to use menus in multiple languages
- High contrast colour LCD with auto rotate
- High and low reading limit indicators
- Factory calibrated for immediate use

Accurate

- Measurement capability to ±5%
- Can be used in accordance with National and International Standards
- Temperature stable measurements
- Statistics are calculated and displayed in real time
- Live and batch readings graph format for instant analysis

Reliability

- Repeatable and reproducible
- 2 year gauge warranty
- Supplied with fully traceable Test Certificates
- Batch & individual reading date and time stamp facility

Tough

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP64
- Scratch and solvent resistant display
- Durable gauge and probe construction
- Suitable for use in harsh environments

Efficient

- Fast reading rate of 50+ per minute
- Integral and separate probe versions to suit your application
- Alpha numeric batch identification
- Compatible with ElcoMaster™ 2.0 and ElcoMaster™ Mobile App
- Powersave mode with tap awake

Powerful

- Tough tungsten carbide user replaceable tip - can be used for up to 20,000 readings
- USB and Bluetooth® data output
- Stores up to 150,000 readings in 2,500 batches
- Measures profiles up to 500µm (20 mils)

Measures on flat and convex surfaces
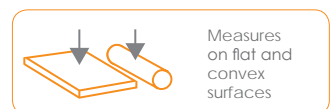
Integral and separate probe version available, see page 124.

elcometer®

Digital Surface Profile Gauge

Elcometer 224

Product Features

	Model B	Model T
Fast, accurate reading rate; *50+ readings per minute^*	■	■
Repeatable & reproducible measurements	■	■
Easy to use menu structure; *in 30+ languages*	■	■
Tough, impact, water & dust resistant; *equivalent to IP64*	■	■
Bright colour screen; *with permanent back light*	■	■
Scratch & solvent resistant display; *2.4" (6cm) TFT*	■	■
Large positive feedback buttons	■	■
Flat & convex surfaces*	■	■
USB power supply; *via PC*	■	■
Test certificate	■	■
2 year gauge warranty	■	■
Automatic rotating display; *0°, 90°, 180° & 270°*	■	■
Ambient light sensor; *with adjustable auto brightness*	■	■
Emergency light mode	■	■
Gauge software updates[1]; *via ElcoMaster™ 2.0 software*	■	■
Data output	■	■
USB; *to computer*	■	■
Bluetooth®: *to computer, Android™ mobile phone or tablet*		■
On screen statistics	■	■
Number of readings, η; Mean (average), x; Standard deviation, σ; Highest reading, hi; Lowest reading, lo; Coefficient of variation, COV	■	■
High & low limits; *definable audible & visual alarms*		■
Number above high limit;		■
Number below low limit;		■
ElcoMaster™ 2.0 software & USB cable		■
Alarm; *daily (d), interval (i)*		d,i
Date and time stamp *for each reading*		■
Replaceable screen protectors	■	■
Protective case	■	■
Plastic transit case	□	■
Measurement range	0-500µm (20 mils)	0-500µm (20 mils)
On-screen calibration instructions; *in 30+ languages*	■	■
Number of batches		2,500
Gauge memory; *number of readings*	Last 5	150,000
Delete last reading	■[#]	■
Limits; *user definable audible & visual pass/fail warnings*		■
Gauge (g) or gauge & batch specific (gb) limits		gb
Batch types; *normal, counted average*		■
Review, clear & delete batches		■
Copy batches and calibration settings		■
Alpha-numeric batch names; *user definable on the gauge*		■
Fixed batch size mode; *with batch linking*		■
Trend graph; *last 20 readings*		■
Review batch graph		■

new

■ Standard   □ Optional
[1] Internet connection required   [#] Up to the last 5 readings can be deleted   * Patent applied for   ^Up to 25 readings per minute for the convex probe

elcometer®

Elcometer 224

Digital Surface Profile Gauge

new

The Elcometer 224 is available in two different models: Model B and Model T. Each gauge provides the user with increasing functionality - from the entry level Elcometer 224 Model B, to the top of the range Elcometer 224 Model T, with memory, alpha-numeric batching and Bluetooth® communication.

Integral gauges are ideal for single handed operation as the wide footprint of the internal probe provides greater stability during measurement - allowing for consistent, repeatable and accurate results.

Standard and armoured probes are available for the separate models, providing even greater measurement flexibility. See pages 125 - 126 for more details.

STANDARDS:
ASTM D 4417-B, SANS 5772,
US Navy NSI 009-32,
US Navy PPI 63101-000

supplied with
ElcoMaster™2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 123

Model Options   C

Part Number		Description	Certificate
Integral Gauge	Separate Gauge^		
E224C-BI	E224C-BS	Elcometer 224 Model B Digital Surface Profile Gauge	●
E224C-TI	E224C-TS	Elcometer 224 Model T Digital Surface Profile Gauge	●

Technical Specification

Display information	2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels	
Battery type	2 x AA dry cell batteries, rechargeable batteries can also be used	
Battery life	Approximately 24 hours of continuous use at 1 reading per second#	
Minimum Headroom	Integral:	185mm (7.3")
	Separate:	See page 126
Gauge dimensions (h x w x d)	Integral:	168 x 73 x 37mm (5.61 x 2.87 x 1.46")
	Separate:	141 x 73 x 37mm (5.55 x 2.87 x 1.46")
Gauge weight (including batteries)	Integral:	218g (7.69oz)
	Separate:	161g (5.68oz)
Measurement range	0-500µm (0-20mils)	
Probe tip	Tungsten carbide tip 60° angle; Tip Radius: 50µm (2mil)	
Operating temperature	-10 to 50°C (14 to 122°F) Storage temperature -10 to 60°C (14 to 140°F)	
Accuracy & Resolution	Accuracy*: ±5% or ±5µm (±0.2mil); Resolution: 1µm (0.1mil)	
Packing List†	Elcometer 224 gauge, glass zero tile†, 2 x calibration foils†, wrist harness, plastic transit case (T), protective case, screen protector, probe protection cap†, 2 x AA batteries, test certificate, operating instructions, USB cable (T) & ElcoMaster™ 2.0 software (T)	

^ Probes are supplied separately, see pages 125 - 126 for details

* Whichever is the greater

Using default settings & lithium batteries supplied, alkaline or rechargeable batteries may differ.

† For separate gauges, the test foils, glass zero tile and probe protection cap are supplied with the separate probe.

● Calibration Test Certificate supplied as standard.

elcometer®

Probe range

The Elcometer 224 Digital Surface Profile Gauge is available with either an integral or separate probe. All Elcometer surface profile probes are fitted with a tough tungsten carbide user replaceable tip as standard, suitable for up to 20,000 readings.

The Elcometer 224 separate gauge with its range of interchangeable probes offer greater flexibility to suit any application.

Separate probes are available to measure surface profile on flat or convex surfaces.

new

Flat Surface Probe
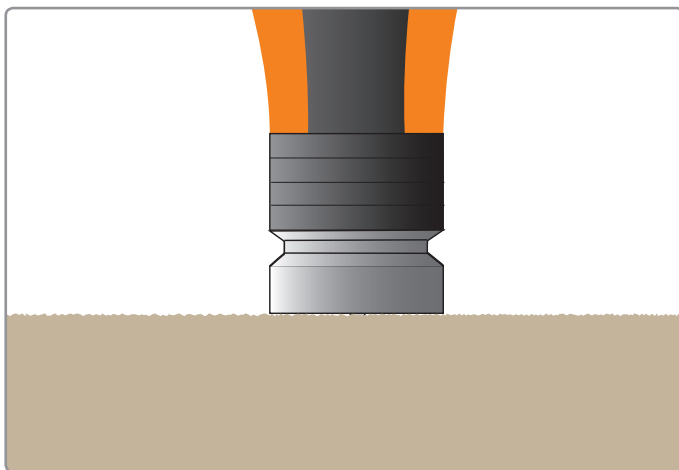
Convex Surface Probe*
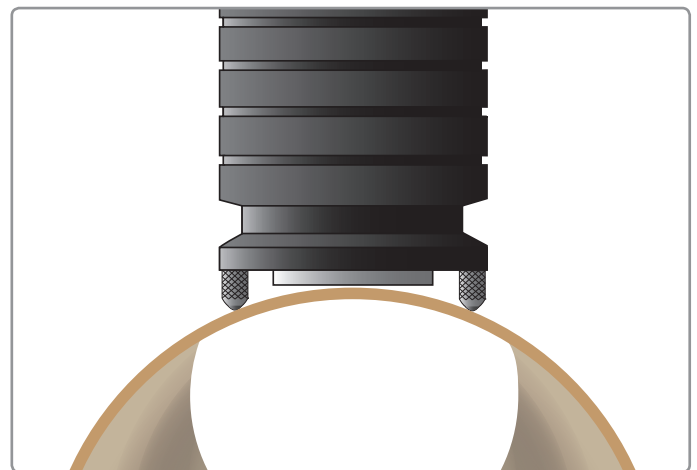
How to measure surface profile
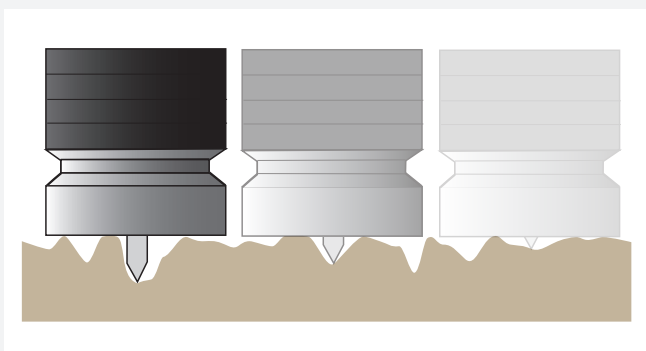
1. Calibrate on a glass zero plate.
2. Ensure probe is 90° to substrate to ensure accurate readings.
3. Take between 5 and 10 readings to establish the average surface profile, within a 150 x 150mm (6 x 6") area.

* Patent applied for

elcometer®

Elcometer 224   Digital Surface Profile Probes

new

Flat Surface Profile Probes
Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer surface profile probes are supplied with a glass zero plate, calibration test foils; nominal values 125µm (5.0mils) & 508µm (20mils) and an Elcometer test certificate.

Technical Specification   C

Range: 0-500µm (0-20mils)		Resolution: 1µm (0.1mil)		Accuracy: ±5% or ±5µm (±0.2mil)	
Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate	
Flat Surface: Standard	T224C500US	125mm (4.92")	25mm (1.0")	●	
Flat Surface: Armoured	T224C500UARM	165mm (6.50")	25mm (1.0")	●	

new

Convex Surface Profile Probes
Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer surface profile probes are supplied with a glass zero plate, calibration test foils (nominal values 125µm (5.0mils) & 508µm (20mils) and an Elcometer test certificate .

Technical Specification   C

Range: 0-500µm (0-20mils)		Resolution: 1µm (0.1mil)		Accuracy: ±5% or ±5µm (±0.2mil)	
Probe Design	Part Number	Minimum Headroom	Minimum Pipe Diameter	Certificate	
Convex Surface: Standard*	T224C500UX	135mm (5.31")	75mm (3.0")	●	
Convex Surface: Armoured*	T224C500UXARM	175mm (6.89")	75mm (3.0")	●	

Accessories

Part Number		Description
Integral Gauge	Separate Gauge	
T22419793	T22419793	Probe Tip Protection Cap
T22420072	T22420072	Glass Zero Tile with Wallet
T22421882C	T22421882C	Certified Calibration Test Kit: 125µm & 500µm (5 & 20mils) Calibration Foils, Glass Zero Tile & Calibration Certificate
T99921325	T99921325	USB Cable
T99920130	T99920130	USB Bluetooth Adaptor - for PC's without Bluetooth
T99922341	T99922341	Self Adhesive Screen Protectors (x10)
T22423368	T99923369	Protective Case
T22423370	T22423371	Plastic Transit Case
T22420053	T22420053	Replacement Tip (Pack of 2) with Fixing Tool
T22420095	T22420095	Replacement Tip (Pack of 5)

* Patent applied for

● Test Certificate supplied as standard.

elcometer®

ElcoMaster 2.0
DATA MANAGEMENT SOFTWARE

Combines all your inspection records in one report, instantly!

From surface profile to climate monitoring, dry film thickness to data management; Elcometer combines high quality products with simple data management, producing professional inspection reports at the click of a button.

Surface Profile

The Elcometer 224 digital surface profile gauge, available as either integral or separate probe versions, is faster than ever before.

See page 120

Climate Monitoring

The Elcometer 319 dewpoint meter records all the critical climate parameters for the coating's professional: surface, air & dewpoint temperatures, %RH & ΔT.

See page 150

Coating Thickness

Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.

See page 182

ElcoMaster™ 2.0

ElcoMaster™ 2.0 is the simple yet powerful software solution; combining all your inspection results instantly in one professional report.

See page 264

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Elcometer 223 — Digital Surface Profile Gauge

The Elcometer 223 Digital Surface Profile Gauge measures the peak-to-valley height of a surface in a similar way to the Elcometer 224.

• RS232 output - for direct transfer of readings to a PC, providing a permanent record of your test results

• Metric and Imperial switchable measuring profiles up to 1000µm (0 - 40mils)

STANDARDS:
ASTM D 4417-B, SANS 5772,
US Navy NSI 009-32,
US Navy PPI 63101-000

Technical Specification — C

Part Number	Description			Certificate
E223----2	Elcometer 223 Digital Surface Profile Gauge			o
Range	0 - 1000µm (0 - 40mils)	Resolution	1µm (0.1mil)	
Power Supply	3V Lithium CR2032 Battery			
Dimensions	105 x 55 x 25mm (4.1 x 2.2 x 1")	Weight	365g (9oz)	
Packing List	Elcometer 223 Digital Surface Profile Gauge, glass slide, 2mm allen key, carry case and operating instructions			

Elcometer 123 — Surface Profile Gauge

The Elcometer 123 Surface Profile Gauge is an easy to use analogue gauge which measures the peak-to-valley height of a blast cleaned surface in a similar way to the Elcometer 224.

• Available in both Metric and Imperial versions

STANDARDS:
ASTM D 4417-B, SANS 5772,
US Navy NSI 009-32,
US Navy PPI 63101-000

Technical Specification — C

Part Number	Description			Certificate
E123A--M-	Elcometer 123 Surface Profile Gauge, Metric Version			o
E123A--E-	Elcometer 123 Surface Profile Gauge, Imperial Version			o
Range	0 - 1000µm (0 - 40mils)	Scale	2µm (0.1 mil)	
Dimensions	105 x 55 x 25mm (4.1 x 2.2 x 1")	Weight	335g (8oz)	
Packing List	Elcometer 123 Surface Profile Gauge, glass slide, 2mm allen key, carry case and operating instructions			

o Certificate available as optional extra. Order as a separate line item adding the pre-fix QC to the Part Number e.g. ordering part number QCE123A--M- would purchase a calibration certificate for the model E123A--M-.

elcometer®

Testex® Replica Tape

Elcometer 122

Elcometer 122 Testex Tape consists of foam with a non-compressible backing. The foam side is rubbed into the surface providing a permanent mould of the peak-to-valley profile, which can then be measured using the Elcometer 124 Thickness Gauge.

Elcometer 122 Testex Tape is available in three profile ranges. It is important that the tape grade chosen is reflective of the profile being measured, as using tape grade below the actual value may provide a "false" reading.

There are 50 tests in each roll. Test Area Dimensions: 19 x 54mm (0.75 x 2.23")

STANDARDS:

ASTM D 4417-C, BS 7079-C5, ISO 8503-5, NACE RP0287, US Navy NSI 009-32, US Navy PPI 63101-000

Technical Specification

Description	Profile Range		Part Number			
	Metric	Imperial	1 Roll	Pack of 10	Pack of 50	Pack of 100
Elcometer 122 Coarse	20 - 38µm	0.8 - 1.5mils	E122----B1	E122----B10	E122----B50	E122----B100
Elcometer 122 X-Coarse	64 - 115µm	2.5 - 4.5mils	E122----C1	E122----C10	E122----C50	E122----C100
Elcometer 122 X-Coarse Plus	115 - 127µm	4.5 - 5.0mils	E122----F1	E122----F10	E122----F50	E122----F100

Thickness Gauge

Elcometer 124

The Elcometer 124 Thickness Gauge is used to measure the peak-to-valley height of a surface profile moulded in the Elcometer 122 Testex Replica Tape.

- Available in both Metric and Imperial versions
- Quick and easy to use
- Anvil pressure as required in the Standards

STANDARDS:

ASTM D 4417-C, BS 7079-C5, ISO 8503-5, NACE RP0287, US Navy NSI 009-32, US Navy PPI 63101-000

Technical Specification   C

Part Number	Description	Range	Dimensions	Weight	Scale Resolution	Certificate
E124---3M	Elcometer 124 Metric	0.5mm	125 x 95 x 25mm	270g	2µm	○
E124---3E	Elcometer 124 Imperial	0.2"	4.9 x 3.6 x 1.0"	9.6oz	0.1mil	○

○ Certificate available as optional extra. Order as a separate line item adding the pre-fix QC to the Part Number e.g. ordering part number QCE124---3M would purchase a calibration certificate for the model E124---3M.

Elcometer 125

Surface Comparators

These extremely durable comparators allow the estimation of surface roughness of either grit and shot blasted surfaces. Using the Elcometer 125 surface comparators as a reference the blasted profile can be compared to the four reference profile grades in each comparator. Profiles are recorded in microns.

• 4 Roughness Values per Comparator

STANDARDS:
AS 3894.5, ASTM D 4417-A,
IMO MSC.215(82), IMO MSC.244(83),
ISO 8503-1, ISO 8503-2

Technical Specification

Part Number	Description	Section Profiles
E125----1	Elcometer Grit Surface Comparator	25, 60, 100, 150µm
E125----2	Elcometer Shot Surface Comparator	25, 40, 70, 100µm

Elcometer 127

Keane-Tator Surface Comparators & Magnifier

The Elcometer 127 range of Surface Comparators are available in sand, shot or grit surface profiles. Each comparator is supplied with 5 profile grades ranging from 0.5 - 5.5mils. Designed for use with the Elcometer 127 illuminated magnifier, each comparator has a hole in the centre allowing for clear visual comparisons to be made.

• 5 Roughness Values per Comparator

STANDARDS:
AS 3894.5, ASTM D 4417-A

Technical Specification

Part Number	Description	Section Profiles
E127----2	Elcometer 127 Sand Surface Comparator	0.5, 1, 2, 3, 4 mils
E127----3	Elcometer 127 Grit Surface Comparator	1.5, 2, 3, 4, 5 mils
E127----4	Elcometer 127 Shot Surface Comparator	2, 2.5, 3, 4, 5.5 mils
E127----1	Illuminated magnifier (x 5) with integrated surface comparator holder	

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Rubert & Rugotest Surface Comparators

Elcometer 129

The Elcometer 129 Surface Comparators are available in two models:

- Elcometer 129 Rubert - available in grit and shot versions
- Elcometer 129 Rugotest - shot and grit profiles on the same block

Roughness is displayed in both "classes" and "roughness averages" for easier identification and are available in Metric units.

- 6 Roughness Values per Comparator

STANDARDS:
AS 3894.5

Technical Specification

Part Number	Description	Section Profiles
E129----1	Elcometer 129/1 Rubert Grit Surface Comparator	0.4, 0.8, 1.6, 3.2, 6.3, and 12.5µm
E129----2	Elcometer 129/2 Rubert Shot Surface Comparator	0.4, 0.8, 1.6, 3.2, 6.3, and 12.5µm
E129----3	Elcometer 129/3 Rugotest Shot & Grit Surface Comparator	N6, N7, N8, N9, N10 and N11 equivalent to 0.8, 1.6, 3.2, 6.3, 12.5, and 25µm roughness averages respectively

Ship's Propeller Comparators

Elcometer 133

The Elcometer 133 Ship's Propeller Comparators have been developed with the specific profiles relating to the condition of a ship's propeller.

Two versions are available; for above water (dry dock) inspection and for inspection work carried out underwater.

- 6 Roughness Values per Comparator

Technical Specification

Part Number	Description	Section Profiles	
		Ra*	Rz#
H133--15A	Elcometer 133 Surface Comparator	1, 2, 4, 8, 16, 30µm	6, 12, 24, 48, 96, 180µm
H133--16A	Elcometer 133 Underwater Comparator	1, 2, 4, 8, 16, 30µm	6, 12, 24, 48, 96, 180µm

*Ra = Roughness Average
#Rz = Peak to Valley Mean Height

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Elcometer 7061

MarSurf PS1 Surface Roughness Tester

The Elcometer 7061 is a light weight and portable measuring solution for the range of surface roughness measurements required for compliance to International Standards.

The unit is also suitable for assessing surface roughness conditions in a wide range of general industrial applications; particularly where the sample is too large to bring to the laboratory.

Measurements of Surface Roughness are expressed in terms of Ra, Rz or Rt. These values include peak-to-valley profile measurement in combination with an assessment of the frequency of peaks within the sample area.

- Multilingual Display
- Integrated Calibration Standard

STANDARDS:
ASTM D4417, ASME B46, DIN 4768, EN 10049, ISO 4287, ISO 4287/1, JIS B 0601

Technical Specification

Part Number	Description
K7061M001	Elcometer 7061 MarSurf PS1 Surface Roughness Tester
Unit of Measurement	Metric, Imperial
Stylus Pick-Up*	Inductive skidded stylus pick-up, 2µm (80µin) stylus tip, measuring force approx. 0.7 mN
Parameters	Ra, Rq, Rz equiv. to Ry (JIS), Rz (JIS), Rmax, Rp, Rp (ASME), Rpm (ASME), Rpk, Rk, Rvk, Mr1, Mr2, A1, A2, Vo, Rt, R3z, RPc, Rmr equiv. to Tp (JIS, ASME), RSm, R, Ar, Rx
Measuring Range	0-350µm (0-13.78mils) Resolution 8nm-32nm (0.315-1.260µin)
Filter	Phase-correct profile filter (Gaussian filter) according to DIN EN ISO 11562, special filter according to DIN EN ISO 13565-1, ls filter according to DIN EN ISO 3274 (can be disabled)
Cutoff (lc)	0.25mm, 0.8mm, 2.5mm; automatic (0.010", 0.030", 0.100")
Traversing lenght (Lt)	1.75mm, 5.6mm, 17.5mm; automatic (0.069", 0.22", 0.69")
Traversing lenght (acc. to MOTIF)	1mm, 2mm, 4mm, 8mm, 12mm, 16mm (0.040", 0.080", 0.160", 0.320", 0.480", 0.640")
Evaluation length (ln)	1.25mm, 4.0mm, 12.50mm (0.050", 0.15", 0.50")
Number (n) of sampling lengths	Selectable: 1 to 5
Memory capacity	Max. 15 profiles, max. 20,000 results
Battery	Li-ion rechargeable battery 100V to 264V power supply
Dimensions	140mm × 50mm × 70mm (5.51" × 1.97" × 2.76") Weight 400g (0.88lbs)
Packing List	Elcometer 7061 MarSurf PS1 base unit, drive unit, 1 x standard stylus pick-up, built-in battery, roughness standard integrated into casing, height adjustment accessory, stylus pick-up protection, universal charger / mains adapter, USB cable, carry case with shoulder strap and belt loop, calibration certificate and operating instructions

* Other stylus pick-ups are available

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Elcometer 7061   **MarSurf PS1 Surface Roughness Tester**

Accessories

Part Number	Description
KT007061P001	**Stylus pick-up Extension; 80mm (3.15")**, ideal for measuring points located deep within cylinders
KT007061P002	**Stylus pick-up PHT 3-350**, for measurements in bores from 3mm (0.12") diameter
KT007061P003	**Stylus pick-up PHT 11-100,** for measurements at recessed measuring points, e.g. in grooves from 2.5mm (0.10") wide and up to 7.5mm (0.30") deep
KT007061P004	**Stylus pick-up PHTR 100,** for measurements on concave and convex surfaces
KT007061P005	**Stylus pick-up PHTF 0.5-100**, for measurements on tooth flanks
KT007061P006	**Stylus pick-up PT 150**, Dual-skid stylus pick-up for measurements on metal sheets and roller surfaces according to DIN EN 10049 (SEP)
KT007061P007	**Stylus pick-up PHT 6-350**
KT007061P008	**Stylus pick-up PHT 6-350, 5µm Probe Tip**, for measurements on flat planes, in bores from 6mm (0.24"), 17mm (0.67") deep and in grooves from 3mm (0.12") wide
KT007061P010	Measuring Stand ST-D
KT007061P012	Measuring Stand Mount - Required to fix the Elcometer 7061 to the measuring stand
KT007061P011	End Face Vee-Block - For measuring on flat faces of cylindrical and planar components
KT007061P013	Adapter Set for Transverse Tracing; Comprising of Adapter for Transverse Tracing and Vee-Block Holder with Vee-Block - For hand-held transverse tracing of cylindrical measuring objects
KT007061P016	**MarSurf PS1 Explorer Evaluation Software** Available as an optional accessory PS1 Explorer Evaluation Software allows the Elcometer 7061 to be connected to a PC or laptop; using the USB cable supplied to document protocol profiles, results, statistics and to print out all your measurement results.

How to use a Surface Roughness Tester

Surface Roughness Testers consist of a stylus which is mechanically drawn across the surface recording an "image" of the surface roughness across a pre-defined sample length.

The measurement technique provides a number of measurement parameters including:
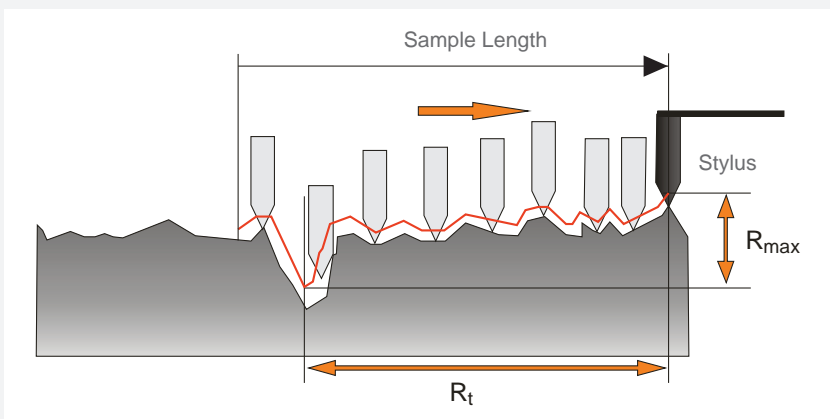
- **Rmax:** The greatest distance between the highest peak and lowest valley over the sampling length

- **Ra:** The average roughness over the sampling length

- **Rt:** The distance between the highest peak and the lowest valley within any given sampling length.

- **Rz:** The average distance between the highest peak and lowest valley over a number of sampling lengths

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Elcometer 130   Salt Contamination Meter

Soluble salts on a surface are absorbed into a special filter paper soaked with distilled water. The Elcometer 130 measures the conductivity of the wet paper, calculates the salt level and displays it in µg/cm².

- Suitable for a wide range of shapes, orientations, surfaces and finishes
- Quick and simple to use
- Portable and battery operated
- Confirms adequate cleaning of surfaces before coating, aiding the prevention of premature coating failure
- Shows salt build-up on vulnerable surfaces, which can be cleaned to increase the lifetime of a coating
- Test papers can be re-moistened and a similar test result can be achieved; ideal for proof and ISO requirements
- Accurate
- Repeatable
- Reproducible

STANDARDS:
SSPC Guide 15

Technical Specification   C

Part Number	Description	Certificate
E130----1	Elcometer 130 Salt Contamination Meter	○
Range	0.1 - 20µg/cm²	
Resolution	0.1µg/cm²	
Accuracy	±10%	
Operating Range	5°C - 40°C (41°F - 104°F) <80% RH	
Power Supply	9V Battery 6LR61 (MN1604)	
Number of Tests	Approximately 500 measurements before recharge	
Sample Time	2 minutes	
Sampling Size	110mm (4.3") circle, or part of	
Dimensions	290 x 200 x 80mm (11.4 x 7.9 x 3.1")	
Weight	1.5kg (3.3lb)	
Packing List	Elcometer 130 Salt Contamination Meter,100 x high purity test papers, 250ml (8.5fl oz) pure water, 8 x replacement plate support pads, 20 x PVC storage bags, disposable gloves, tissues, 3 x 2ml (0.06fl oz) syringes, plastic tweezers, plastic sample bottle, carry case and operating instructions	

Accessories

T99911344	Pure Water - 250ml (8.5fl oz) Bottle	
T1304469-	100 High Purity Test Papers	
T1304472-	Medical Wipes (1 Pack)	

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCE130----1 is the certificate for model E130----1).

SaltSmart™ Contamination Meter

Elcometer 146

The Elcometer 146 SaltSmart™ Contamination Meter is a light, handheld device for accurately measuring soluble salt content that has been flushed from an accurately measured area on the substrate to be tested. The meter uses conductivity to determine the amount of soluble salts present in the sample. The results can be displayed and stored in µS/cm, ug/cm2 or mg/m². No special calibration is required and the meter employs easy-to-use menu-driven processes to guide the user through various tasks.

Using the Elcometer SaltSmart™ test strips the Elcometer 146 SaltSmart™ Meter is a fast, easy to use alternative to the Bresle test and has been proven to be equivalent to ISO 8502-9. See below how to measure using the SaltSmart™ Contamination Meter.

STANDARDS:

NACE SP0508, IMO PSPC,
ISO 8502-9, SSPC,
US Navy 009-32 FY12

Technical Specification

Part Number	Description		
E146----1	Elcometer 146 SaltSmart™ Soluble Salt Contamination Meter		
Measuring Range	0-150µS/cm (0-155 mg/m²)	Resolution	1 µS (1.03 mg/m²)
Operating Temperature	0—50 °C (32—122 °F)	Accuracy	±1%
Temperature Coeffient	2.0 % per °C (F)		
Battery Type	2 AA Batteries; suitable for approx 100+ tests		
Sample Time	8 minutes for strip development, 15 seconds for meter analysis		
Sampling Size	20.6 x 15mm (309 mm²)		
Dimensions	160 x 80 x 30mm	Weight	1.2 kg (2.5 lb)
Packing List	Elcometer 146 SaltSmart™ Contamination Meter, Rubber Boot for SaltSmart™ Contamination Meter, USB Cable, SaltSmart™ Validation Strip , 2 x AA Batteries, Belt Pouch, Getting Started CD		

Accessories

T14623679	Elcometer 146 SaltSmart™ Contamination Test Strips (Pack of 10)
T14623680	Elcometer 146 SaltSmart™ Validation Strips (Pack of 1)
T14623681	Elcometer 146 Non-Residue Tape (Pack of 2)

Measuring salt contamination using the SaltSmart™ Contamination Meter

Taking care not to touch the white foam sensor, remove the protective packaging and place the de-ionized water bottle onto the SaltSmart™ test strip.

Place the test strip & bottle on to the substrate and hold in place with painters tape. On vertical surfaces, make sure that the red line on the test strip is horizontal - creating a 10° incline to allow water flow.

Whilst multiple test strips can be set up at the same time, after approximately 8 minutes remove each test strip in order from the surface.

Place the test strip into the SaltSmart™ meter, and read the value on the display.

Environmentally discard the test strip, bottle and tape.

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Elcometer 138

Bresle Salt Kit

It is essential that the level of contaminants on a surface is measured prior to application of the coating to ensure the quality of the coating and that its optimum lifetime is achieved.

If the coating is applied to a contaminated surface, which is not properly prepared, it could fail prematurely resulting in costly re-coating and high maintenance costs.

The Elcometer 138 Bresle Kit includes the Elcometer 138 Conductivity Meter. This lightweight, portable conductivity meter accurately measures the salinity of the test samples.

The cartridge type sensor can be easily replaced when necessary and displays conductivity (µS/cm and mS/cm) and salinity (%) on the digital display.

Features of the meter include indication of stability of reading indication.

STANDARDS:

AS 3894.6-A, IMO MSC.215 (82), IMO MSC.244 (83), ISO 8502-6, ISO 8502-9, SSPC Guide 15, US Navy NSI 009-32, US Navy PPI 63101-000

Technical Specification

Part Number	Description		
E138----1	Elcometer 138 Bresle Salt Kit		
Tests per Kit	25	Measurement Range	0 µS/cm to 19.9 mS/cm
Accuracy	2% full scale ±1 digit (at a depth of more than 10mS/cm, the range is 3% full scale ±1 digit)		
Dimensions	300 x 220 x 75mm (11 x 8.6 x 3")	Weight	2.1kg (4.62lb)
Packing List	Box of 25 x Elcometer Bresle patches, 250ml pure water in clear plastic bottle, 3 x 5ml (0.1fl oz) syringes, 3 x blunt needles, 30ml (1fl oz) plastic beaker, Elcometer 138 Conductivity Meter, 2 x CR2032 lithium batteries, 2 x standard solution (1.41 mS/cm), moistening solution, purified water, pipette, conductivity meter storage pouch, carry case and operating instructions		

Accessories

E135----B	Bresle Patches (Box of 25)	T13818519	Plastic Beaker 30ml (1fl oz)
T13818517	3 x 5ml (0.1fl oz) Syringes	T13818516	4 x Calibration Standards Solution
T13818518	3 x Needles	T99911344	Pure Water 250ml (8.5fl oz) Bottle

Measuring salt contamination using the Bresle method in accordance with ISO 8502-6/ISO 8502-9
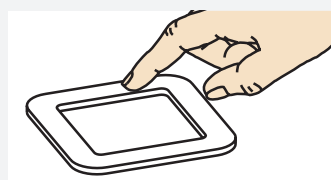
Remove protective backing and foam centre from the patch.

Apply the patch to surface and press firmly around perimeter to achieve a complete seal - ensuring that a minimum amount of air is trapped within the test compartment.
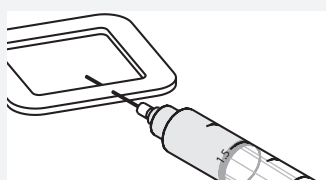
Insert syringe of 3ml of deionised water into the patch through its foam perimeter, at a 30° angle, so that it passes through the foam into the test compartment.

Inject 1.5ml of water into the test compartment.
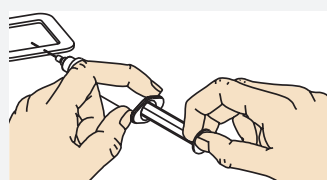
Reposition the needle and remove the remaining air within the compartment.

Remove the needle and syringe and hold the syringe with the needle pointing upwards and expel the air.

Insert the syringe needle into the patch and inject the remaining water.
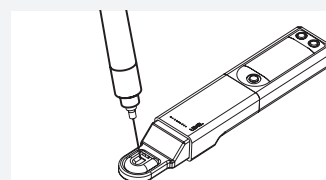
Withdraw and pull the solution back into the syringe and re-inject back into the patch.

Repeat at least four times and then extract as much solution as possible.

Remove the syringe from the patch and measure the conductivity of the solution using a suitable Conductivity Meter such as the Elcometer 138 on page 138.

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Bresle Sampler Patches

The Elcometer 135A Bresle Sampler is a self-adhesive rubber film patch with a sealed compartment for sampling of soluble impurities from steel surfaces with a suitable solvent. The Elcometer 135A Bresle Samplers are also part of the Elcometer 138/2 Surface Contamination Kit, see page 142.

STANDARDS:
ISO 8502-6

Technical Specification

Part Number	Description
E135----A	Elcometer 135 Bresle Sampler
Tests per Kit	50
Test Area	1250mm², 12.5cm² (1.93sq inches)
Sample Volume	2.6ml ± 0.6ml
Dimensions	52 x 52mm (2.0 x 2.0")

Bresle Patches

Elcometer 135B Bresle Patches are used to determine surface chloride contamination and are self-adhesive rubber film patches with a sealed compartment for sampling soluble impurities from steel surfaces with a suitable solvent.

Elcometer Bresle Patches are also available as part of the Elcometer 138 Bresle Salt Kit, see page 136.

STANDARDS:
ISO 8502-6

Technical Specification

Part Number	Description
E135----B	Elcometer 135 Bresle Patches
Tests per Kit	25
Test Area	1250mm², 12.5cm² (1.93sq inches)
Sample Volume	2.6ml ± 0.6ml
Dimensions	52 x 52mm (2.0 x 2.0")

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Elcometer 138

Conductivity Meter

Incorporating a flat sensor, the Elcometer 138 Conductivity Meter can measure the conductivity of a solution from a single drop of a sample.

Users can either place a sample on the meter's flat sensor or immerse the meter directly in the solution being tested, giving the meter a broad range of applications, for example, measuring rainwater pollution levels or the electric conductivity (EC) of solutions used in agricultural operations.

The Elcometer 138 Conductivity Meter also includes a convenient salinity conversion indicator. The meter can be directly immersed in solutions to take measurements, enabling convenient testing of such solutions as river water.

Features:
- Highly precise measurements can be obtained from a single-drop sample Waterproof flat sensor
- Automatic range switching gives a wide measurement range of 1µs/cm to 19.9mS/cm
- When the conductivity value is above 20mS/cm or the salinity is above 1.1%, the display will flash
- Battery Alarm when the battery is low
- The "°C" indicator light appears when the sample is below 5°C (41°F) or above 35°C (95°F)
- Displays Conductivity (µS/cm and mS/cm) and/or Salinity (%)

Technical Specification

Part Number	Description
T13818515	Elcometer 138 Conductivity Meter
Measuring Range	1µS/cm - 19.9mS/cm
Repeatability	±1% full scale
Ambient Temperature	5°C - 35°C
Accuracy	±2% full scale ±1 digit (over 10 mS/cm: ±3% full scale ±1 digit)
Dimensions	150 x 27 x 16mm (6 x 1 x 0.6")
Weight	47g (1.7oz)
Packing List	2 x bottles of standard solution (1.41mS/cm), bottle of de-ionised water, 2 x CR-2032 lithium batteries, pipette, storage pouch and operating instructions

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CSN Chloride, Sulphate & Nitrate Kit

Elcometer 134

The Elcometer 134 CSN Salt Kit is designed to accurately measure surface chloride, sulphate and nitrate ions in minutes and offers a single kit solution for testing in the field.

All the components of the Elcometer CSN Test Kits are pre-measured and pre-dosed for trouble free testing.

Results are recorded in parts per million (ppm) requiring no complicated calculations. Elcometer 134 CSN tests are all designed to use a ratio of 1:1 for easy conversion to µg/cm².

Supplied in an ABS plastic carry case for easy portability around the site, each field kit is supplied with full instructions attached to the inside lid, together with:
• 5 x Chloride tests
• 5 x Sulphate tests, together with 1 x colorimeter, for sulphate testing
• 5 x Nitrate test strips
• 5 x Syringes (without needles)

Refill kits are available for all consumables.

STANDARDS:
ISO 8502-5, ISO 8502-11, SSPC Guide 15

Technical Specification

Part Number	Description
E134-CSN	Elcometer 134 CSN Chloride, Sulphate & Nitrate Test Kit
Measuring Range	0 - 100µg/cm² (0 - 100ppm)
Scale Resolution	1µg/cm² (1ppm)
Sample Time	1 - 5 minutes (approximately)
Storage Temperature	Not exceeding 25°C (77°F)
Dimensions	360 x 320 x 140mm (14.2 x 12.6 x 5.5")
Weight	1.76kg (3.8lb)
Packing List	5 x tests (containing: 5 x chloride tests, 5 x nitrate test strips, 5 x sulphate tests, 5 x syringes), 1 x colorimeter, carry case and operating instructions

Accessories

T134---C	1 set of 5 Nitrate Tests
T134-KIT	Refill Kit for Elcometer 134 CSN

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ELCOMETER 224
SURFACE PROFILE GAUGE

Accurate, repeatable and faster than ever before.

Now measures on flat or convex surfaces

From surface profile to climate monitoring, dry film thickness to data management; Elcometer combines high quality products with simple data management, producing professional inspection reports at the click of a button.

Surface Profile	**Climate Monitoring**	**Coating Thickness**	**ElcoMaster™ 2.0**
The Elcometer 224 digital surface profile gauge, available as either integral or separate probe versions, is faster than ever before.	The Elcometer 319 dewpoint meter records all the critical climate parameters for the coating's professional: surface, air & dewpoint temperatures, %RH & ΔT.	Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.	ElcoMaster™ 2.0 is the simple yet powerful software solution; combining all your inspection results instantly in one professional report.
See page 120	See page 150	See page 182	See page 264

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Chloride Ion Test Kit for Surfaces

Elcometer 134S

Chloride salts left on the surface before the first coat is applied can result in the coating system being forced off the surface by corrosion or blistering before the full life of the coating has been reached. To ensure that the chloride has been removed it is essential that the surface is tested before the coating is applied.

Elcometer 134S test method: a latex sleeve is filled with a Chlor*Rid extract solution and stuck to the test surface where the solution is worked against the surface to extract the salts. The titration tube is inserted and the results can be recorded.

STANDARDS:
ISO 8502-5, SSPC Guide 15

Technical Specification

Part Number	Description
E134----1	Elcometer 134S Salt Detection Kit for Blast Cleaned Surfaces
Measuring Range	1 - 60µg/cm² (1 - 60ppm)
Scale Resolution	1µg/cm² (1ppm)
Tests per Kit	4
Dimensions	185 x 125 x 110mm (7 x 5 x 4.5")
Weight	250g (9oz)
Packing List	4 x test kits each containing: titration tube snapper, strap, clip, pre-measured bottle of Chlor*Rid extract solution, sleeve, titration tube and operating instructions

For Chloride Ion Test Kits for water and abrasives see pages 116 - 117

How to use a Chloride Ion Test Kit for Surfaces
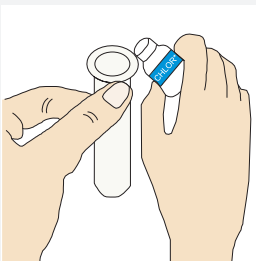
1. Remove cap from CHLOR*EXTRACT solution bottle and pour entire contents into the test sleeve.
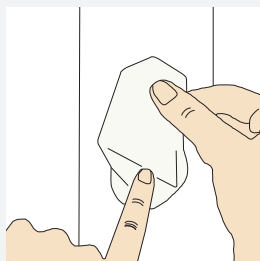
2. Firmly apply test sleeve to test surface, allowing extract solution to come into contact with test surface.
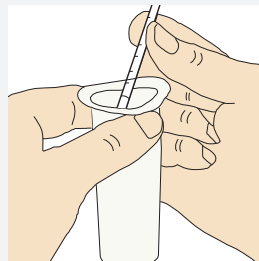
3. Insert the titration tube into the test sleeve.
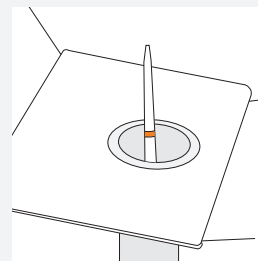
4. Insert sleeve with extract solution and titration tube into the hole previously made in the box lid and wait 1½ minutes.
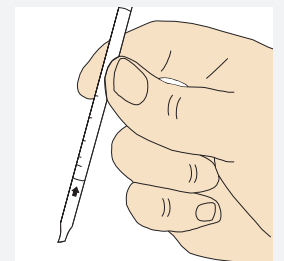
5. Immediately remove and read the number on the titration tube at the interface of the colour change. Pink is normal, white is the chloride level.

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Elcometer 138/2

Surface Contamination Kit

Measuring the level of contaminants on a surface prior to application of the coating is essential to ensure the quality of the coating and that its optimum lifetime is achieved.

If the coating is applied to a contaminated surface, which is not properly prepared, it could fail prematurely resulting in costly recoating and high maintenance costs.

The Elcometer 138/2 Surface Contamination Kit provides the user with a means for testing invisible surface contaminants including:

*   pH
*   chloride ions
*   iron
*   salts

STANDARDS:
AS 3894.6-A, AS 3894.6-D, SSPC Guide 15

Technical Specification

Part Number	Description
E138----2	Elcometer 138/2 Surface Contamination Kit
Measuring Range	pH: 0pH to 14pH Iron: 3,10, 25, 50, 100, 250, 500mg/l Fe² Chloride: 30- 600µg/cm² (30 - 600ppm) Cl
Dimensions	300 x 220 x 75mm (11 x 8.6 x 3")
Weight	2.1kg (4.62lb)
Packing List	100 x pH test strips, 100 x Iron test strips, 40 x Chloride test strips, 50 x Bresle samplers, 3 x 5ml (0.2fl oz) syringes, 3 x needles, 30ml (1fl oz) plastic beaker, carry case and operating instructions

Accessories

E135----A	Bresle Sampler (Box of 50)
T13818517	3 x 5ml (0.1fl oz) Syringes
T13818518	3 x Needles
T13818519	Plastic Beaker, 30ml (1fl oz)
T99911344	Pure Water, 250ml (8.5fl oz) Bottle
T13820562	100 x pH Test Strips
T13820563	100 x Iron Test Strips
T13820564	40 x Chloride Test Strips

Chloride Test Strips

Chloride ions on a steel surface increase the probability that corrosion of the steel will take place even if a protective coating is applied. Chloride ions trapped under a coating in the presence of steel and moisture will form a corrosion cell. This corrosion process will result in premature failure of the protective coating and may cause blistering of coatings in immersion service.

The chloride test strips will indicate the concentration of chloride ions in the sample solution and if the area of sample collection and the volume of water is known the concentration can be measured in parts per million or micrograms per millilitre.

Technical Specification	
Part Number	Description
T13820564	40 x Chloride Test Strips

Iron Test Strips

Ferrous ions are an indicator of the corrosion of steel as they are formed when the iron oxidises as a result of a corrosion cell formed between the steel and oxygen in the presence of water. The ferrous ion test strips will also indicate the concentration of ferrous ions in a sample solution in the same ways as the chloride strips.

Technical Specification	
Part Number	Description
T13820563	100 x Iron Test Strips

pH Test Strips

These strips will determine if a solution or surface is acid or alkaline in nature. Acids form when certain gases are dissolved in water, for example chlorine in water produces hydrochloric acid, carbon dioxide in water produces carbonic acid, sulphur dioxide in water produces sulphuric acid all of which are corrosive to steel.

The presence of these contaminants can either be detected in a solution washed from the surface or by putting a wet ph Test Strip on to the dry surface. pH does not measure the concentration but it does indicate how acidic or alkaline the surface is. Alkaline surfaces are normally associated with either concrete surfaces that are to be coated or steel re-enforcement bars buried in concrete.

Technical Specification	
Part Number	Description
T13820562	100 x pH Test Strips

elcometer®

Elcometer 148

pH Tester

pH is the measure of acidity of a liquid. The pH scale ranges from 0 to 14pH - where 0pH is acidic and 14pH is alkaline. This simple, easy to use instrument measures both pH and temperature using a single sensor.

In many industries, pH measurement is critical to the correct performance of processes. pH is temperature dependent thus the temperature of the sample under test will affect the pH value recorded.

The Elcometer 148 sensor has automatic temperature compensation, ensuring like-for-like measurements can be taken for meaningful comparison of the results.

The condition of the sensor is automatically monitored after each successive calibration and sensors can be easily replaced by the user as and when required.

- Simultaneously displays pH and temperature.
- Measurement hold / freeze function.
- Record maximum and minimum readings over a series of tests.
- °C / °F user switchable.
- Waterproof to IP57 and floats on water.
- Auto power off.
- Battery level indicator.

STANDARDS:
ASTM E 70

Technical Specification

Part Number	Description	
H148----1	Elcometer 148 pH Tester	
	pH	Temperature
Range	0 to 14pH	0 to 89ºC (32 to 192ºF)
Resolution	0.01pH	0.1ºC (0.1ºF)
Accuracy	±0.03pH	±0.5ºC (±1ºF)
Battery	4 x 1.5v AAA	
Calibration	3 point at 7pH, 4pH and 9pH	
Dimensions	195 x 40 x 36mm (7.7 x 1.6 x 1.42")	
Weight	150g (5.3oz)	
Packing List	Elcometer 148 pH Tester, pH/Temperature sensor, 4 x AAA batteries, wrist strap, 4pH calibration sachet, 7pH calibration sachet and operating instructions.	

Accessories

T14821766	pH/Temperature Sensor
T14821768-1	4pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821768-2	7pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821768-3	9pH Buffer Solution for Calibration: Capsules, Pack of 10
T14821767-1	4.01pH Buffer Solution for Calibration: 100ml Bottle
T14821767-2	7pH Buffer Solution for Calibration: 100ml Bottle
T14821767-3	10.01pH Buffer Solution for Calibration: 100ml Bottle

elcometer®

ISO 8502-3 Dust Tape Test Kit

The Elcometer 142 Dust Tape Test kit allows assessment of the quantity and size of dust particles on surfaces prepared for painting. Dust on blast cleaned surfaces can reduce coating adhesion, leading to premature coating failure and sub-standard coating finish.

Used in conjunction with the Elcometer 145 Dust Tape Roller the kit can be used in accordance with the recommendations of BS EN ISO 8502-3 either as a pass/fail test or as a permanent record of the presence of dust. Supplied in a carry case for use in the field to assess surface cleanliness.

STANDARDS:
AS3894.6-C, IMO MSC.215 (82), IMO MSC.244 (83), ISO 8502-3, US Navy PPI 63101-000

Technical Specification

Part Number	Description		
E142----1	Elcometer 142 ISO 8502-3 Dust Tape Test Kit		
Measuring Range	Chart with dust classes ranging from 0 - 5 with descriptions for accurate class placement		
Dimensions	210 x 297mm (8.27 x 11.69")	Weight	250g (9oz)
Packing List	Microscope with 10x magnifier, 2 batteries (LR14), graticule, adhesive tape to specification ISO 8502-3, comparator display board, dust assessment plate, test record sheets (pack of 25) and operating instructions		

Accessories

T14219451	Test Record Sheet
T14219454	Display Board
T14223003	Adhesive Tape 1 Roll Pack
T14219525	Dust Assessment Plate

Dust Tape Roller

The Elcometer 145 Dust Tape Roller is used in conjunction with the Elcometer 142 Dust Tape Test kit to assess the quantity and size of dust particles on surfaces prepared for painting.

The Dust Tape Roller presses the Elcometer 142 Dust Tape to the surface using a controlled constant force as required by BS EN ISO 8502-3 (BS 7079-B3:1993).

new

Technical Specification

Part Number	Description		
E145----1	Elcometer 145 Dust Tape Roller		
Load Exerted	39.2 to 49.0 N, (8.8 and 11.0 lbF) when spring fully depressed		
Dimensions	160 x 70 x 110mm (6.3 x 2.76 x 4.33")	Weight	615g (21.7oz)

elcometer®

Elcometer 139

Amine Blush Swab Test Kit

When using amine cured epoxy resin coatings in a multi-layer system, if the original coating cures in a low ambient temperature and/or in a high humidity environment, problems - referred to in the industry as amine blush can develop. The presence of amine blush can lead to inter-coat adhesion failures if the film is re-coated.

The Elcometer 139 Amine Blush Swab Test Kit is a rapid colorimetric test designed solely for the use in the quick and immediate qualitative identification of amine blush (carbamates) on the surface of coatings using surface swabs. The presence of amine blush is indicated by a visual change of colour of the test solution when compared with a control sample.

new

Technical Specification

Part Number	Description		
E139----A	Amine Blush Swab Test Kit		
Dimensions	172 x 110 x 100mm (6.75 x 4.25 x 4.00")	Weight	350g (12.3oz)
Packing List	20 x Polystyrene Sampler Test Tubes of 1.0ml (0.035fl oz) buffer solution, 1 x Test tube of Diluent Part A solution, 1 x Test tube of Diluent Part B solution, 2 x Diluent Transfer Pipettes, 3 x Test Part A dropper bottles - containing ACh-E powder (freeze dried), 3 x Test Part B dropper bottles - containing ATC powder (freeze dried), 1 x Test Part C dropper bottle - containing Chromogen DTNB solution,1 x Bottle of Swab Solution - containing 25ml (0.89fl oz) of rubbing alcohol (70% IPA), 20 x Cotton Swabs (q-tips), 2 x Swab Templates - 2.54 x 2.54cm (1 x 1"), 1 x Pair of Tweezers, 1 x Re-sealable plastic bag for content disposal 1 x User Guide.		

Elcometer 139

Amine Blush Chip Screen Test Kit

The Elcometer 139 Amine Blush Chip Screen Test Kit is a rapid colorimetric test designed solely for the use in the quick and immediate qualitative identification of amine blush (carbamates) on the surface of coatings using small chips or shavings. The presence of amine blush is indicated by a visual change of colour of the test solution when compared with a control sample.

The Elcometer 139 determines whether amine blush is or is not present on the coating's surface.

new

Technical Specification

Part Number	Description		
E139----C	Amine Blush Chip Screen Test Kit		
Dimensions	172 x 110 x 100mm (6.75 x 4.25 x 4.00")	Weight	310g (10.9oz)
Packing List	20 x Polystyrene Sampler Test Tubes of 1.0ml (0.035fl oz) buffer solution, 1 x Test tube of Diluent Part A solution, 1 x Test tube of Diluent Part B solution, 2 x Diluent Transfer Pipettes, 3 x Test Part A dropper bottles - containing ACh-E powder (freeze dried), 3 x Test Part B dropper bottles - containing ATC powder (freeze dried), 1 x Test Part C dropper bottle - containing Chromogen DTNB solution, 1 x Scissors 1 x Re-sealable plastic bag for content disposal, 1 x User Guide.		

Accessories

T13923546	Test Tube Stand

Amine Blush Swab Test Kit

How to use an Amine Blush Swab Test Kit
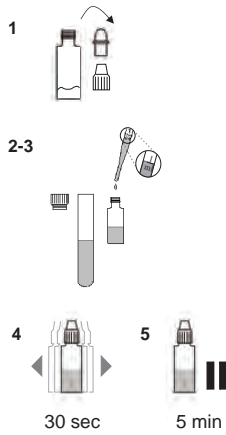
Test Part A (green)

1. Remove the green bottle cap and dropper tip from the Test Part A bottle

2. Using the 1ml marker as a guide, remove 1ml of Part A Diluent - green capped tube, using the appropriately colour coded transfer pipette

3. Add the 1ml Diluent into the appropriateTest Part A bottle

4. Replace the dropper tip and bottle cap and shake the diluted Test Part A bottle moderately for about 30 seconds.

5. Wait at least 5 minutes before using the prepared Test Part A Solutions.

Test Part B (blue)
Follow steps 1-5 above using the blue colour coding
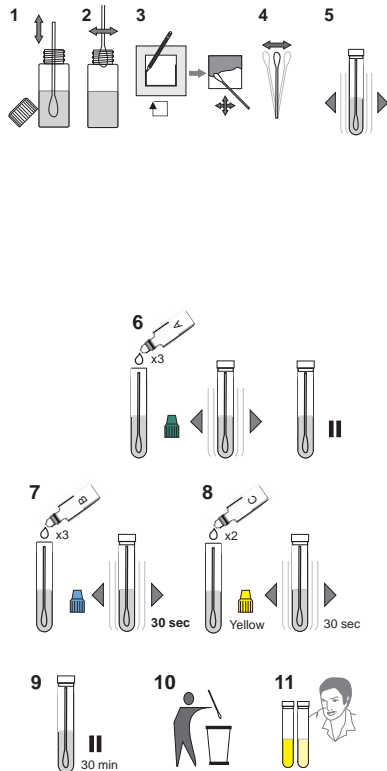
1. Dip the cotton portion of a Cotton Swab (q-tip) into the Swab Solution bottle

2. Remove excess by rolling cotton tip on the inside of the bottle

3. For each sample, using the Swab Template as a guide, swab a 2.5 x 2.5cm (1 x 1") area

4. Wave the Cotton Swab in the air until dry (about 2 minutes)

5. Place the Cotton Swab into a Sampler Test Tube, replace the top and shake for 30 seconds

6. Add 3 drops of Test Part A (green cap), shake for 30 seconds and incubate (rest) the sample for 30 minutes at room temperature 10 - 30°C (50 - 86°F), avoiding direct sunlight.

7. Add 3 drops of Test Part B(blue cap), shake for 30 seconds

8. Add 2 drops of Test Part C (yellow cap), shake for 30 seconds

9. Incubate (rest) the sample for 30 minutes at room temperature, avoiding direct sunlight

10. Remove and environmentally dispose of the Cotton Swab

11. Visually compare the results to the control sample within 10 minutes of test completion:

    Amine blush is present if there is a detectably lower intensity of yellow colour observed in the test sample as compared to the control sample.

elcometer®

ELCOMETER 280
PULSED HOLIDAY DETECTOR

Making pulsed DC holiday detection safer, easier and more reliable

Rugged, shockproof and water resistant, the Elcometer range of DC, Pulsed DC, and Low Voltage Holiday Detectors are designed to meet the most exacting specifications. Ergonomic features and interchangeable probes make Elcometer's range the most versatile in the industry.

Pinhole Detection

The Elcometer 270 sets the standard for wet sponge detectors - high quality, low voltage detectors with a range of accessories to meet your requirements.

See page 222

DC Holiday Detection

The Elcometer 266 High Voltage DC holiday detector's menu allows access to every major International Standard and automatically sets the required parameters.

See page 228

Pulsed Holiday Detection

The new Elcometer 280 Pulsed DC holiday detector with three grounding options makes pipeline inspection faster and safer than ever before.

See page 224

Adaptors & Accessories

Elcometer offers a wide range of versatile accessories designed to meet every application and adaptors to work with your current brushes and probes.

See page 232

RH	% Relative Humidity
Ts	Surface Temperature
Ta	Ambient Air Temperature
Td	Dewpoint Temperature
TΔ	Difference between Td and Ts
Tdb	Dry Bulb Temperature
Twb	Wet Bulb Temperature
Te	External Temperature
SH	Specific Humidity

Climatic Testing

Climatic Conditions, Oven Profiling & Moisture Measurement

The monitoring of climatic conditions - such as temperature, relative humidity, dewpoint and moisture - in industry is often vital to the success of the application of a coating. These parameters determine both the conditions for the application of the coating, and the resulting quality and performance of the coated product.

Climatic Conditions: Elcometer offer a complete range of dewpoint and relative humidity meters, thermometers, dataloggers, moisture meters and anemometers to monitor climatic conditions.

In the protective coatings industry, moisture can form on the surface when the surface temperature is low enough to cause condensation from the atmosphere. The Dewpoint temperature (Td) is the point at which this occurs.

Monitoring the surface temperature (Ts) relative to the air temperature (Ta) and its relative humidity (%RH) allows the dewpoint temperature to be calculated and compared to the surface temperature. This difference in temperature (TΔ) is the key parameter dictating when it is safe to apply the coating.

The continuous monitoring of the climatic conditions during the cure process (drying) is required. If the temperature is too high, the coating can dry too quickly, leading to surface defects. If the temperature is too low, the cure time is extended, leading to delays in applying a further coat, other types of surface defects may affect the further coat, such as amine blush.

Oven Temperature Profiling: The cure process for powder coating requires a specific temperature to be achieved for a specific period.

Monitoring the oven profile allows the user to ensure that the product is brought to the appropriate temperature and held at that temperature for the specified time. If the oven or product is too hot, the coating can burn, if it is too cold, the coating does not cure, leading to poor adhesion and appearance.

Moisture Measurement: The presence of moisture within a material will result in poor adhesion, premature coating failure and poor appearance. For example, applying a powder coating to a damp wooden panel will cause steam to be created when the panel passes through the curing oven, thus causing damage to the coating.

elcometer®

Elcometer 319   **Dewpoint Meter**

STANDARDS:
BS 7079-B4, IMO MSC.215(82),
IMO MSC.244(83), ISO 8502-4,
US Navy NSI 009-32,
US Navy PPI 63101-000

A hand-held Dewpoint meter
with manual and interval data
logging in one gauge

Integrated magnets allow
remote data monitoring on steel
substrates

Stores 25,000 records in up
to 999 batches

USB and Bluetooth® data
output to a PC or PDA

Dustproof and waterproof
gauge with fully sealed
sensors (equivalent to IP66)

Large easy to read measurements in
degrees °C or °F

View up to 5 user selectable statistics
on screen
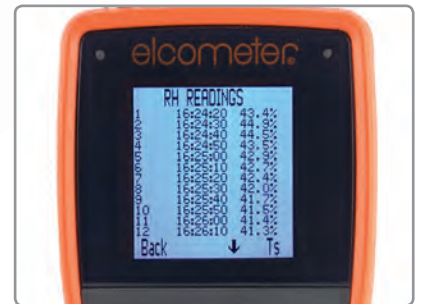
Review individual readings

elcometer®

Elcometer 319

Easy to use, intuitive
multi-lingual menu structure

supplied with
ElcoMaster™ 2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 154

Measure and record climatic parameters:
- Relative humidity
- Air temperature
- Surface temperature
- Dewpoint temperature
- TΔ (the difference between
  surface temperature and dewpoint)
- Dry Bulb temperature
- Wet Bulb temperature
- External temperature correction (K-type)
- Specific Humidity

Large, customer definable
illuminated display operates over
the full temperature range

Visual and audible indication of
user defined limits against any or
all parameters

This rugged gauge is designed to measure
and record all relevant climatic parameters
required to determine whether the conditions
are suitable for painting.

T_s T_a T_d T_Δ RH SH T_{db} T_{wb} T_e

elcometer®

Elcometer 319   Dewpoint Meter

Accurate

- Meets ISO 8502-4
- Rapid response time
- Each instrument is supplied with a Calibration Certificate
- Readings are switchable between Celsius and Fahrenheit
- Each set of readings is time & date stamped

Simple

- Easy menu-driven user interface in multiple languages
- Clear, illuminated display showing up to five parameters
- Arrow indicators show temperature trends

Flexible

- The gauge can be used as either a hand-held Dewpoint meter or as a remote data logging monitor[†]
- Integrated K-Type connector allows measurement of surface temperature during remote logging
- Selecting the "Te" mode transforms the gauge into a simple thermometer - ideal for measuring a coating's temperature prior to application or other external temperatures (Te)
- Hold/freeze function allows manual readings to be taken and reviewed before being logged into the memory

STANDARDS:
BS 7079-B4, IMO MSC.215(82),
IMO MSC.244(83), ISO 8502-4,
US Navy NSI 009-32,
US Navy PPI 63101-000

supplied with
ElcoMaster™2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 154

Paperless Quality Assurance with the
ElcoMaster™ suite of products, see page 264

[†] Top models only

Dewpoint Meter

Durable

- Manufactured from temperature resistant materials ensuring safe use in climates ranging between -20°C (-4°F) and +80°C (+176°F)

- Waterproof and dust proof rating equivalent to IP66

- The rugged and ergonomic design extends to include durable industrial sensors ideal for harsh environments

- The instrument's clear illuminated display operates over its full temperature range

Versatile

- Data can be downloaded to a PC via USB or Bluetooth® and evaluated using ElcoMaster™ 2.0 Software†

- Each gauge can be powered by either 2 AA batteries (for up to 400 hours# use) or directly via the USB cable

- Adjustable limits can be set for each measurement parameter which triggers visual and audible alarms whenever a limit is exceeded - even if it is not displayed on the screen

Te - ideal for use as a simple thermometer

Remote monitoring of climatic parameters

Waterproof and rugged to IP66

The Elcometer 319 Dewpoint Meter can be used as a hand-held gauge or a stand alone data logger - ideal for monitoring climatic conditions over a period of time.

Based on 1 reading per hour in logging mode.

Elcometer 319   Dewpoint Meter

Technical Specification   C

Model	Standard Gauge	Top Gauge	
Part Number	G319----S	G319----T	
Reading Parameters - RH, Ta, Ts, Td, TΔ, Tdb, Twb[1], SH[1]	■	■	
Statistics - number of readings, standard deviation, mean, coefficient of variation, minimum, maximum	■	■	
Dustproof & Waterproof Gauge with Fully Sealed Sensors - equivalent to IP66	■	■	
Integral Magnets - secure the gauge during logging	■	■	
High/Low Limits - audible, visual, red/green LED alarms can be set against any or all parameters	■	■	
Multilingual Menus	■	■	
Backlight - user selectable	■	■	
K-Type Connector for External Measurement	■	■	
Memory - with reading and statistic review	Last 10 records	25,000 records in 999 batches	
Manual Logging	■	■	
Interval Logging[2]		Adjustable between 1 second and 1 hour	
USB and Bluetooth Wireless Data Output		■	
ElcoMaster™ 2.0 & ElcoMaster™ Mobile Software		■	
Certificate	●	●	

	Temperature Range	Accuracy	Resolution
Gauge#	-40 to +200°C (-40 to +392°F)	±0.5°C (±1°F)	0.1°C (0.1°F)
Air Temperature (Ta)	-20 to +80°C (-4 to +176°F)	±0.5°C (±1°F)	0.1°C (0.1°F)
Surface Temperature (Ts)	-20 to +80°C (-4 to +176°F)	±0.5°C (±1°F)	0.1°C (0.1°F)
External K-Type Thermocouple (Te)	-20 to +80°C (-4 to +176°F)	±0.5°C (±1°F)*	0.1°C (0.1°F)
Relative Humidity (RH)	0 to 100%RH	±3%RH	0.1%
Gauge & LCD Operating Range	-20°C to +80°C (-4°F to +176°F)		
Power Supply	2 x AA 1.5V Batteries or via USB Cable		
Battery Life	Manual Mode: Greater than 40 hours (Backlight Off) Interval Logging: up to 400 hours (1 reading every 10 minutes)		
Dimensions	180 x 75 x 35mm (7 x 3 x 1.4")		
Weight	300g (0.66lb)		
Packing List	Elcometer 319 Dewpoint Meter, 2 x AA batteries, wrist strap, carry case, calibration certificate, USB cable+, ElcoMaster™ 2.0+ and operating instructions		

Do not expose the gauge to temperatures outside the gauge and LCD operating range
* Accuracy ±2°C (4°F) with K Type probes supplied by Elcometer. Probes supplied by other manufacturers may vary.
+ Top Model only

[1]Calculated Value
[2]With Part Number T31920162

Accessories

T31920162	Magnetic Surface Temperature Probe; -40 to +200°C (-40 to +392°F)
T9996390-	Liquid Temperature Probe; -200 to +1100°C (-328 to +2012°F)
T99921325	USB Cable
T99916063	Wrist Strap
T99923480	Protective Carry Case/Pouch

● Certificate supplied as standard.

elcometer®

Digital Hygrometers

The **Elcometer 308 Hygrometer** has been specifically designed for use in very hot climates where the surface temperature of the substrate can exceed the paint manufacturer's recommended limits for successful painting.

Painting outside recommended limits can have a detrimental affect on the performance and lifetime of the coating. The Elcometer 308 Hygrometer provides a simple and fast measurement of relative humidity and surface temperature.

The **Elcometer 309 Delta T Hygrometer** provides a simple and fast measurement of the two critical climate parameters within coatings:

- Delta T (TΔ): The difference between the surface temperature (Ts) and the dewpoint temperature (Td). When TΔ is less than 3ºC (5ºF) painting should not occur.
- Relative Humidity (RH): This is the amount of water vapour taken up by air. Expressed as a percentage, RH is dependent on the air temperature.

Elcometer 308   Elcometer 309

STANDARDS:
BS 7079-B4 (Elcometer 309),
ISO 8502-4 (Elcometer 309)

Technical Specification   C

Model	Elcometer 308 Hygrometer	Elcometer 309 Delta T Hygrometer
Part Number	G308----1	G309----1
	Ts RH	TΔ RH
Operating Range	-20ºC to +80ºC (-4 ºF to +176ºF)	-20ºC to +80ºC (-4 ºF to +176ºF)
Air Temperature (TΔ)		-20ºC to +80ºC (-4 ºF to +176ºF)
Surface Temperature (TS)	-20ºC to +80ºC (-4 ºF to +176ºF)	-20ºC to +80ºC (-4 ºF to +176ºF)
Relative Humidity (RH) & Accuracy	0% to 100% RH (±3%)	0% to 100% RH (±3%) (Default upper limit 75%, user adjustable)
Resolution	0.1ºC (0.1ºF) / 0.1%	0.1ºC (0.1ºF) / 0.1%
Power Supply	2 x AA 1.5V Batteries or via USB Cable	2 x AA 1.5V Batteries or via USB Cable
Battery Life	Greater than 40 hours (Backlight off)	Greater than 40 hours (Backlight off)
Certificate	●	●
Dimensions & Weight	180 x 75 x 35mm (7 x 3 x 1.4") 300g (10.6oz)	180 x 75 x 35mm (7 x 3 x 1.4") 300g (10.6oz)
Packing List	Elcometer 308 Hygrometer, wrist strap, 2 x AA batteries, protective carry case/pouch with belt clip, RH & surface probe calibration certificate and operating instructions.	Elcometer 309 Delta T Hygrometer, wrist strap, 2 x AA batteries, protective carry case/pouch with belt clip, RH probe calibration certificate and operating instructions.

Accessories

T99923480	Protective Carry Case/Pouch
T99921325	USB Cable
T99916063	Wrist Strap
TCAL-308F	Optional Full Calibration Certificate

● Basic calibration certificate supplied as standard.

Elcometer 116

Whirling & Sling Hygrometers

These instruments are designed to determine the dewpoint and relative humidity at any given time.

The Elcometer 116A Whirling Hygrometer is available in Celsius scale only. A guide for Relative Humidity (RH) determination is supplied with each instrument and the dewpoint can accurately be obtained using the Elcometer 114 Dewpoint Calculator.

The Elcometer 116C Sling Hygrometer, shown as the black unit in the photograph, is a convenient, self contained instrument with an inbuilt slide rule for the calculation of %RH and dewpoint. It has spirit filled thermometers and is available in °C or °F scales.

STANDARDS:
ASTM E 337-B, BS 2842

- Manual operation
- Spirit filled thermometers

T_{db} T_{wb} RH

Technical Specification

Part Number	Description		
G116A---1	Elcometer 116A Whirling Hygrometer - Metric °C		
G116C---1	Elcometer 116C Sling Hygrometer - Metric °C		
G116C---2	Elcometer 116C Sling Hygrometer - Imperial °F		
Measuring Range	-5°C to 50°C (23°F to 122°F)		
Dimensions	17 x 22mm (6.9 x 10")	Weight	300g (0.6lb)
Packing list	Elcometer 116 Whirling Hygrometer or Elcometer 116 Sling Hygrometer, slide rule table and operating instructions		

Accessories

T1164441-	Elcometer 116A Spare Thermometer (°C)	T1164442-	Elcometer 116A Spare Thermometer - °F
T1164478-	Elcometer 116C Spare Thermometer (°C)	T1164479-	Elcometer 116C Spare Thermometer - °F
T1164487-	Elcometer 116A Wicks (Pack of 5)	T11600212	Elcometer 116A Replacement Slide Rule
T1164480-	Elcometer 116C Wicks (Pack of 4)		

Elcometer 114

Dewpoint Calculator

This provides accurate values of Dewpoint and Relative Humidity (RH) from the wet and dry bulb temperatures measured by a Whirling or Sling Hygrometer.

The range of the Elcometer 114 is -10°C to 50°C (14°F to 122°F) and has an accuracy of ±1% with respect to standard tables.

Technical Specification

Part Number	Description
G114----2	Elcometer 114 Dewpoint Calculator

Magnetic Thermometers

The Elcometer 113 Magnetic Thermometer continuously indicates the surface temperature of steel and other magnetic material.

The thermometers are based on a bimetallic strip and therefore do not require batteries but do require time to adjust to the temperature.

The Elcometer 113 is available in a number of scale ranges and as an economy version.

Ts

Technical Specification

Part Number	Description	Scale Range
G113----1	Elcometer 113 Magnetic Thermometer	-35°C to 55°C
G113----2	Elcometer 113 Magnetic Thermometer	0°C to 120°C
G113----3	Elcometer 113 Magnetic Thermometer	-20°C to 250°C
G113----4	Elcometer 113 Imperial Magnetic Thermometer	0°F to 500°F
G113----1B	Elcometer 113 Economy Magnetic Thermometer	-35°C to 55°C
G113----2B	Elcometer 113 Economy Magnetic Thermometer	0°C to 120°C
Dimensions	15 x 19 mm (0.5 x 0.7")	
Weight	56g (1.9oz)	
Packing List	Elcometer 113 Magnetic Thermometer, protective pouch and operating instructions	

Paint Thermometer

It is often important to ensure the temperature of the coating to be applied is at a temperature which will ensure a suitable application.

The Elcometer 210 Paint Thermometer is supplied with a clip to enable the thermometer to be hooked on to the edge of a paint can allowing accurate temperature measurement of the paint.

Ts

Technical Specification

Part Number	Description
G210----1	Elcometer 210 Paint Thermometer
Scale Range	-40°C to 70°C (-40°F to 160°F)
Dimensions	300mm (12") length with a 45mm (1¾") dial
Weight	34g (1.2oz)
Packing List	Elcometer 210 Paint Thermometer

elcometer®

Elcometer 212

Digital Pocket Thermometer

The Elcometer 212 is a digital, pocket size thermometer ideal for day to day use.

Incorporating a fast response stainless steel liquid or surface probe, the Elcometer 212 provides temperature readings in under four seconds.

Housed in a water resistant case with integrated rubber seals and a moulded flush window, preventing dirt and leaks damaging the LCD display, the Elcometer 212 is ideal for use in the harshest of environments.

The probe conveniently folds back into the side of the instrument, preventing damage when not in use.

- Liquid or surface probe options available
- User switchable between °C and °F
- Resolution can be set to 0.1°C (0.1°F) or 1°C (1°F)

Ts

Technical Specification

Part Number	Description
G212----1A	Elcometer 212 Digital Pocket Thermometer with Liquid Probe
G212----2A	Elcometer 212 Digital Pocket Thermometer with Surface Probe
Measuring Range	-49.9°C to +299.9°C (-58°F to +572°F) user selectable
Operating Temperature	-20 to 50°C (-4 to 58°F)
Resolution	0.1°C (0.1°F) or 1°C (1°F) user selectable
Accuracy	±0.4°C (±0.7°F) up to 199.9°C (392°F), ±1°C (±1.8°F) above 199.9°C (392°F)
Probe	K-type Thermocouple
Display	14mm LCD
Battery Type	2 x CR2032 lithium coin cell
Battery Life	Approximately 1500 hours
Auto Switch Off Time	10 minutes
Case Dimesions	19mm x 47mm x 153mm (0.7" x 1.9" x 0.7")
Weight	97g (3.4oz)
Packing List	Elcometer 212 Digital Pocket Thermometer with batteries fitted and operating instructions

Digital Waterproof Thermometer

Elcometer 213/2

The Elcometer 213/2 Digital waterproof thermometer offers the latest microprocessor technology, superior durability and is designed for reliability and ease of use.

Features:
•   Rubber bumper seals for impact resistance
•   Waterproof case (IP66 & IP67 protection)
•   Extruded aluminium case for superior durability
•   °C/°F switchable
•   Easy to read LCD display

Probes are available to purchase separately.

| Ts | Te |

Technical Specification   C

Part Number	Description	Certificate
G213----2	Elcometer 213/2 Digital Thermometer*	○
Operating Range†	-49°C to +1372°C (-56°F to 2500°F)	
Accuracy	±1% of the reading ±1 digit	
Resolution	0.1°C (0.1°F) up to 299.9°C (572°F), 1°C (1°F) above 299.9°C (599.9°F)	
Battery Life	5,000 hours	
Power Supply	1 x MN1604/PP3 (9V) battery	
Dimensions	35 x 60 x 115mm (1.4 x 2.4 x 4.5")	
Weight	194g (0.42lb)	
Packing List	Elcometer 213/2 Digital Waterproof Thermometer, battery, carry case and operating instructions	

*Probes are not supplied as standard with the Elcometer 213/2; please select from the list below
† Operating range is dependent on probe used

Accessories

T9991728	Magnetic Surface Probe,13mm Diameter (0.51)	Range: -50°C to 150°C (-58°F to 302°F)
T2136069-	Surface Probe,130 x 4.2mm Diameter (5.11 x 0.17")	Range: -50°C to 600°C (-58°F to 1112°F)
T9996390-	Liquid Probe,130 x 3mm Diameter (5.11 x 0.12")	Range: -50°C to 850°C (-58°F to 1562°F)
T2136391-	Needle Probe, 130 x 3mm Diameter (5.11 x 0.12")	Range: -50°C to 400°C (-58°F to 752°F)

Other probes available on request. Contact Elcometer for further information.

Magnetic
T99911728

Liquid
T9996390-

Surface
T2136069-

Needle
T2136391-

○ Certificate available as optional extra. Order as a separate line item adding the pre-fix QC to the Part Number e.g. ordering part number QCG213----2 would purchase a calibration certificate for the model G213----2.

elcometer®

Elcometer 214L

IR Digital Laser Thermometer

The Elcometer 214 is a simple, easy to use, non contact thermometer which safely and accurately measures surface temperature of non-reflective materials using infrared technology.

With a user switchable measuring range -35°C to 365°C or -31°F to 689°F, a digital display of the temperature is produced in less than one second.

- Non-contact technology with laser spot indicator
- °C / °F user switchable
- Fast, 1 second scanning of any surface
- Measure objects as small as 25mm (1")
- Distance-to-Target Ratio of 8:1
- Easy to read LCD display

The Elcometer 214 IR Digital Laser Thermometer has a D/T ratio (Distance-to-Target) of 8:1 and measures the emitted energy from a target spot one-eighth the size of the working distance.

As can be seen in the diagram below, if the distance from the sensor optics to the target is 200mm (8") for example, the diameter of the measured area is 25mm (1").

Ts

Technical Specification

Part Number	Description		
G214L----3	Elcometer 214 Infared Digital Laser Thermometer		
Measuring Range	-35°C to 365°C (-31°F to 689°F)		
Ambient Temperature	0 to 50°C (32 to 122°F)		
Resolution	0.2°C (0.5°F)		
Accuracy	±1.5°C (2.7°F)		
Distance-To-Target	8:1, 25mm (1") spot size		
Emissivity	Fixed at 0.95		
Response Time	1 second		
Battery Type	2 x LR03 (AAA)	Battery Life	14+ hours continuous use
Dimension	166 x 34 x 64 (6.5 x 1.3 x 2.5")	Weight	113g (3.98oz)
Packing List	Elcometer 214 Infared Digital Laser Thermometer, 2 x AAA batteries (fitted), wrist strap and operating instructions		

Digital Laser Thermometer

Spot Size

| 100mm (4") | 200mm (8") | 300mm (12") |

Distance to Target

| 800mm (32") | 1600mm (64") | 2400mm (96") |

elcometer®

Climate Monitoring System

Elcometer 320

The Elcometer 320 is a powerful system which accurately and remotely monitors climatic parameters in up to 254 locations.

STANDARDS:
BS 7079-B4, IMO MSC.215(82), IMO MSC.244(83), ISO 8502-4, US Navy NSI 009-32, US Navy PPI 63101-000

supplied with
ElcoMonitor™ climate software
see page 162

Each red, yellow, green signal tower has an integrated alarm which provides both visual and audible warnings for up to two measurement parameters

Remotely monitor and record climatic parameters:
• Relative humidity
• Air temperature
• Surface temperature
• Specific humidity
• TΔ (the difference between surface temperature and dewpoint)

The Elcometer 320 can also be used as a stand alone environmental warning station - ideal for single zone monitoring

Up to 254 monitoring stations can be set up remotely either by Bluetooth® or over an Ethernet TCP/IP connection

Ta Ts TΔ RH SH

Remote Climate Monitoring System

Bluetooth® ETHERNET
Administrator   Monitors 1 ... n
Station 1   Station 2   Station 3   Station 254
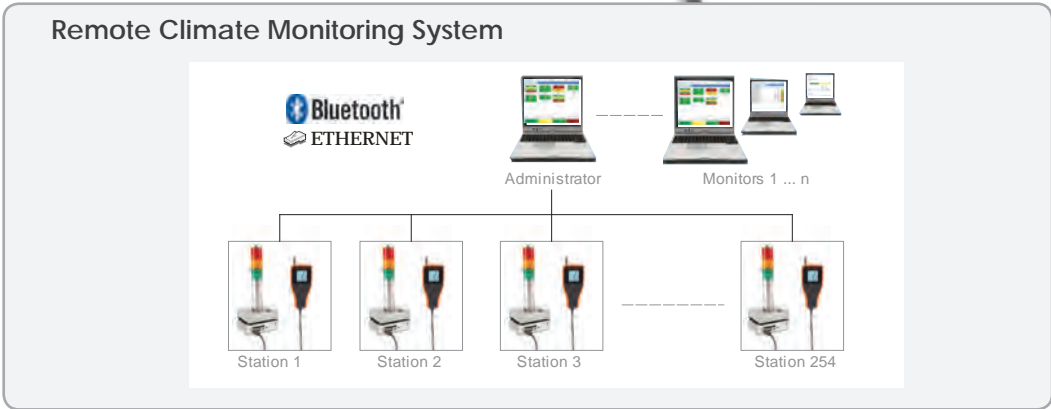
elcometer®

Elcometer 320   Climate Monitoring System
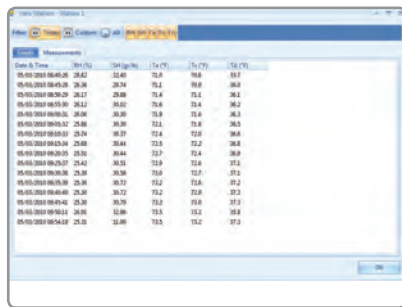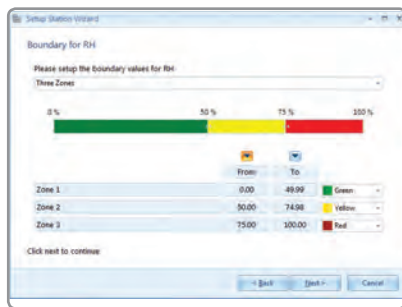
The Elcometer 319 is connected to a signal tower and alarm via an embedded PC which is connected to the control and monitoring computers via standard Ethernet TCP/IP or by Bluetooth® for remote monitoring.

Through the simple use of the internationally recognised red, yellow, green traffic light sequence, ElcoMonitor™ allows Quality Managers to see, at a glance, the environmental conditions of up to 254 locations from the comfort of their office chair.

ElcoMonitor™ software incorporates set up wizards which guide the User through the initial set up of each Elcometer 320 Monitoring Station. Once a station has been assembled and switched on, ElcoMonitor™ searches for all the active monitoring stations.

Each station can be set up remotely using ElcoMonitor™ Software.

Station set ups include:
- Which two climate parameters to be used for each station
- User definable red, yellow and green warning limits
- Flashing red light additional warning parameter
- Data recording frequency
- Warning buzzer alarm duration

Username and passwords are used to ensure that only approved administrators can amend the set up of each station.

All measurement values (RH, SH, Ta, Ts, TΔ) from each station are transmitted back to ElcoMonitor™ allowing remote investigation of all the environmental conditions.

Individual reports for each monitoring station can be generated from within ElcoMonitor™ or archived in spreadsheet form for further analysis.

Technical Specification   C

Elcometer ElcoMonitor™ Monitoring System:	Certificate
Part Number	G320-1 ●
Measuring Parameters	RH, SH, Ta, Ts, TΔ
Connectivity	Ethernet TCP/IP Network or BlueTooth® The embedded PC will automatically connect to a wired TCP/IP network with DHCP, which will allocate it an IP address
Number of Stations	Maximum of 254 individual Elcometer 320 stations can be connected
Embedded PC	eBox 3300-JSK with 2 x RS232 connections - or equivalent
Central PC Requirements	Minimum Requirement of Windows XP with 1 GB RAM and 1GB free HD; 1024 x 768 Screen Resolution; Connection to the same Ethernet TCP/IP network as monitoring stations - preferably on the same subnet; Bluetooth connections can be made via an integrated or USB Bluetooth®
Packing List	Elcometer 319 Top Dewpoint Meter with calibration certificate, Light and audible alarm system with power supply, Elcometer 320 Climate Monitoring System Base Unit and power supply, Flash Card, Connection cables, ElcoMonitor™ Log and ElcoMonitor™ View Software, Bluetooth USB dongle

● Certificate supplied as standard.

elcometer®

Anemometer

Elcometer 410

The Elcometer 410 Anemometer is a portable, pocket size instrument for taking accurate readings of wind speed.

The lightweight impeller with high precision jewel bearings provides very accurate airflow measurements even at low speeds. The impeller can easily be replaced without the need to return the unit to Elcometer.

The wind speed can be displayed in various measurement units; indicating current speed, maximum speed or average speed.

Technical Specification

Part Number	Description	
G410-1	Elcometer 410 Anemometer	
Functions	Current wind speed (3 second average) Average speed since power on (AVG) Maximum 3 second gust since power on (MAX) Data Hold	
Measurement Units	Knots (kt), metres per second (m/s), kilometres per hour (km/h), miles per hour (mph), feet per minute (ft/min) and Beaufort Force (B)	
Operating Range	0.4m/s to 60m/s (0.8 to 135.0mph)	
Specification Range	0.4m/s to 40m/s (0.8 to 89.0mph)	
On-axis Accuracya	±3% of reading or least significant digit, whichever is the greater	
Off-axis Response	-1% at 5º, -2% at 10º, -3% at 15º	
Calibration Drift	<1% after 100 hours operation at 7m/s	
Resolution	0.1 kt, m/s, km/h, mph. 1 ft/min below 1999 ft/min, 10 ft/min above 2000 ft/min. 1 Beaufort (0 to 12)	
Operating Temperature	-10ºC to +55ºC (14ºF to 131ºF)	
Storage Temperature	-30ºC to +60ºC (-22ºF to 140ºF)	
Power Supply	1 x CR2032 Lithium Coin Cell	
Battery Life	Approximately 300 hours	
Auto Switch Off	45 minutes after last key press	
Dimensions	Instrument Only: Instrument and Protective Cover:	122 x 42 x 20mm (4.8 x 1.6 x 0.8") 122 x 46 x 26mm (4.8 x 1.8 x 1")
Weight	Instrument Only: Instrument and Protective Cover:	65g (2.3oz) 102g (3.6oz)
Packing List	Elcometer 410 Anemometer, protective cover, lanyard, 1 x CR2032 battery and operating instructions.	

Accessories

T41021404	Portable Mini Tripod (including Tripod Clamp)
T41021405	Tripod Clamp (Securely holds the Elcometer 410 and will fit any standard tripod)
T41021406	Replacement Impeller

elcometer®

Elcometer 215   **Oven Data Logger**

The Elcometer 215 is an easy to use oven data recorder, used to measure and store the temperature profiles of both the sample and the oven during the cure process. Both the thermal barrier and heat sink are constructed from stainless steel.

Specifically designed for powder or liquid coating batch and conveyor ovens

Measure temperature both horizontally and vertically as the component is passed through the cure process

Ideal in situations where powder coated thickness is inconsistent

Measures up to 6 temperatures at one time

Start and stop logging at a pre-set temperature

Memory stores up to 260,000 readings, or 8 production runs

Variable measurement interval, date, time, °C / °F

Display the results of every stored reading, including Cure-Index

Large multilingual menu-driven display for easy operation

Oven Data Logger
Elcometer 215

Flexible evaluation of data

- Quick display - the logger display shows maximum temperature and Cure-Index figure, percentage and pass/fail sign, as a value or graphic representation for each probe
- Logger to printer - a complete, full-colour report can be printed directly to any HP printer using the optional link.
- Extensive analysis - comprehensive calculations and fully customisable reports are easily produced as each system is supplied with the powerful data analysis software. See page 167 for details.

Simple 3-step operation for basic features:
1. Place the probes on the product and switch on
2. Place the logger in the box and send it through the oven
3. Read the results from the display or send them to a printer or PC

Elcometer 215 Temperature Probes

A wide range of K-Type temperature probes is available with 1.5m (4'9"), 3m (9' 8") or 6m (19' 7") cable length. The Elcometer 215 can be used with a combination of up to 6 probes simultaneously and feature:

- Perfect contact between probe and surface
- Low mass and optimised shape to avoid influence on temperature of sample
- Extremely strong, highly flexible and easy to clean Teflon ® coated cables

- **Air temperature probe** - available with either a clamp or magnet

Clamp air probe

- **Clamp surface probe** - small, elegant surface probe for any type of material

Clamp surface probe

- **Magnetic Surface probe** - suitable for use on magnetic surfaces, this probe has a PTFE coated grip for safe removal from the substrate with a flexible metal probe arm
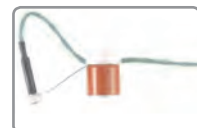
Magnetic surface

- **Combined Clamp / Magnetic Air and Surface probe** - a versatile probe, especially useful when a variety of magnetic and non magnetic samples is being used

Combined probe

Probe Identification Tags

Available as an accessory, these brass tags are an effective way of identifying the probes attached to the data logger. Each tag is 27mm (1") in diameter and has a nickel plated 100mm (3.94") steel chain, numbered 1 - 6

Probe ID Tags

Each Teflon coated high temperature resistant probe cable is easy to clean after each run

elcometer®

Elcometer 215   Oven Data Logger

Technical Specification   C

Part Number	Description	Certificate
G215----2S	Elcometer 215 Oven Data Logger, Standard Kit	○
G215----2T	Elcometer 215 Oven Data Logger, Top Kit	○
Temperature Range	-200°C to 1300°C (-328°F to 2372°F)	
Accuracy	5°C to 500°C: ±0.5°C, >500°C: ±1.0°C (41°F to 932°F: ±1.0°F; > 932°F: ±2.0°F	
Operating Temperature	-30°C to 65°C (-22°F to 149°F)	
Resolution	0.1°C (0.2°F)	
Measuring Intervals	Adjustable from 8 per second to 1 per hour	
Memory	260,000 readings or 8 production runs	
Power Supply	2 x AA batteries	
Data Output	USB / PCL3	
Dimensions	153 x 101 x 23mm (6 x 4 x 0.9")	
Weight	450g (15.8oz)	

	Standard Kit	Top Kit
Thermal Characteristics	Thermal Barrier without Heat Sink	Thermal Barrier with Heat Sink
	100°C (212°F) for 140 minutes 150°C (302°F) for 80 minutes 200°C (392°F) for 60 minutes 250°C (482°F) for 50 minutes	100°C (212°F) for 340 minutes 150°C (302°F) for 195 minutes 200°C (392°F) for 130 minutes 250°C (482°F) for 100 minutes
Dimensions	245 x 245 x 115mm (9.65 x 9.65 x 4.5")	
Weight	4kg (8.8lb)	6kg (13.2lb)
Packing List	Elcometer 215 Oven Data Logger, thermal barrier (Standard Kit), thermal barrier with heat sink block (Top Kit), Elcometer 215 Software, USB cable, carry case, 2 x AA batteries and operating instructions	

Probes

	1.5m (4'9")	3m (9'8")	6m (19'7")
Clamp Air Probe	T21521275	T21521276	T21521277
Magnetic Air Probe	T21521287	T21521288	T21521569
Clamp Surface Probe	T21521278	T21521279	T21521280
Magnetic Surface Probe	T99921281	T99921282	T99921283
Magnetic, Clamp Air & Surface Probe	T21521284	T21521285	T21521286

Accessories

T21521241	Probe Identification Tags (Pack of 6)
T21521222	Thermal Barrier for Elcometer 215 Standard Kit
T21521217	Thermal Barrier for Elcometer 215 Top Kit (Heat Sink Block not included)
T21521219	Heat Sink Block for Elcometer 215 Top Kit
T21521220	Data Logger to PC USB Cable
T21521221	Data Logger to HP Printer Cable

○ Certificate available as optional extra. Order as a separate line item adding the pre-fix QC to the Part Number e.g. ordering part number QCG215----2T would purchase a calibration certificate for the model G215----2T.

elcometer®

Oven Data Logger Software

The Elcometer 215 Oven-Logger is supplied with software which has been designed specifically for the powder and paint cure processes.

Features include:
- Informs you immediately after the process whether the paint is sufficiently cured or if the process has failed
- 5 languages - English, French, German, Spanish and Italian
- Cure specifications from the powder supplier can be applied with upper and lower limits
- Important information, such as the thermostat settings, track speed, type of paint, client data etc. can be added to print a complete quality report
- Connects to an HP printer for immediate results

A User Settings Wizard is incorporated, making it easy to add fields such as sample rate, paint type, temperature units, cure specification, probe names, date and time.

It is easy to create your own paint library, complete with cure specifications.

The Download Logger Wizard makes downloading data easy.

The Outgoing Mail configuration, enables any report to be quickly emailed. All reports produced can be personalised to show your name, address, logo and website automatically.

Advanced calculation functions combined with enhanced process files make it possible to evaluate every part of the cure process and quickly judge the oven performance. Adjustments, such as line speed or oven temperature, can then be made.

Each batch of data can be viewed and analysed in various formats.
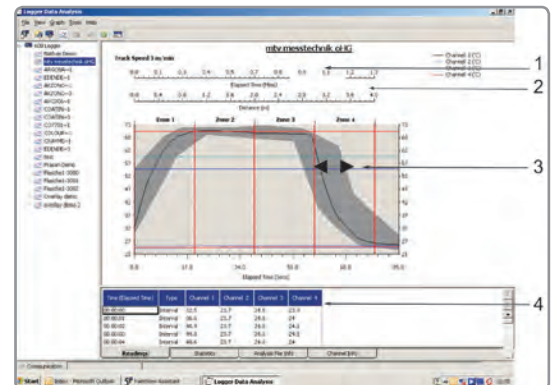
1. Track speed of conveyer line
2. Elapsed time in the oven
3. Temperature tolerance band statistics
4. Temperature readings and statistics

1. Insert company logos or photographs of the component
2. Select either a quick report, or configure a custom report via this Wizard

Using an Over Data Logger

Monitoring the oven profile allows the user to ensure that the product is brought to the appropriate temperature and held at that temperature for the specified time. If the oven or product is too hot, the coating can burn, if it is too cold, the coating does not cure, leading to poor adhesion and appearance.

Not all components are alike, and are rarely of a uniform density. This means that the oven temperature settings, if not adjusted to suit the component being coated, may over and/or under heat a component – leading to coating burn and/or curing issues of the powder coating.

Whilst the instrument used is known as an oven logger, it is not the oven temperature per se, that is the critical measurement, but the temperature across the whole of the component.

An oven logger is a data logging device with several connections for thermocouples which are in turn attached to key areas of the component. The instrument is placed in an insulated box to protect it from the high temperatures and passes together with the component through the oven, recording the temperature profile throughout the process.

elcometer®

Elcometer 7410 & 7420 — Pinless Moisture Meters

The Elcometer 7410 is an accurate and easy to use non-invasive instrument for non-destructive measurement of moisture content of concrete.

The electrodes transmit parallel low frequency signals, calibrated to give average moisture content by comparing the change in impedance between damp and acceptably dry concrete.

- Calibrated ready for use on concrete
- Instant readings on a clear, easy to read scale
- Fully portable, battery operated and non-destructive

Technical Specification

Part Number	Description		Certificate
K0007410M001	Elcometer 7410 Concrete Moisture Meter		●
Measuring Range	Concrete 0 - 6%, Floor screed 0-10%		
Substrate Type	Concrete, gypsum floor screed		
Measurement Depth	12.5mm (0.5")		
Dimensions	155 x 85 x 43mm (6.1 x 3.3 x 1.7")	Weight	298g (10.5oz)
Power Supply	9V PP3 battery (6F22 (PP3) type)		
Packing list	Elcometer 7410 Concrete Moisture Meter, battery, carry case, calibration certificate and operating instructions		

Elcometer 7420 — Digital Moisture Meter

Handy and easy to use, the Elcometer 7420 does not use pins and therefore does not damage the substrate under test.

The gauge is placed on to the material to be evaluated and quickly indicates the degree of moisture in concrete, fibreglass or wood, to a depth of 30mm (1.2")

- Uses high frequency methods
- Digital display with moisture/dry comparison scale
- No damage to the surface

Technical Specification

Part Number	Description		
K0007420M001	Elcometer 7420 Digital Moisture Meter		
Dimensions	150 x 80 x 30mm (6 x 3.1 x 1.4")	Weight	298g (10.5oz)
Power Supply	9V PP3 battery (6F22 [PP3] type)		
Packing List	Elcometer 7420 Digital Moisture Meter, carry case, battery and operating instructions		

● Certificate supplied as standard.

elcometer®

Compact Moisture Meter

Elcometer 7400

The natural feel of the Elcometer 7400 makes it easy to use, allowing the pins on the end of the instrument to be pressed into the material to be measured.

The thin pins allow easy measurement of the moisture content of sawn timber, chipboard and fibreboard materials up to a maximum thickness of 25mm (0.98") as well as normal gypsum and mixed plaster.

- Completely automatic instrument setting
- No separate electrodes or leads required
- Handy, quick and pocket-size for fast measurements
- Correction for two groups of wood species
- Measurement of plaster moisture content with a direct readout in percentage of dry weight
- Uses the conductivity measurement method

Technical Specification

Part Number	Description
K0007400M018	Elcometer 7400 Compact Moisture Meter
Measuring Range	Large 3-digit LCD readout Wood 5 to 20% moisture content for wood with correction for two groups of wood species. Plaster 0.3 to 3.5% moisture content for plaster
Substrate Type	Sawn timber, chipboard, fibreboard, gypsum, plaster
Dimensions	190 x 75 x 30mm (7.4 x 3.0 x 1.0")
Weight	180g (6.35oz)
Power Supply	9V dry cell or rechargeable battery (6F22 (PP3) type)
Packing List	Elcometer 7400 Compact Moisture Meter, 9V PP3 battery, spare pins, protective cap and operating instructions

Types of Moisture Meters

On porous materials such as concrete, plaster, brick, wood, the moisture content of the substrate should be measured, as the presence of moisture within a material will result in poor adhesion, premature coating failure and poor appearance.

It is not sufficient to simply ensure that the surface is dry as often the surface of the substrate is the driest point – due to evaporation. It is important to establish the moisture content within the substrate itself.

When powder coating wooden panels, for example, if the wood (or mdf) has too high a moisture content, as the panel passes through the oven, the moisture is heated, generating steam – and causing significant coating finish issues.

Applying a coating to a concrete floor which is too damp can cause premature adhesion failure. Moisture meters have been developed to specifically determine the level of moisture in a substrate and come in two forms:

Pin-type moisture meters: Invasive pins are pushed firmly into the surface of the substrate being measured and, by measuring the electrical resistance between the pin electrodes provide the percentage moisture content (%MC) in the substrate.

Pinless, contact-type moisture meters: Whilst pinless meters typically measure moisture content faster and are non destructive they do require a relatively flat surface because the sensors are mounted on the base of the gauge making them ideal for concrete.

elcometer®
inspection equipment

ELCOMETER 456
COATING THICKNESS GAUGE

More accurate, repeatable and faster than ever before.

From surface profile to climate monitoring, dry film thickness to data management; Elcometer combines high quality products with simple data management - producing professional inspection reports at the click of a button.

Surface Profile	Climate Monitoring	Coating Thickness	ElcoMaster™ 2.0
The Elcometer 224 digital surface profile gauge, available as either integral or separate probe versions, is faster than ever before.	The Elcometer 319 dewpoint meter records all the critical climate parameters for the coating's professional: surface, air & dewpoint temperatures, %RH & ΔT.	Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.	ElcoMaster™ 2.0 is the simple yet powerful software solution; combining all your inspection results instantly in one professional report.
See page 120	See page 150	See page 182	See page 264

Wet Film Thickness

When applying a liquid coating, by measuring the uncured film thickness, it is possible to determine the eventual dry film thickness. Applying too much coating wastes time and materials. It can also affect the performance and finish of the product.

Too much wet film can cause the coating to crack as it cures; too little coating increases the risk that the substrate will not be sufficiently protected, leading to rust spots.

The three non-destructive methods for measuring wet film thickness are:

- Wet Film Combs
- Pfund Thickness Gauges
- Wet Film Wheels

In each case, the thickness of the coating is measured and the dry film thickness can be estimated using the coating's solid : wet ratio.

Using a wet film comb
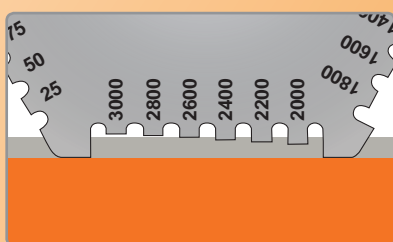
Place a comb perpendicular to and touching the substrate. Hold the comb in position and wait a few seconds until the teeth are wet. Remove the comb from the film.
The wet film thickness lies between the biggest value 'coated' or 'wet' tooth and the smallest value 'uncoated' or 'dry' tooth.

Using a wet film wheel
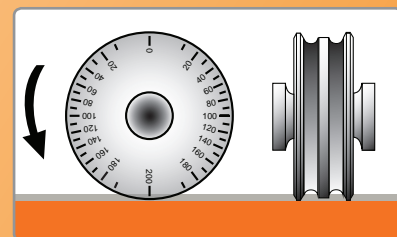
Roll the wheel through a wet coating, the centre wheel eventually touches the film. This point on the scale indicates the thickness. When the volume to solids ratio of the coating is known, generally found on a product data sheet, the wet film thickness can be used to predict the dry film thickness.
Roll from maximum to minimum to avoid a false reading caused by surface tension

elcometer®

Elcometer 112 & 3236   Hexagonal Wet Film Combs

These hexagonal precision formed stainless steel wet film combs are long lasting and reusable and are supplied in a range of thicknesses measuring up to 3000µm (120mils).

These six sided combs vary in size, giving either 24 or 36 measurement steps, depending upon the comb, thus providing increased accuracy.

STANDARDS:
ASTM D 4414-A, AS/NZS 1580.107.3, BS 3900-C5-7B, ISO 2808-1A, ISO 2808-7B, JIS K 5600-1-7, NF T30-125, US Navy PPI 63101-000, US Navy NSI 009-32

Technical Specification   C

Part Number	Range	Values	Certificate
K0003236M201	20 - 370µm	20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 150, 170, 190, 210, 230, 250, 270, 290, 310, 330, 350, 370µm	○
K0003236M202	25 - 2000µm	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000µm	○
B112----1B	25 - 3000µm	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 1000, 1100, 1200, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000µm	○
K0003236M203	0.5 - 15mils	0.5, 0.75, 1.0, 1.25, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 8, 9, 10, 11, 12, 13, 14, 15mils	○
K0003236M204	1 - 80mils	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55, 60, 65, 70, 75, 80mils	○
B112----2B	1 - 120mils	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 120mils	○
Dimensions and Weight	Elcometer 3236M201 / M203	53 x 50 x 1mm (2.09 x 1.97 x 0.04"), 10g (0.35oz)	
	Elcometer 3236M202 / M204	77 x 90 x 1mm (2.95 x 3.54 x 0.04"), 22g (0.77oz)	
	Elcometer 112	75 x 65 x 1mm (2.95 x 2.54 x 0.04"), 20g (0.7oz)	
Packing List	Wet Film Comb, storage case and operating instructions		

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003236M201 is the certificate for model K0003236M201).

elcometer®

Punched Aluminium Wet Film Combs

These punched aluminium combs offer the user a low cost method of measuring the wet film thickness.

The Elcometer 112AL, being punched from aluminium, is not as accurate as precision formed stainless steel wet film combs and has a shorter lifespan.

Supplied in a pack of 10 combs, each comb has Metric (25 - 3000µm) on one side and Imperial (1 - 118mils) on the other.
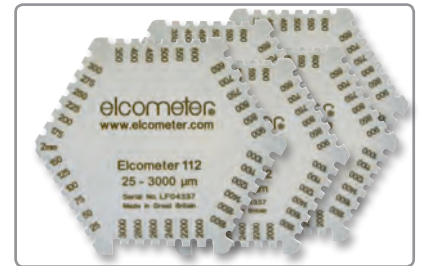
STANDARDS:

ASTM D 4414-A, AS/NZS 1580.107.3, BS 3900-C5-7B, ISO 2808-1A, ISO 2808-7B, JIS K 5600-1-7, NF T30-125, US Navy PPI 63101-000, US Navy NSI 009-32

Technical Specification

Part Number	Description
B112AL12473-3	Elcometer 112AL Aluminium Wet Film Comb* (Pack of 10)
Dimensions	75 x 65 x 1mm (2.95 x 2.56 x 0.04")
Weight	90g (3.17oz)
Packing List	Elcometer 112AL (Pack of 10) and operating instructions

* The Elcometer 112AL can be customised with your logo. Please contact Elcometer for further details.

Wet Film Combs

These reusable precision stainless steel combs are made to be long lasting and are supplied with either Metric and Imperial measurements.

Four separate thickness ranges are available up to a maximum of 1270µm or 50mils and are manufactured to an accuracy of 5% or 2.5µm (0.01mil), whichever is the greater.

Each comb has 10 measurement steps (teeth).

STANDARDS:

ASTM D 4414-A, AS/NZS 1580.107.3, BS 3900-C5-7B, ISO 2808-1A, ISO 2808-7B, JIS K 5600-1-7, NF T30-125, US Navy PPI 63101-000, US Navy NSI 009-32

Technical Specification

	Metric Combs				Imperial Combs		
Part Number	Range	Comb Steps	Certificate	Part Number	Range	Measurement Steps	Certificate
B11529455M	20 – 325µm	20, 35, 50, 75, 100, 125, 175, 225, 375, 325µm	○	B11529451E	1 – 13mils	1, 1.5, 2, 3, 4, 5, 7, 9, 11, 13mils	○
B11529456M	50 – 450µm	50, 75, 100, 150, 200, 250, 300, 350, 400, 450µm	○	B11529452E	2 – 18mils	2, 3, 4, 6, 8, 10, 12, 14, 16, 18mils	○
B11529457M	50 – 750µm	50, 100, 150, 200, 250, 350, 450, 550, 650, 750µm	○	B11529453E	2 – 30mils	2, 4, 6, 8, 10[†], 10[†], 15, 20, 25, 30mils	○
B11529458M	125 – 1250µm	125, 250, 375, 500, 625, 750, 875, 1000, 1125, 1250µm	○	B11529454E	5 – 50mils	5, 10, 15, 20, 25, 30, 35, 40, 45, 50mils	○
B1152959WM	-	Set of 4 Combs	○	B1152959WE	-	Set of 4 Wet Film Combs	○

† Two 10mil values, one on each edge of the comb

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Elcometer 3238

Long Edge Wet Film Combs

These stainless steel combs are wire eroded to provide an accuracy of ± 2.5μm (0.01mil) and are supplied with either Metric or Imperial measurements.

Each comb has 24 measurement steps (teeth) providing a more accurate wet film thickness value.

STANDARDS:
ASTM D 4414-A, AS/NZS 1580.107.3, BS 3900-C5-7B, ISO 2808-1A, ISO 2808-7B, JIS K 5600-1-7, NF T30-125, US Navy PPI 63101-000, US Navy NSI 009-32

Technical Specification   C

Metric Combs				Imperial Combs			
Part Number	Range	Comb Steps	Certificate	Part Number	Range	Comb Steps	Certificate
K0003238M201	5 – 120μm	5μm	○	K0US3238M201	0.5 – 6mils	0.5mil	○
K0003238M202	25 – 600μm	25μm	○	K0US3238M202	1.0 – 24mils	1.0mil	○
K0003238M203	50 – 1200μm	50μm	○	K0US3238M203	2 – 48mils	2.0mil	○
K0003238M204		Set of 3 Combs	○	K0US3238M204		Set of 3 Combs	○

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003238M201 is the certificate for model K0003238M201).

Elcometer 154

Plastic Wet Film Combs
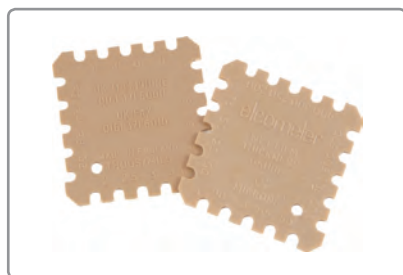
The Elcometer 154 Wet Film Combs are made from ABS plastic and are designed to be used once and kept as a record of wet film thickness measurement for quality assurance or customer requirements.

Metric and Imperial values are on the same comb, 50 to 800μm on one side, 2 to 32mils on the other.

Supplied in a pack containing 500 combs. Each comb has 16 measurement steps.

STANDARDS:
BS 3900-C5-7B, ISO 2808-1A, ISO 2808-7B, JIS K 5600-1-7, NF T30-125

Technical Specification

Part Number	Description
B154----1	Elcometer 154 Plastic Wet Film Combs (Pack of 500)
Dimensions	40 x 40mm (1.57 x 1.57")
Weight	900g (2lb)
Packing List	Elcometer 154 Wet Film Combs (Pack of 500) and operating instructions

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Wet Film Wheels

Elcometer 3230

The Elcometer 3230 Wet Film Wheel is a high precision, accurate and easy to use instrument which consists of a set of three wheels. The central wheel is of a smaller diameter and is eccentric relative to the two outer wheels. By rolling the gauge through a wet coating, the centre wheel eventually touches the film. This point on the scale indicates the thickness.

A convenient mounting handle for the wheel is available in two lengths; 15cm (6") & 50cm (19"); please order separately.

When the volume to solids ratio of the coating is known (generally found on the product data sheet supplied by the manufacturer), the wet film thickness can be used to predict the dry film thickness.

Several measurement ranges between 0 to 25µm and 0 to 3000µm (0 to 1mil and 0 to 40mils) are available.

- Continuous scale produces ±5% measurement accuracy
- Suitable for flat and curved surfaces

STANDARDS:
ASTM D 1212-A, AS/NZS 1580.107.3, BS 3900-C5-7A, ISO 2808-1B, ISO 2808-7A, JIS K 5600-1-7, NF T30-125

Technical Specification   C

Metric Film Wheels				Imperial Film Wheels			
Part Number	Range	Graduations	Certificate	Part Number	Range	Graduations	Certificate
K0003230M001	0 - 25µm	1.25µm	○	K0US3230M001	0 - 1mil	0.05mil	○
K0003230M016	0 - 40µm	2.0µm	○	-	-	-	○
K0003230M002	0 - 50µm	2.5µm	○	K0US3230M002	0 - 2mils	0.10mil	○
K0003230M003	0 - 100µm	5.0µm	○	K0US3230M003	0 - 4mils	0.20mil	○
K0003230M004	0 - 150µm	7.5µm	○	K0US3230M004	0 - 6mils	0.25mil	○
K0003230M005	0 - 200µm	10.0µm	○	-	-	-	○
K0003230M006	0 - 250µm	12.5µm	○	-	-	-	○
K0003230M007	0 - 300µm	15.0µm	○	K0US3230M005	0 - 12mils	0.50mil	○
K0003230M008	0 - 400µm	20.0µm	○	-	-	-	○
K0003230M009	0 - 500µm	25.0µm	○	K0US3230M006	0 - 20mils	1.0mil	○
K0003230M010	0 - 1000µm	50.0µm	○	K0US3230M007	0 - 40mils	2.0mils	○
K0003230M015	0 - 1500µm	75.0µm	○	-	-	-	○
K0003230M011	0 - 2000µm	100µm	○	-	-	-	○
K0003230M012	0 - 3000µm	150µm	○	-	-	-	○
Dimensions	50 x 30mm (1.97 x 1.18")			Weight	220g (7.76oz)		
Packing List	Wet Film Wheel, storage case and operating instructions						

Accessories

KT003230N003	15cm (6") Wet Film Wheel Handle
KT003230N002	50cm (19") Wet Film Wheel Handle

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0003230M001 is the certificate for model K0003230M001).

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Elcometer 3230

Coil Coating Wet Film Wheels

This instrument is similar to the Elcometer 3230 Wet Film Wheel, but is designed for use in the coil coating process. The outer wheels are knurled to allow measurements to be taken on slippery coatings or on fast moving substrates.

By rolling the gauge through a wet coating, the centre wheel eventually touches the film. This point on the scale indicates the thickness.

A convenient mounting handle for the wheel is available in two lengths; 15cm (6") & 50cm (19"); please order separately.

When the volume to solids ratio of the coating is known (generally found on the product data sheet supplied by the manufacturer), the wet film thickness can be used to predict the dry film thickness.

STANDARDS:
ASTM D 1212-A, AS/NZS 1580.107.3, BS 3900-C5-7A, ISO 2808-1B, ISO 2808-7A, JIS K 5600-1-7, NF T30-125

Technical Specification

Part Number	Metric		Part Number	Imperial	
	Scale Range	Graduations		Scale Range	Graduations
K0003230M017	0 - 50µm	2.5µm	K0US3230M017	0 - 2mils	0.1mils
K0003230M018	0 - 100µm	5.0µm	K0US3230M018	0 - 4mils	0.2mils
K0003230M019	0 - 300µm	15.0µm	K0US3230M019	0 - 12mils	0.5mils
Dimensions	50 x 30mm (1.97 x 1.18")		Weight	220g (7.76oz)	
Packing List	Coil Coating Wet Film Wheel, storage case and operating instructions				

Accessories

KT003230N003	15cm (6") Wet Film Wheel Handle	KT003230N002	50cm (19") Wet Film Wheel Handle

Elcometer 3233

Pfund Thickness Gauge

This instrument consists of two concentric cylinders, one sliding inside the other. A spherical glass lens, which has engraved measurements, is fitted to the end of the central cylinder and when pressed into the wet film, leaves a circular trace.

The diameter of the mark on the lens is measured and, using the supplied conversion table, the thickness of the coating can be easily assessed.

- Ideal for measuring the thickness of wet translucent products such as varnish, oils etc
- Measurement range of 2.25 - 360µm (0.09 - 14.17mils)

STANDARDS:
ASTM D 1212-B, NF T30-125

Technical Specification

Part Number	Description		
K0003233M001	Elcometer 3233 Aluminium Pfund Thickness Gauge		
K0003233M002	Elcometer 3233 Stainless Steel Pfund Thickness Gauge		
Dimensions	60 x 80mm (2.36 x 3.15")	Weight	113g (4oz)
Packing List	Pfund Thickness Gauge, stainless steel rule, conversion table, storage case and operating instructions		

Powder Thickness

When applying a powder coating, by measuring the uncured film thickness, it is possible to predict the eventual dry film thickness.

Powder coating is an efficient system producing a high quality finish with minimal waste – where excess or over-sprayed powder may be recycled and reused.

Ensuring that the end product has the correct levels of adhesion, gloss and colour - is dependent upon both the thickness of the powder prior to the curing process and the temperature profile within the oven.

The cured dry film thickness is determined by the level of shrinkage, which in turn is influenced by factors such as particle size and density of the uncured powder.

As all manufacturers' coatings are different, it is not generally possible to predict the dry film thickness post cure unless the level of shrinkage is known or the pre cure powder density is measured.

Measuring the thickness of the uncured powder is difficult. Whereas wet film measurement is non-destructive, the measurement of powder thickness using any form of contact with the uncured coating, disturbs the powder - altering its thickness.

The revolutionary Elcometer 550 accurately predicts the final powder thickness prior to curing. Through the use of non-contact ultrasound technology the density of the powder can be measured providing a predictive value of the final cured coating thickness.

Used on the powder coating the Elcometer 550 gauge therefore offers the opportunity for 'right first time' production and minimal wastage.

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Elcometer 550

Non-Contact Powder Thickness Gauge

Using third generation proven airborne ultrasonic technology, the new Elcometer 550 accurately predicts cured coating thickness by non-contact measurement of coating powders.

Accurately predicts the cured coating thickness within ± 5% of the reading or ±5µm (±0.25mils)

Can be used in accordance with ASTM D7378-C

Proven, 3rd Generation, airborne ultrasonic technology

Hand-held sensor allows easy positioning of the gun for fast measurement

Tough aluminium case, ideal for testing in an industrial environment

Ergonomic gun designed for comfort when taking multiple readings

Large illuminated colour display with positioning indicator to guide orientation of the sensor probe

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Non-Contact Powder Thickness Gauge

Elcometer 550

By carefully controlling the thickness of powder applied to a product, you can minimise your powder usage and ensure the quality of your coating. As contact measurement solutions damage the finish and do not predict the cured coating thickness, measuring the powder thickness pre-cure requires a non-contact solution.

Easy to Use
- Easy to read, large colour display
- Adjustable screen brightness for all test conditions
- Ergonomic probe - ideal for continuous testing
- Can be used straight out of the box with minimal set up time
- On-screen guidance graph and handle LEDs help you orientate the probe sensor for fast, accurate measurements

Reliable
- Fast, accurate and repeatable results
- Can be used in accordance with ASTM D7378-Procedure C
- Proven, 3rd Generation, airborne ultrasonic technology
- User-programmable set up to account for varying powder shrinkage rates

Enhanced Technology
- Measure thicknesses from 30 - 110μm (1.18 - 4.4mils)
- 1mm² (0.04 sq in) measurement area - ideal for flat, curved and small surfaces
- Test coatings on a wide range of substrates, including metal, wood, MDF, plastic and pre-coated surfaces

STANDARDS:
ASTM D7378-Procedure C

Technical Specification   C

Part Number	Description	Certificate
A550----4	Elcometer 550 Non-Contact Powder Thickness Gauge	●
Display	3½ inches (90mm) QVGA Colour LCD	
Power Supply	Rechargeable NiMh battery, up to 7 hours continuous use	
Measurement Range	30 - 110μm (1.18 - 4.4mils)	
Resolution	1μm (0.04mils)	
Measurement Accuracy	±5μm (±0.25mils) or ±5% of the coating thickness, whichever is greater	
Measurement Offset Distance	18mm (0.71") from the coated substrate	
Measurement Area	1mm² (0.04sq in)	
Operating Temperature Range	10°C to 35°C (50°F to 95°F)	
Units	μm / mils switchable	
Dimensions	115 x 185 x 35mm (4.6 x 7.4 x 1.4")	
Weight	900g (1.9lbs)	
Packing List	Elcometer 550 Gauge with rechargeable battery, universal charger unit and cable, sensor gun and lead, shoulder harness, reference block, USB-PC transfer cable, carry case, test certificate and operating instructions	

● Certificate supplied as standard.

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Elcometer 155 — Uncured Powder Film Comb
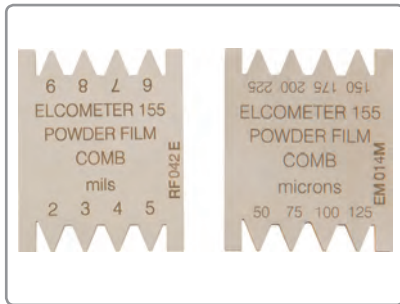
Available in four scale ranges, the Elcometer 155 is designed to measure uncured powder coating film thickness. This enables the application system to be set up and fine tuned prior to the curing process. In turn, this will reduce the amount of scrap and over-spray.

Note: The thickness of a coating prior to cure is not the same value after curing but there is a correlation. The powder comb is suitable as a guide only.

STANDARDS:
ASTM D7378-A

Technical Specification — C

Part Number*	Description	Range	Certificate
B15513573-5	Elcometer 155 Metric Powder Film Comb	50 - 255μm	○
B15513573-6	Elcometer 155 Metric Powder Film Comb	225 - 1250μm	○
B15513573-1	Elcometer 155 Imperial Powder Film Comb	2 - 9 mils	○
B15513573-2	Elcometer 155 Imperial Powder Film Comb	9 - 50mils	○
B15513573-10	Metric Comb Set (2 combs)	50 - 225μm and 225 - 1250μm	○
B15513573-9	Imperial Comb Set (2 combs)	2 - 9mils and 9 - 50mils	○
Accuracy	±5μm (±0.2mil)		
Dimensions	38mm x 46mm (1.5" x 1.8")		
Weight	18g (0.6oz)		
Packing List	Elcometer 155 Powder Comb and powder comb wallet for two combs		

How to use a powder comb
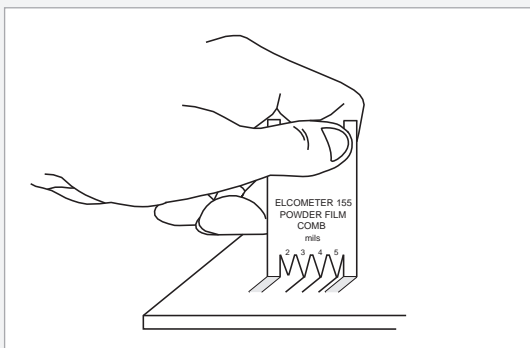
Place the comb into the powder and slide the comb along the surface. The measurement points (or teeth) are pointed and allow the powder to flow around them.

The thickness of the powder lies between the highest value where a drag mark is visible and the lowest value where a drag mark has not been produced.

* The Elcometer 155 is not available for sale in the USA

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCB15513573-5 is the certificate for model B15513573-5).

Dry Film Thickness

Dry Film Thickness is probably the most critical measurement in the coatings industry. It provides vital information as to the expected life of the substrate, the product's fitness for purpose, its appearance and ensures compliance with a host of International Standards.

In 1947, Elcometer launched one of the world's first non-destructive coating thickness gauges, the Elcometer 101.

For more than 6 decades, the design and production qualities of this rugged and reliable instrument have been the watchwords for all our products and these philosophies are still held today.

Elcometer has a comprehensive range of Dry Film Thickness gauges to meet all of your coating inspection requirements, including:

- **Electronic (Type II)**; the most widely used as it is generally the most accurate and can be used to measure the coating on almost any substrate, whether ferrous or non-ferrous

- **Mechanical (Type I);** still widely used, particularly in areas where no electrical instruments are permitted or high temperatures prevail

- **Destructive**; used primarily in multi-coat procedures and non-metallic substrates

Formal quality systems, such as those described in ISO 9000, require gauges to be properly controlled, logged and in calibration. Increasingly, users are specifying that the readings taken by gauges are traceable to National Standards.

There are three types of coating thickness standards available from Elcometer:

- **Calibration Foils**; supplied individually or in sets, these precision foils (or 'shims'), accurately measured to ±1%, offer you the ideal method for adjusting the calibration of your coating thickness gauge on your substrate, taking into account your specific substrate material, surface finish and form, to ensure the greatest possible accuracy. Foils are available with or without a calibration certificate traceable to National Standards (UKAS and NIST).

- **Coated Standards**; mounted in a protective folder, these hard wearing coated ferrous or non-ferrous tiles are ideal for accurately measuring the performance of the coating thickness gauge. Coated standards are accurate to within ±2% and supplied with a calibration certificate.

- **Zero Test Plates**; in some cases, it may be difficult or impractical to obtain an uncoated substrate. For this reason Elcometer provide a range of zero test plates. These test plates, when used in conjunction with a set of foils, are ideal for accurately measuring the performance of your coating thickness gauge.

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Elcometer 456   Coating Thickness Gauge

Specialised probes to meet a
wide range of applications,
- see pages 189 - 191

Integral and separate gauges to measure
coatings up to 31mm (1220mils)

Dust and water resistant rugged
design equivalent to IP64

Secure probe connection for
improved durability

Large easy to read measurements in
Metric and Imperial units

View up to 8 user selectable statistics
on screen
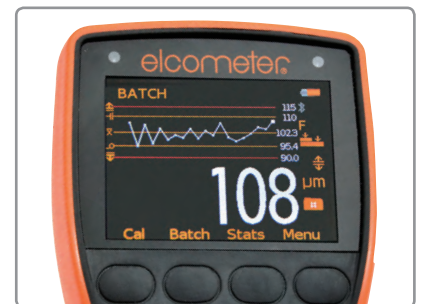
On-screen trend graph displaying last
20 measurement values

elcometer®

new

Fast reading rate of more than 70 readings per minute

Large easy to read colour display

Scratch and solvent resistant screen

Auto rotating display with tap awake feature

Stores up to 150,000 readings in alpha numeric batches

Large buttons with positive feedback

USB and Bluetooth® data output to ElcoMaster™ 2.0 software

supplied with
ElcoMaster™ 2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
✸ Bluetooth®
wireless technology
see page 186
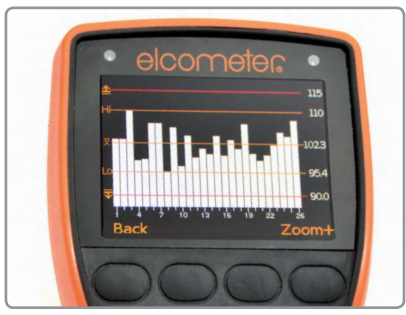
Individual batch readings can be reviewed numerically or graphically

The Elcometer 456 sets new standards; providing reliable and accurate coating thickness measurements; helping you to become more efficient.

elcometer®

Elcometer 456

Coating Thickness Gauge

Bigfoot™ integral probe for accurate and repeatable measurements

Ergonomic design for comfort during continuous use

2.4" colour screen provides enhanced reading visibility at all angles

new

Easy

- Large buttons ideal for gloved hands
- Easy to use menus in multiple languages
- High contrast colour LCD with auto rotate
- High and low reading limit indicators
- Factory calibrated for immediate use

Accurate

- Measurement capability to ±1%
- Can be used in accordance with National & International Standards
- Temperature stable measurements
- Increased reading resolution for thin coatings
- Measures accurately on smooth, rough, thin and curved surfaces

Reliable

- Repeatable and reproducible
- 2 year gauge warranty
- Supplied with fully traceable test certificates
- Batch date and time stamp facility

Paperless Quality Assurance with the ElcoMaster™ suite of products

supplied with
ElcoMaster™ 2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page 186

www.elcometer.com

Coating Thickness Gauge

Elcometer 456

new

Rugged

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP64
- Scratch and solvent resistant display
- Durable gauge and probe construction
- Suitable for use in harsh environments

Efficient

- Fast reading rate of 70+ per minute
- Multiple calibration memories
- Alpha numeric batch identification
- User selectable calibration methods
- Compatible with all Elcometer software including ElcoMaster™ 2.0

Powerful

- Wide range of interchangeable probes
- USB and Bluetooth® data output
- Stores up to 150,000 readings in 2,500 batches
- Measures up to 31mm (1200mils) of coating on metal substrates

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6B, BS 3900-C5-6A, BS 5411-11, BS 5411-3, BS 5599, DIN 50981, DIN 50984, ECCA T1, EN 13523-1, IMO MSC.215(82), IMO MSC.244 (83), ISO 1461, ISO 19840, ISO 2063, ISO 2360, ISO 2808-6A, ISO 2808-6B, ISO 2808-7C, ISO 2808-7D, ISO 2808-12, JIS K 5600-1-7, NF T30-124, SS 184159, SSPC PA 2, US Navy PPI 63101-000, US Navy NSI 009-32

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Elcometer 456 Coating Thickness Gauge

Product Features			■ Standard	□ Optional
	Model E	Model B	Model S	Model T
Fast, accurate reading rate; *70+ readings per minute*	■	■	■	■
Repeatable & reproducible measurements	■	■	■	■
Easy to use menu structure; *in 30+ languages*	■	■	■	■
Tough, impact, water & dust resistant; *equivalent to IP64*	■	■	■	■
Bright colour screen; *with permanent back light*	■	■	■	■
Scratch & solvent resistant display; *2.4" (6cm) TFT*	■	■	■	■
Large positive feedback buttons	■	■	■	■
USB power supply; *via PC*	■	■	■	■
Test certificate	■	■	■	■
2 year gauge warranty	■	■	■	■
Automatic rotating display; *0°, 90°, 180° & 270°*		■	■	■
Ambient light sensor; *with adjustable auto brightness*		■	■	■
Emergency light		■	■	■
Tap awake from sleep		■	■	■
Gauge software updates[1]; *via ElcoMaster™ 2.0 software*		■	■	■
Data output		■	■	■
USB; *to computer*		■	■	■
Bluetooth ®; t*o computer, pda or mobile phone*			■	■
On screen statistics		■	■	■
Number of readings; *η*		■	■	■
Mean (average); $\bar{x}$		■	■	■
Standard deviation; σ		■	■	■
Highest reading; *hi*		■	■	■
Lowest reading; *lo*		■	■	■
Coefficient of variation; *COV*		■	■	■
Elcometer index value[2]; *EIV*		■	■	■
Nominal dry film thickness; *NDFT*			■	■
IMO PSPC; *%>NDFT, %>90<NDFT, 90:10 pass/fail*			■	■
High & low limits; *definable audible & visual alarms*			■	■
Number above high limit;			■	■
Number below low limit;			■	■
Live reading trend graph; *in batch mode*			■	■
ElcoMaster™ 2.0 software & USB cable		□	■	■
Alarm; *daily (d), interval (i)*			d	d,i
Replaceable screen protectors	□	□	■	■
Protective case	□	■	■	■
Plastic transit case	□	□	□	■
Integral models; *with automatic gauge switch on*	■	■	■	■
Probe type; *Ferrous (F), Non-Ferrous (N), Dual (FNF)[3]*	F, FNF	F, N, FNF	F, N, FNF	F, N, FNF
Measurement range	0-1500μm 0-60mils	0-13mm 0-500mils	0-1500μm 0-60mils	0-1500μm 0-60mils
Separate models; *with automatic probe recognition*		■	■	■
Probe type; *Ferrous (F), Non-Ferrous (N), Dual (FNF)[3]*		F, N, FNF	F, N, FNF	F, N, FNF
Measurement range; *see pages 189 - 191 for probe selection*		0-31mm 0-1220mils	0-31mm 0-1220mils	0-31mm 0-1220mils

■ Standard   □ Optional

[1] Internet connection required   [2] Elcometer Index Values are used in the automotive industry to assess a coating's overall quality; USA Patent Number US7606671B2
[3] FNF Patent Numbers UK: GB2306009B; USA: 5886522

Coating Thickness Gauge

Elcometer 456

Product Features	■ Standard	□ Optional		
	Model E	Model B	Model S	Model T
On-screen calibration instructions; *in 30+ languages*	■	■	■	■
Multiple calibration methods	■	■	■	■
Factory; *resets to the factory calibration*	■	■	■	■
2-point; *for smooth and rough surfaces*	■	■	■	■
1-point; *zero calibration*		■	■	■
Zero offset[4]*; for calibration according to ISO19840*			■	■
Predefined calibration & measurement methods			■	■
ISO, SSPC PA2, Swedish, Australian			■	■
Automatic calibration; *for rapid calibration*			■	■
Calibration memory type; *gauge (g) or gauge & batch (gb)*	g	g	gb	gb
Number of batches; *with unique calibrations*			1	2,500
Calibration memories; *3 user-programmable memories*				■
Measurement outside calibration warning				■
Calibration lock; *with optional PIN code unlock*		■	■	■
Delete last reading		■	■	■
Gauge memory; *number of readings*		Last 5	1,500	150,000
Individual batch calibrations; *sent to PC via ElcoMaster™ 2.0*			■	■
Limits; *user definable audible & visual pass/fail warnings*			■	■
Gauge (g) or gauge & batch specific (gb) limits			g	gb
Date and time stamp			■	■
Batch types; *normal, counted average, IMO PSPC*			■	■
Batch review graph				■
Review, clear & delete batches			■	■
Copy batches and calibration settings				■
Alpha-numeric batch names; *user definable on the gauge*				■
Fixed batch size mode; *with batch linking*				■

Technical Specification

Display information	2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels
Battery type	2 x AA dry cell batteries, rechargeable batteries can also be used
Battery life	approx 24 hours of continuous use at 1 reading per second[5]
Gauge dimensions (h x w x d)	141 x 73 x 37mm (5.55 x 2.87 x 1.46")
Gauge weight (including batteries supplied)	Separate: 161g (5.68oz) Integral: 156g (5.50oz)
Operating temperature	-10 to 50°C (14 to 122°F)
Packing List	Elcometer 456 gauge, calibration foils (integrals only), wrist harness, transit case (T), protective case (B, S, T), 1 x screen protectors (S, T), 2 x AA batteries, operating instructions, USB cable (S, T), ElcoMaster™ 2.0 software (S, T) For separate gauge probe options see pages 189 - 191

■ Standard   □ Optional

[4] Zero Offset USA Patent Number US6243661   [5] Using default settings & lithium batteries supplied, alkaline or rechargeable batteries may differ

Dry Film Thickness - Digital

Elcometer 456

Integral & Separate model range

The Elcometer 456 is available in four different models. Each gauge provides the user with increasing functionality - from the entry level Elcometer 456 Model E, to the top of the range Elcometer 456 Model T.

Integral gauges are ideal for single handed operation as the wide footprint of the Bigfoot™ internal probe provides greater stability during measurement - allowing for consistent, repeatable and accurate results.

Separate models, with their wide range of probes, provide even greater measurement flexibility. See pages 189 -191 for more details.

Integral Model Options C

Scale 1	Range: 0-1500µm (0-60mils)		Accuracy*: ±1-3% or ±2.5µm (±0.1mil)		
	Resolution: 0.1µm: 0-100µm; 1µm: 100-1500µm (0.01mil: 0-5mils; 0.1mil: 5-60mils)				
	Model E	Model B	Model S	Model T	Certificate
Elcometer 456 Ferrous Integral	A456CFEI1	A456CFBI1	A456CFSI1	A456CFTI1	●
Elcometer 456 Non-Ferrous Integral	-	A456CNBI1	See separate gauges with N2 PINIP™ Probe	See separate gauges with N2 PINIP™ Probe	●
Elcometer 456 Dual FNF Integral	A456CFNFEI1	A456CFNFBI1	A456CFNFSI1	A456CFNFTI1	●

Scale 2	Range: 0-5mm (0-200mils)		Accuracy*: ±1-3% or ±20µm (±1.0mil)		
	Resolution: 1µm: 0-1mm; 10µm: 1-5mm (0.1mil: 0-50mils; 1mil: 50-200mils)				

For higher resolution & accuracy on thin coatings Scale 2 gauges can be switched to the Scale 1 mode measurement performance

	Model E	Model B	Model S	Model T	Certificate
Elcometer 456 Ferrous Integral	-	A456CFBI2	See separate gauges with F2 PINIP™ Probe	See separate gauges with F2 PINIP™ Probe	●

Scale 3	Range: 0-13mm (0-500mils)		Accuracy*: ±1-3% or ±50µm (±2.0mils)		
	Resolution: 1µm: 0-2mm; 10µm: 2-13mm (0.1mil: 0-100mils; 1mil: 100-500mils)				
	Model E	Model B	Model S	Model T	Certificate
Elcometer 456 Ferrous Integral	-	A456CFBI3	See separate gauges with F3 PINIP™ Probe	See separate gauges with F3 PINIP™ Probe	●

Separate Model Options

	Model E	Model B	Model S	Model T	Certificate
Elcometer 456 Ferrous Separate	-	A456CFBS	A456CFSS	A456CFTS	●
Elcometer 456 Non-Ferrous Separate	-	A456CNBS	A456CNSS	A456CNTS	●
Elcometer 456 Dual FNF Separate	-	A456CFNFBS	A456CFNFSS	A456CFNFTS	●

Probes are supplied separately, see pages 189 - 191 for details

Accessories

T99922341	Self Adhesive Screen Protectors (x10)
T99921325	USB Cable
T45622371	Benchtop Inspection Stand - for Separate Gauges

● Certificate supplied as standard.

* Whichever is the greater

elcometer®

Probe range   **Elcometer 456**

All Elcometer 456 probes are fully interchangeable; ferrous gauges accept any ferrous probe, non-ferrous gauges accept any non-ferrous probes and the dual FNF gauges accept all ferrous, non-ferrous and dual FNF probes.

Available in a number of designs and scale ranges to meet your specific application, all probes are supplied with an Elcometer Test Certificate and a set of calibration foils[†]

Straight
Measures coatings on both flat and curved surfaces

Right Angle
For taking readings where access is restricted

Mini
Ideal for edges, narrow pipes and small surface areas

PINIP™
Plug-in probes convert a separate to an integral gauge

Telescopic
Extending right angle probes for out of reach areas

Specialist
Designed for measurement on specialist substrates such as graphite or for electro-plating

Waterproof
Sealed for use under water at depth, even in diving gloves

High Temperature
For use on hot coated materials up to 250°C (480°F)

Anodiser
Chemical resistant washable probes ideal for the anodising environment

Armoured
Probes with metal reinforced heavy duty cables

Soft Coating
Large surface area probes for soft reach materials (HVCA approved)

Ferrous probes measure non magnetic coatings on ferro-magnetic substrates. Non-ferrous probes measure non conductive coatings on non-ferrous metal substrates. Dual FNF probes measure both ferrous and non-ferrous applications with automatic substrate detection.

Unless stated, Elcometer separate probes have a maximum operating temperature of 150°C (300°F), PINIP™ probes have a maximum operating temperature of 80°C (176°F).

† Foil sets are appropriate to the separate probe's scale range - see page 202 for the foil values supplied in each set

elcometer®

Elcometer 456   Probe range

Scale 1

	Range: 0-1500µm (0-60mils)			Accuracy*: ±1-3% or ±2.5µm (±0.1mil)			
	Resolution: 0.1µm: 0-100µm; 1µm: 100-1500µm (0.01mil: 0-5mils; 0.1mil: 5-60mils)					Certificate: ●	

Probe Design	Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
Straight	T456CF1S	T456CN1S	T456CFNF1S	F, N	85mm (3.35")	F, N, FNF (F)	4mm (0.16")
				FNF	88mm (3.46")	FNF (N)	6mm (0.24")
Right Angle	T456CF1R	T456CN1R	T456CFNF1R	F, N	28mm (1.10")	F, N, FNF (F)	4mm (0.16")
				FNF	38mm (1.50")	FNF (N)	6mm (0.24")
Mini 90° (M5) 45mm (1.77")	T456CFM5R90A	T456CNM5R90A	-	F, N	16mm (0.63")	F, N	4mm (0.16")
Mini 90° (M5) 150mm (5.9")	-	T456CNM5R90C	-	N	16mm (0.63")	N	4mm (0.16")
Mini 90° (M5) 400mm (15.7")	-	T456CNM5R90E	-	N	16mm (0.63")	N	4mm (0.16")
Straight Sealed	T456CF1E			F	85mm (3.35")	F	4mm (0.16")
Mini 90° (M5) Sealed 45mm (1.77")	T456CFME5R90A			F	16mm (0.63")	F	4mm (0.16")
Mini 90° (M5) Sealed 45mm (1.77") 2m C	T456CFME5R90A-2			F	16mm (0.63")	F	4mm (0.16")
Anodiser	-	T456CN1AS	-	N	100mm (3.94")	N	4mm (0.16")
PINIP™	T456CF1P	T456CN1P	T456CFNF1P	F	170mm (6.69")	F, N, FNF (F)	4mm (0.16")
				N, FNF	180mm (7.09")	FNF (N)	6mm (0.24")

new

Scale 2

	Range: 0-5mm (0-200mils)			Accuracy*: ±1-3% or ±20µm (±1.0mil)			
	Resolution: 1µm: 0-1mm; 10µm: 1-5mm (0.1mil: 0-50mils; 1mil: 50-200mils)					Certificate: ●	

Probe Design	Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
Straight	T456CF2S	T456CN2S	-	F	89mm (3.50")	F	8mm (0.32")
				N	88mm (3.46")	N	14mm (0.55")
Right Angle	T456CF2R	-	-	F	32mm (1.26")	F	8mm (0.32")
Armoured	T456CF2ARM	-	-	F	138mm (5.43")	F	8mm (0.32")
Telescopic 56 -122cm (22 - 48")	T456CF2T	-	-	F	36mm (1.42")	F	8mm (0.32")
Soft Coating	T456CF2B	-	-	F	89mm (3.50")	F	8mm (0.32")
Waterproof 1m (3') cable	T456CF2SW	-	-	F	138mm (5.43")	F	8mm (0.32")
Waterproof 5m (15') cable	T456CF2SW-5	-	-	F	138mm (5.43")	F	8mm (0.32")
Waterproof 15m (45') cable	T456CF2SW-15	-	-	F	138mm (5.43")	F	8mm (0.32")
Waterproof 30m (98') cable	T456CF2SW-30	-	-	F	138mm (5.43")	F	8mm (0.32")
Waterproof 50m (164') cable	T456CF2SW-50	-	-	F	138mm (5.43")	F	8mm (0.32")
PINIP™	T456CF2P	T456CN2P	-	F	174mm (6.85")	F	8mm (0.32")
				N	185mm (7.28")	N	14mm (0.55")
Hi-Temperature 250°C (480°F)	T456CF2PHT	-	-	F	174mm (6.85")	F	8mm (0.32")

Scale 3

	Range: 0-13mm (0-500mils)			Accuracy*: ±1-3% or ±50µm (±2.0mils)			
	Resolution: 1µm: 0-2mm; 10µm: 2-13mm (0.1mil: 0-100mils; 1mil: 100-500mils)					Certificate: ●	

Probe Design	Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
Straight	T456CF3S	-	-	F	102mm (4.02")	F	14mm (0.55")
PINIP™	T456CF3P	-	-	F	184mm (7.24")	F	14mm (0.55")

● Certificate supplied as standard.

† FNF (F): FNF probe in F mode FNF (N): FNF probe in N mode
* Whichever is the greater

Probe range

Elcometer 456

Scale 6	Range: F: 0-25mm (0-980mils) N: 0-30mm (1200mils)			Accuracy*: ±1-3% or ±100µm (±4.0mil)		
	Resolution: 10µm: 0-2mm; 100µm: 2-30mm (1mil: 0-100mils; 10mils: 100-1200mils)				Certificate: ●	

Probe Design		Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
	Straight	T456CF6S	T456CN6S	-	F	150mm (5.90")	F	51 x 51mm² (2 x 2 sq. inch)
					N	160mm (6.30")	N	58mm (2.29")
	Armoured	T456CF6ARM	T456CN6ARM	-	F	190mm (7.48")	F	51 x 51mm² (2 x 2 sq. inch)
					N	200mm (7.87")	N	58mm (2.29")

new

Scale 7	Range: F: 0-31mm (0-1220mils)			Accuracy*: ±1-3% or ±100µm (±4.0mil)		
	Resolution: 10µm: 0-2mm; 100µm: 2-31mm (1mil: 0-100mils; 10mils: 100-1220mils)				Certificate: ●	

Probe Design		Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
	Armoured	T456CF7ARM	-	-	F	200mm (7.87")	F	55 x 55mm² (2.17 x 2.17 sq. inch)

Scale 0.5	Range: 0-500µm (0-20mils)			Accuracy*: ±1-3% or ±2.5µm (±0.1mil)		
	Resolution: 0.1µm: 0-100µm; 1µm: 100-500µm (0.01mil: 0-5mils; 0.1mil: 5-20mils)				Certificate: ●	

Probe Design (M3)		Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
	Mini 45mm (1.77")	T456CFM3---A	T456CNM3---A	-	F	6mm (0.24")	F	3mm (0.12")
					N	6mm (0.24")	N	4mm (0.16")
	Mini 90° 45mm (1.77")	T456CFM3R90A	T456CNM3R90A	-	F	16mm (0.63")	F	3mm (0.12")
					N	16mm (0.63")	N	4mm (0.16")
	Mini 45° 45mm (1.77")	T456CFM3R45A	-	-	F	18mm (0.71")	F	3mm (0.12")
	Mini 90° 150mm (5.90")	T456CFM3R90C	T456CNM3R90C	-	F	16mm (0.63")	F	3mm (0.12")
					N	16mm (0.63")	N	4mm (0.16")
	Mini 90° 300mm (11.8")	T465CFM3R90D	-	-	F	16mm (0.63")	F	3mm (0.12")
	Mini 45° 300mm (11.8")	T456CFM3R45D	-	-	F	18mm (0.71")	F	3mm (0.12")
	Mini 90° 400mm (15.7")	-	T456CNM3R90E	-	F	16mm (0.63")	N	4mm (0.16")

Scale 0.5 Graphite	Range: 0-500µm (0-20mils)			Accuracy*: ±1-3% or ±2.5µm (±0.1mil)		
	Resolution: 0.1µm: 0-100µm; 1µm: 100-500µm (0.01mil: 0-5mils; 0.1mil: 5-20mils)				Certificate: ●	

Probe Design		Ferrous F	Non-Ferrous N	Dual Probe FNF	Minimum Headroom		Minimum Sample Diameter†	
	Mini 90° Graphite 45mm (1.77")	-	T456CNMG3R90A	-	N	16mm (0.63")	N	4mm (0.16")
	Mini 90° Graphite 150mm (5.90")	-	T456CNMG3R90C	-	N	16mm (0.63")	N	4mm (0.16")
	Mini 90° Graphite 400mm (15.7")	-	T456CNMG3R90E	-	N	16mm (0.63")	N	4mm (0.16")

For a full range of calibration standards and foils sets see pages 201 - 203

● Certificate supplied as standard.

* Whichever is the greater

elcometer®
inspection equipment

ElcoMaster 2.0
DATA MANAGEMENT SOFTWARE

Combines all your inspection records in one report, instantly!

From surface profile to climate monitoring, dry film thickness to data management; Elcometer combines high quality products with simple data management - producing professional inspection reports at the click of a button.

Surface Profile	**Climate Monitoring**	**Coating Thickness**	**ElcoMaster™ 2.0**
The Elcometer 224 digital surface profile gauge, available as either integral or separate probe versions, is faster than ever before.	The Elcometer 319 dewpoint meter records all the critical climate parameters for the coating's professional: surface, air & dewpoint temperatures, %RH & ΔT.	Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.	ElcoMaster™ 2.0 is the simple yet powerful software solution; combining all your inspection results instantly in one professional report.
See page 120	See page 150	See page 182	See page 264

Probe Accessories

Probe Accessories

Jumbo Hand Grip
Ideal for precision placement for the most accurate results on flat and curved surfaces. Place the probe inside the Jumbo Hand Grip and take measurements - ideal when wearing gloves. Suitable for any Elcometer 456 Scale 1 or Scale 2 straight probes.

F and N Probes	Dual FNF Probes	
T9997766-	T99913225	Jumbo Adaptor

V-Probe Adaptor
Ideal for precision placement for the most accurate results on medium and large diameter curved surfaces such as pipes and cylinders. Suitable for any Elcometer 456 Scale 1 or Scale 2 straight probes.

F and N Probes	Dual FNF Probes	
T9997381-	T99913133	V-Probe Adaptor

Probe Replacement Jig
The Elcometer probe placement jig is the ideal accessory for measuring coatings on small or complex components but also when the highest levels of repeatability and accuracy are required.

T95012880	Probe Placement Jig - as displayed

Each probe placement jig is supplied with a probe housing to suit Scale 1 or Scale 2 straight probes and a component holder.

T95013028	Component Hand Vice - as displayed
T95012888	Cable Release Assembly - ideal for remote measurements
T95015961	Dual FNF Probe Housing Adaptor
T95016896	Mini Probe Housing Adaptor

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Elcometer 355

Coating Thickness Gauge

The Elcometer 355's watchwords are accuracy, simplicity, versatility and durability making this a true state of the art hand-held measuring system packed with time-saving and cost-cutting features.

Available as a standard and top model, the unit's large memory stores up to 10,000 readings in batches and data can be output to PC, datalogger or printer as required.

With a comprehensive range of Probe Modules available, just select the most appropriate for the application. All modules are supplied with calibration foils.

- ±1% or 1μm, whichever is the greater, accuracy
- Rugged aluminium case designed for the toughest environments
- ElcoMaster™ 2.0 software supplied, see pages 264 - 265
- Full statistical analysis - mean standard deviation, number of readings, highest and lowest value
- RS232 output
- Date and time stamp
- For a full list of probes and accessories, see pages 195 - 196

supplied with
ElcoMaster™ 2.0
data management software
see page 264

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B 244, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6A, BS 3900-C5-6B, BS 5411-3, BS 5411-11, BS 5599, DIN 50981, DIN 50984, ECCA T1, EN 13523-1, IMO MSC.215(82), IMO MSC.244 (83), ISO 1461, ISO 19840, ISO 2063, ISO 2360, ISO 2808-6A, ISO 2808-6B, ISO 2808-7C, ISO 2808-7D, ISO 2808-12, JIS K 5600-1-7, NF A49-211, NF T30-124, SS 184159, SSPC PA 2, US Navy PPI 63101-000, US Navy NSI 009-32

Product Features   C

Part Number	Description	Certificate
A355----S	Elcometer 355 Standard Coating Thickness Gauge	○
A355----T	Elcometer 355 Top Coating Thickness Gauge	○
Operating Temperature	0°C to 50°C (32°F to 120°F)	
Storage Temperature	-10°C to 60°C (14°F to 140°F)	
Dimensions	175 x 83 x 42mm (6.9 x 3.3 x 1.6")	
Weight	650g (1.43lb)	
Reading Speed	40 readings per minute	
Data Output	RS232C Serial or Parallel Output via D25 Type Connector (Female)	
Memory	Standard: 5,000 reading memory in 25 pre-set batches Top: 10,000 reading memory in up to 200 batches (individually calibrated)	
Battery Type	3 x 1.5V AA Cells (Alkaline) or 3 x 1.5V Nickel Metal Hydride rechargeable cells	
Battery Life	Minimum: 40 hours with alkaline batteries, 20 hours with rechargeable batteries	
Packing List	Elcometer 355 Top or Standard Gauge, leather carry case, 3 x AA batteries, ElcoMaster™ 2.0 software, PC cable and operating instructions	

For a full range of calibration standards and foils sets see pages 201 - 203

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA355----T is the certificate for model A355----T).

Coating Thickness Gauge

Elcometer 355

Unique probe modules allow the Elcometer 355 Coating Thickness Gauges to be versatile and flexible for any measurement application.

Probe modules can be freely interchanged as required for both ferrous (F) and non-ferrous (N) metal substrates.

Most probe modules are capable of an accuracy of ±1% of the reading on a variety of coatings and surfaces.

Telescopic probes extend from 410mm (16") to 1100mm (43").

Probe Range				C

Scale 1

Range: 0-1500µm (0-60mils)		Accuracy*: ±1% or ±1µm (±0.04mil)		
Resolution:	0.1µm: 0-200µm; 0.5µm: 200-500µm; 1µm: 500-1500µm (0.005mil: 0-8mils; 0.02mil: 8-20mils; 0.05mil: 20-60mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F1 Standard	T35511952	85mm (3.35")	6mm (0.24")	○
F1 Right Angle	T35511953	28mm (1.10")	6mm (0.24")	○
F1 Telescopic	T35511959	30mm (1.18")	6mm (0.24")	○
N1 Standard	T35511982	85mm (3.35")	8mm (0.31")	○
N1 Right Angle	T35511983	28mm (1.10")	8mm (0.31")	○

Scale 2

Range: 0-5mm (0-200mils)		Accuracy*: ±1% or ±5µm (±0.2mil)		
Resolution:	2µm: 0-500µm; 5µm: 500-5000µm (0.1mil: 0-20mils; 0.2mil: 20-200mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F2 Standard	T35511954	89mm (3.50")	10mm (0.39")	○
F2 Right Angle	T35511955	32mm (1.26")	10mm (0.39")	○
F2 Telescopic	T35511960	36mm (1.42")	10mm (0.39")	○
N2 Standard	T35511984	88mm (3.46")	18mm (0.71")	○

Scale 3

Range: 0-13mm (0-500mils)		Accuracy*: ±2% or ±30µm (±1mil)		
Resolution:	5µm: 0-1mm; 10µm: 1-13mm (0.2mil: 0-40mils; 0.2mil: 40-500mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F3 Standard	T35511956	102mm (4.02")	18mm (0.71")	○

Scale 4

Range: 0-250µm (0-10mils)		Accuracy*: ±1% or ±1µm (±0.04mil)		
Resolution:	0.1µm: 0-250µm (0.005mil: 0-10mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F4 Standard	T35511950	85mm (3.35")	4mm (0.16")	○
F4 Right Angle (long)	T35511951	18mm (0.71")	3mm (0.12")	○
N4 Standard	T35511980	90mm (3.54")	8mm (0.31")	○

Scale 5

Range: 0-800µm (0-32mils)		Accuracy*: ±1% or ±2µm (±0.08mil)		
Resolution:	1µm: 0-800µm (0.1mil: 0-32mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F5 (Rebar)	T35511962	85mm (3.35")	4mm (0.16")	○

Scale 6

Range: 0-25mm (0-1000mils)		Accuracy*: ±2% or ±100µm (±4mils)		
Resolution:	10µm: 0-5mm, 50µm: 5-25mm (0.5mil: 0-200mils, 2mil: 200-1000mils)			

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F6 Standard	T35511964	150mm (5.9")	51mm (2.0")	○

* Whichever is greater

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCT35511980 is the certificate for model T35511980).

elcometer®

Elcometer 355   Coating Thickness Gauge

Accessories

Jumbo Hand Grip

Ideal for precision placement for the most accurate results on flat and curved surfaces. Place the probe inside the Jumbo Hand Grip and take measurements - ideal when wearing gloves.

Part Number	Description
T9997766-	Jumbo Hand Grip - F and N Probes
	For use with the following Elcometer 355 probes: F1 Standard, F2 Standard, F4 Standard, F5 Rebar, N1 Standard

V-Probe Adaptor

Ideal for precision placement for the most accurate results on medium and large diameter curved surfaces such as pipes and cylinders.

Part Number	Description
T9997381-	V-Probe Adaptor - F and N Probes
	For use with the following Elcometer 355 probes: F1 Standard, F2 Standard, F4 Standard, F5 Rebar, N1 Standard

Soft Material/Blanket Probe

Ideal for taking precision readings on soft coatings or printing blankets. The wide, flat base design acts as a load spreader, reducing the total force at a single point.

Part Number	Description
T35511963	Soft Material/Blanket F2 Probe for Elcometer 355
Range:	0-5mm (0-200mils)
Accuracy:	±1% or ±5µm (±0.2mil)
Resolution:	2µm: 0-500µm; 5µm: 500-5000µm (0.1mil: 0-20mils; 0.2mil: 20-200mils)

Probe Replacement Jig

For the most reliable and repeatable coating thickness measurements, making the gauge score highly in repeatability and reproducibility studies. Ideal for small and large components alike. The probe placement jig is supplied with a probe housing to suit standard F1, F2, F4, F5 and N1 probes. Housings to suit other probes are available as optional accessories.

Part Number	Description
T95012880	Probe Placement Jig
T95013028	Component Hand Vice - a simple vice to hold small components
T95012888	Cable Release Assembly - ideal for remote measurements
T95015589	N4 Probe Adaptor - must be purchased for use with N4 Probes
	For F1, F2, F4, N1 and N4 Standard & F5 Rebar Elcometer 355 probes.

Paint and Powder Gauge

Elcometer 415

The Elcometer 415 Paint and Powder Coating Thickness Gauge provides a simple, accurate and reliable way to measure coatings on all smooth ferrous and non-ferrous metal surfaces. The gauge auto-switches to read on either ferrous or non-ferrous substrates. This is ideal for measuring paint or powder on both steel and aluminium surfaces such as car body panels or in a powder shop.

The gauge features a large, easy-to-read screen and is capable of taking more than 60 readings per minute. The central Bigfoot™ internal probe, with the integrated V-groove, allows repeatable readings on both flat and curved surfaces. On screen instructions, in over 20 languages, make the gauge useable straight from the box.

Features:

• Angled, large display for viewing from all angles

• Metric or Imperial measurements - displays readings in mils or microns

• Fast and accurate with more than 60 readings per minute

• Factory calibrated for use straight from the box, with 4 calibration foils supplied

• Simple "Zero Cal" feature with fixed calibration setting if access to the uncoated substrate is not available

• Ergonomic design for maximum comfort

• Bigfoot™ probe for repeatable results

• On screen instructions in over 20 languages

STANDARDS:

AS2331.1.4, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 7091, ASTM E 376, BS 3900-C5-6A, BS 3900-C5-6B, BS 5411-11, BS 5411-3, BS 5599, DIN 50981, DIN 50984, ECCA T1, EN 13523-1, ISO 2360, ISO 2808-12, ISO 2808-6A, ISO 2808-6B, ISO 2808-7C, ISO 2808-7D, JIS K 5600-1-7, NF T30-124

Technical Specification   C

Part Number	Description	Certificate
A415FNFI1	Elcometer 415 Paint and Powder Coating Thickness Gauge	○
A415FNFI1AUTO	Elcometer 415 Automotive Gauge (complete with F & N calibration plates)	○
Range	0 to 1000µm (0 to 40mils)	
Resolution	1µm (0.1mil)	
Accuracy	±3% or ±3µm (±0.12mil)	
Measurement Speed	Greater than 60 readings per minute	
Operating Temperature (ambient)	0°C to 50°C (32°F to 120°F)	
Maximum Operating Temperature (probe)	80°C (176°F)	
Storage Temperature	-10°C to 55°C (14°F to 130ºF)	
Case	High impact ABS plastic	
Batteries	2 x LR03 (AAA) alkaline dry batteries or rechargeable equivalents	
Weight	130g (4.1oz)	
Dimensions	110 x 75 x 35mm (4.3 x 3 x 1.38")	
Packing List	Elcometer 415 gauge, calibration foils, soft carry case, 2 x LR03 batteries & operating instructions. The Elcometer 415 AUTO has 2 calibration zero plates.	

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA415FNFI1 is the certificate for model A415FNFI1).

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Elcometer 311

Automotive Refinishing Gauge

The Elcometer 311 has been specifically designed to meet the requirements of today's automotive refinishing market and is available in two models.

The Ferrous instrument is ideal for measuring coatings on steel body panels. The FNF instrument enables the user to measure on both steel and aluminium panels using one gauge with automatic switching.

Pre-calibrated on steel and aluminium car body panels, the Elcometer 311 is very easy to use. Checkpieces are supplied with each instrument to verify accuracy.

- Designed specifically to meet the requirements of the automotive industry
- Ferrous (F) and Ferrous/Non Ferrous (FNF) gauges available
- Pre-calibrated on automotive steel and aluminium
- Big Foot™ integral probe for stable, repeatable readings
- Scale range of 0-500µm (0-20mils)
- Auto On/Off
- Ferrous (F) checkpiece included to verify performance - the FNF gauge is also supplied with a non-ferrous (N) checkpiece
- Available in Metric or Imperial versions

Technical Specification C

Part Number Metric	Imperial	Description	Certificate
A311FM	A311FE	Elcometer 311 Automotive Refinishing Gauge (Ferrous)	o
A311FNFM	A311FNFE	Elcometer 311 Automotive Refinishing Gauge (FNF)	o
Scale Range		0 - 500µm (0 - 20mils)	
Resolution		10µm (0.5mil)	
Accuracy		±5% or ±20µm (±5% or ±1.0mil)	
Probe Type		Integral with auto On/Off	
Operating Temperature		0° to 50°C (32°F to 120°F)	
Speed of Readings		30 per minute	
Weight		115g (4.05oz)	
Battery Type		2 x LR03 (AAA) Alkaline Batteries. Battery life: 20 hours	
Dimensions		120 x 56 x 24mm (4.75 x 2.2 x 0.95")	
Packing List		Elcometer 311F or Elcometer 311FNF Automotive Refinishing Gauge, 2 x LR03 (AAA) alkaline batteries, steel checkpiece, aluminium checkpiece (FNF model) with foil, carry case and operating instructions	

Accessories

T99916925	Steel (F) Checkpiece	T99916901	Aluminium (N) Checkpiece
T99016898	Calibration Foil (Metric) 125µm	T99016897	Calibration Foil (Imperial) 5mils

o Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA311FM is the certificate for model A311FM).

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Coating Thickness Gauge

This simple, pull-off gauge is a top-pocket, lightweight, foreman's type gauge for spot check indications of coating thicknesses.

- Insensitive to hot and cold coatings or surfaces - ideal for hot sprayed metal coatings for immediate results

- Easy to use and lightweight

- 3 scales on the instrument body: mils, microns and linear

- Pre-calibrated with no adjustment required

Technical Specification

Part Number	Description
A157----A	Elcometer 157 Coating Thickness Gauge
Ranges	Three scales printed on the body: 0 - 600µm, 0 - 25mils, linear (0 - 10 equally spaced divisions)
Accuracy	±15% of the reading
Packing List	Elcometer 157, protective case, graph card and operating instructions

Coating Thickness Gauge

Elcometer 101

The original non-destructive dry film thickness gauge, the Elcometer 101 was the world's first portable coating thickness gauge with the original being produced in 1947.

- Insensitive to hot and cold surfaces - ideal for hot sprayed metal coatings

- Incorporates reading hold feature

- Accuracy of ±10%

- Ideal for hazardous areas

STANDARDS:
AS 2331.1.3, ASTM B 499, ASTM G 12, BS 5411-11, ISO 2178, JIS K 5600-1-7, SSPC PA2

Technical Specification   C

Part Number	Description	Scale Range	Certificate
A101A-01A	Elcometer 101 Mechanical Coating Thickness Gauge	0 - 600µm (0 - 25mils)	o
Operating Plane	90° to substrate		
Minimum Measurement Area	38 x 15mm (1.5 x 0.6")		
Minimum Measurement Diameter	25mm (1") (on bar material)		
Accuracy	±10% of the reading or 2.5µm (0.1mil) whichever is the greater		
Packing List	Elcometer 101, calibration foils, carry case, wrist harness and operating instructions		

o Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA101A-01A is the certificate for model A101A-01A).

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Elcometer 211

Mechanical Coating Thickness Gauge

The Elcometer 211, commonly referred to as the "Banana Gauge", is a Type I dry film thickness gauge which is not only ideal for use in environments where the use of electronic instruments is difficult, e.g. inflammable atmospheres in oil and gas production, but can also be used for underwater coating inspection.

 This is one of the most popular mechanical gauges in the world.

- Factory calibrated - with user calibration adjustment
- Foils supplied to check calibration on site
- Ideal for cold surfaces and underwater use
- Small and portable with an accuracy ±5%
- The "V" grooved base, ideal for pipeline inspection
- Available in either Metric or Imperial versions, the Elcometer 211 measures coatings up to 6mm (250mils).

STANDARDS:
AS 2331.1.3, AS 3894.3-A, ASTM G 12, ASTM B 499, AS/NZS 1580.108.1, BS 5411-11, BS 3900-C5-6A, DIN 50981, ISO 2178, ISO 2808-6A, ISO 2808-7A, JIS K 5600-1-7, NF T 30-124, SSPC-PA2

Technical Specification   C

Part Number	Description	Range	Certificate
A211F--1M	Elcometer 211 Coating Thickness Gauge	0 - 1000µm	○
A211F--8M	Elcometer 211 Coating Thickness Gauge	0.65 - 6mm	○
A211F--1E	Elcometer 211 Coating Thickness Gauge	0 - 40mils	○
A211F--8E	Elcometer 211 Coating Thickness Gauge	25 - 250mils	○
Accuracy	±5% of the reading or ±2.5µm/0.1mil (whichever is the greater)		
Substrate Thickness	0.4mm (16mils) minimum		
Measurement Area	30mm (1.18") Diameter minimum		
Measurement Diameter	20mm (0.8") minimum		
Edge Effects	Must be at least 6mm (0.24") from edge		
Dimensions	200 x 60 x 30mm (7.8 x 2.4 x 1.2")		
Packing List	Elcometer 211, calibration foil set, carry pouch, neck harness and operating instructions		

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA211F--1M is the certificate for model A211F--1M).

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Individual Precision Foils

Elcometer 990

Calibration foils or 'shims' are the most convenient way of creating a coating thickness standard on the substrate material, surface finish or form. This is the ideal method for adjusting the calibration of the coating thickness gauge to ensure the greatest possible accuracy.

Technical Specification

Part Number	Colour	Dimensions		Values*		Certificate+
T99022570-1A	Silver	50 x 25mm	(1.97 x 0.98")	12.5µm	(0.5mil)	○
T99022570-2A	Purple	50 x 25mm	(1.97 x 0.98")	25µm	(1.0mil)	○
T99022570-2B	Purple	75 x 50mm	(2.95 x 1.97")	25µm	(1.0mil)	○
T99022570-4A	Dark Blue	50 x 25mm	(1.97 x 0.98")	50µm	(2.0mils)	○
T99022570-4B	Dark Blue	75 x 50mm	(2.95 x 1.97")	50µm	(2.0mils)	○
T99022570-6A	Green	50 x 25mm	(1.97 x 0.98")	75µm	(3.0mils)	○
T99022570-7A	Brown	50 x 25mm	(1.97 x 0.98")	125µm	(5.0mils)	○
T99022570-7B	Brown	75 x 50mm	(2.95 x 1.97")	125µm	(5.0mils)	○
T99022570-9A	Peacock Blue	50 x 25mm	(1.97 x 0.98")	175µm	(7.0mils)	○
T99022570-10A	White	50 x 25mm	(1.97 x 0.98")	250µm	(10mils)	○
T99022570-10B	White	75 x 50mm	(2.95 x 1.97")	250µm	(10mils)	○
T99022570-12A	Black	50 x 25mm	(1.97 x 0.98")	500µm	(20mils)	○
T99022570-12B	Black	75 x 50mm	(2.95 x 1.97")	500µm	(20mils)	○
T99022570-14A	Grey-Blue	50 x 25mm	(1.97 x 0.98")	1000µm	(40mils)	○
T99022570-14B	Clear	75 x 50mm	(2.95 x 1.97")	1000µm	(40mils)	○
T99022570-16A	Clear	50 x 25mm	(1.97 x 0.98")	1mm	(40mils)	○
T99022570-17A	Off White	50 x 25mm	(1.97 x 0.98")	1500µm	(60mils)	○
T99022570-18A	Clear	50 x 25mm	(1.97 x 0.98")	2mm	(80mils)	○
T99022570-18B	Clear	75 x 50mm	(2.95 x 1.97")	2mm	(80mils)	○
T99022570-20A	Clear	50 x 25mm	(1.97 x 0.98")	3mm	(120mils)	○
T99022570-21A	Clear	50 x 25mm	(1.97 x 0.98")	4mm	(160mils)	○
T99022570-22B	Clear	75 x 50mm	(2.95 x 1.97")	5mm	(200mils)	○
T99022570-23A	Clear	50 x 25mm	(1.97 x 0.98")	8mm	(310mils)	○
T99022570-24B	Clear	75 x 50mm	(2.95 x 1.97")	9.5mm	(370mils)	○
T99022570-25B	Grey	75 x 50mm	(2.95 x 1.97")	15mm	(590mils)	○
T99022570-26B	Grey	75 x 50mm	(2.95 x 1.97")	25mm	(980mils)	○
T45618978-2**	Grey	n/a		1500µm	(60mils)	○
T45618978-3**	Grey	n/a		5000µm	(197mils)	○

*Actual foil values may vary, but are accurately labelled

**For use with the high temperature PINIP™ probes only due to the potential high temperature of the sample.

Foils supplied in a cap which fits over the PINIP™ probe.

+A Certificate can be supplied with any combination of up to 8 Foils

○ Calibration Certificate available.

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Elcometer 990

Calibration Foils Sets

The Elcometer 990 Calibration Foils are ideal for use in the laboratory, on the production line or on site. Calibration foils or 'shims' are the most convenient way of creating a coating thickness standard on the substrate material, surface finish or form. This is the ideal method for adjusting the calibration of the coating thickness gauge to ensure the greatest possible accuracy.

Features:

* Metric and Imperial values displayed on each foil

* Available individually or in foil sets - with or without Zero Plate

* Precision foils with ±1% accuracy

* Each foil has a unique serial number for traceability

* Available in thicknesses from 12.5µm to 20mm (0.5 to 790mils)

Technical Specification   C

Description	Foil Values (µm)	Foil Values (mils)	Un-Certified	Certified
Scale 1 Foil Set; 0-1500µm (0-60mils)	25, 50, 125, 250, 500, 1000	1.0, 2.0, 5.0, 10, 20, 40	T99022255-1	T99022255-1C
Scale 2 Foil Set; 0-5mm (0-200mils)	25, 50, 125, 250, 500, 1000, 2000, 3000	1.0, 2.0, 5.0, 10, 20, 40, 80, 120	T99022255-2	T99022255-2C
Scale 3 Foil Set; 0-13mm (0-500mils)	250, 500, 1000, 2000, 4000, 8000	10, 20, 40, 80, 160, 315	T99022255-3	T99022255-3C
Scale 4 Foil Set; 0-250µm (0-10mils)	12.5, 25, 50, 125, 250	0.5, 1.0, 2.0, 5.0, 10	T99022255-4	T99022255-4C
Scale 5 Foil Set; 0-500µm (0-20mils)	12.5, 25, 50, 125, 250, 500	0.5, 1.0, 2.0, 5.0, 10, 20	T99022255-5	T99022255-5C
Scale 6 Foil Set; 0-30mm (0-1200mils)	1000, 2000, 5000, 9500, 15mm, 25mm	40, 80, 200, 375, 590, 980	T99022255-6	T99022255-6C
Scale M3 Foil Set; 0-500µm (0-20mils)	12.5, 25, 50, 125, 250, 500	0.5, 1.0, 2.0, 5.0, 10, 20	T99022255-7	T99022255-7C
Scale 2B Foil Set[1]; 0-5mm (0-200mils)	25, 50, 125, 250, 500, 1000, 2000, 2000	1.0, 2.0, 5.0, 10, 20, 40, 80, 80	T99022255-8	T99022255-8C

Using calibration foils

Each foil has been independently measured at the centre point.

For the greatest accuracy, place the probe in the centre of the foil.

Up to 4 foils can be combined to create a wider range of thickness values.

[1] The Scale 2B foil sets are designed for soft coating probes and have a larger foil surface area

● Certificate supplied as standard.

Coated Thickness Standards

Elcometer 995

The Elcometer 995 Coated Thickness Standards are hard wearing, durable and are mounted in a protective folder. They provide the user with an ideal method to accurately measure the performance of the coating thickness gauge.

Features:
- ±2% accuracy, supplied with Calibration Certificate as standard
- Available with either Ferrous (F) or Non-Ferrous (N) substrates
- Each standard is individually serial numbered for traceability
- Can be re-certified by Elcometer to meet ISO requirements
- Standards available in a range of thicknesses
- Special thicknesses can be supplied to meet specific needs
- Coated with a hard wearing film for extended life span

Technical Specification C

Part Number	Description	Values (μm)	Values (mils)	Certificate
T995111262	4 Piece Thickness Standards - Ferrous	Zero, 40, 75, 125, 175	Zero, 1.6, 3.0, 5.0, 7.0	●
T995111271	4 Piece Thickness Standards - Non Ferrous	Zero, 40, 75, 125, 175	Zero, 1.6, 3.0, 5.0, 7.0	●
T995111263	4 Piece Thickness Standards - Ferrous	Zero, 50, 80, 125, 200	Zero, 2.0, 3.0, 5.0, 8.0	●
T995111261	4 Piece Thickness Standards - Ferrous	Zero, 50, 150, 250, 500	Zero, 2.0, 6.0, 10, 20	●

Zero Test Plates

Elcometer 990

Elcometer provides a range of Zero Test Plates. When used in conjunction with a set of foils, Test Plates are ideal to test a coating thickness gauge's functionality and calibration, ideal for when it may be difficult or impractical to obtain an uncoated substrate.

For a list of standards, foils and foil sets, (see pages 201 - 203).

Technical Specification

Description	Size	Size	Ferrous	Non-Ferous
Zero Test Plate ±1%	50.8 x 25.4mm	2.0 x 1.0"	T9994910-	T9994911-
Zero Test Plate ±2%	76.2 x 50.8mm	3.0 x 2.0"	T9999529-	T9999530-
Zero Test Plate - large ±2%	76.2 x 101.6mm	3.0 x 4.0"	T9994054-	T9994055-

● Calibration Certificate supplied as standard.

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Elcometer 121/4

Standard & Top Paint Inspection Gauges

Available in two models, the Elcometer 121 Paint Inspection Gauge is designed to measure the thickness of single or multiple layers of coatings.

Both models are supplied with illuminated integrated graticule microscopes.

The Top model has an internal carousel allowing each of the three cutters to be selected easily together with a cross hatch adhesion tester.

- Compact and convenient, ideal for use in confined areas
- Made of anodised aluminium for durability
- Bright LED light source for clear vision
- Top Model can hold one cross hatch cutter & three standard cutters which are locked tight, a simple rotation of the cutter holder changes the cutting tool.

STANDARDS:
AS 1580.108.2, AS 1580.408.4*,
AS 3894.9*, ASTM D 3359-B*,
ASTM D 4138-A, BS 3900-C5-5B,
BS 3900-E6*, DIN 50986, ECCA T6*,
EN 13523-6*, ISO 2808-5B,
ISO 16276-2*, ISO 2409*,
ISO 2808-6B, JIS K 5600-1-7,
NF T30-038*, NF T30-123

Technical Specification   C

	Description		
	Elcometer 121/4 Standard P.I.G.	Elcometer 121/4 Top P.I.G.	Certificate
Part Number	A121---S	A121---T	○
Range	2 - 2000µm (0.08 - 80mils) Accuracy is dependent on tool cut angle, half a division		
Dimensions	110 x 75 x 30mm (4.3 x 3 x 1.2"), 369g (13oz)	110 x 75 x 40mm (4.3 x 3 x 1.6), 383g (13.5oz)	
Packing List	Elcometer 121/4, cutters 1, 4 and 6, x50 microscope, 4 x AG3 batteries for lamp (fitted), hexagonal wrench, black marker pen, wrist strap, carry case and operating instructions		

Accessories

Part Number	Description	Angle	Measurement Range	Graticule	Certificate
T99915761-1	Tungsten Carbide Cutter No 1	45°	20 - 2000µm (1 - 80mils)	20µm (1mil)	○
T99915761-4	Tungsten Carbide Cutter No 4	26.6°	10 - 1000µm (0.5 - 35mils)	10µm (0.5mil)	○
T99915761-6	Tungsten Carbide Cutter No 6	5.7°	2 - 200µm (0.1 - 8mils)	2µm (0.1mil)	○
			Coating Thickness	Standard	
T99913700-1	X-Hatch Cutter, 6 teeth x 1mm		0 - 60µm (0 - 2.4mils)	ISO	○
T99913700-2	X-Hatch Cutter, 11 teeth x 1mm		0 - 50µm (0 - 2.0mils)	ASTM	○
T99913700-3	X-Hatch Cutter, 11 teeth x 1.5mm		0 - 60µm (0 - 2.4mils)	-	○
T99913700-4	X-Hatch Cutter, 6 teeth x 2mm		50 - 125µm (2.0 - 5.0mils)	ASTM	○
T99913700-4	X-Hatch Cutter, 6 teeth x 2mm		0 - 60µm (0 - 2.4mils)	ISO	○
T99913700-4	X-Hatch Cutter, 6 teeth x 2mm		61 - 120µm (2.4 - 4.7mils)	ISO	○
T99913700-5	X-Hatch Cutter, 6 teeth x 3mm		121 - 250µm (4.8 - 9.8mils)	ISO	○
K0001539M001	Adhesion Tape (1 roll)			ASTM	
T9998894-	Adhesion Tape (2 rolls)			ASTM	
K0001539M002	Adhesion Tape (1 roll)			ISO	
T9999358-	Adhesion Tape (2 rolls)			ISO	

* Standards apply to Top Model only

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCA212---S is the certificate for model A121---S).

elcometer.

Paint Inspection Gauge

Elcometer 141

The Elcometer 141 Paint Inspection Gauge is a quick, versatile method of examination and destructive measurement of coatings.

Portable and easy to use, its ergonomic design gives a balanced weight distribution for a consistent cut, it is ideal for tough coatings and enamels.

- Large easy grip handle - makes cutting thick or hard coatings easy
- Internal cutter storage compartment
- x50 magnification microscope

STANDARDS:
AS 1580.108.2, ASTM D 4138-A, BS 3900-C5-5B, DIN 50986, ISO 2808-5B, ISO 2808-6B, JIS K 5600-1-7, NF T 30-123

Technical Specification   C

Part Number	Description	Certificate
A141---D	Elcometer 141 Paint Inspection Gauge	○
Scale Range	0 to 1.8mm (0 to 0.07")	
Scale Resolution	0.02mm (0.001")	
Dimensions (fitted to handle)	160 x 100 x 35mm (6.3 x 4 x 1.4")	
Weight (fitted to handle)	510g (1lb 2oz)	
Packing List	Elcometer 141 P.I.G, x50 microscope, 3 cutters, marker pen, hexagonal wrench, carry case and operating instructions	

Accessories   C

Part Number	Description	Cutting Angle	Measurement Range	Graticule Scale Factor	Certificate
T99915761-1	Tungsten Carbide Cutter No 1	45°	20 - 2000µm (1 - 80mils)	20µm (1mil)	○
T99915761-4	Tungsten Carbide Cutter No 4	26.6°	10 - 1000µm (0.5 - 35mils)	10µm (0.5mil)	○
T99915761-6	Tungsten Carbide Cutter No 6	5.7°	2 - 200µm (0.1 - 8mils)	2µm (0.1mil)	○
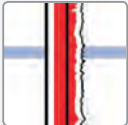
Using the Paint Inspection Gauge
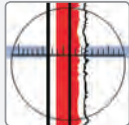
1. Take the coated product.

2. Using the supplied marker, draw a line across the coating.

3. Using the P.I.G, make a cut at right angles to the marker line, all the way down to the substrate.

4. Use the supplied microscope to count the number of graticule divisions across a coating layer & calculate the thickness value using the graticule scale factor.

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCT99915761-1 is the certificate for model T99915761-1).

ELCOMETER 319
DEWPOINT METER

Accurately measures all critical climate parameters in one easy to use hand-held gauge

From surface profile to climate monitoring, dry film thickness to data management; Elcometer combines high quality products with simple data management - producing professional inspection reports at the click of a button.

Surface Profile	**Climate Monitoring**	**Coating Thickness**	**ElcoMaster™ 2.0**
The Elcometer 224 digital surface profile gauge, available as either integral or separate probe versions, is faster than ever before.	The Elcometer 319 dewpoint meter records all the critical climate parameters for the coating's professional: surface, air & dewpoint temperatures, %RH & ΔT.	Up to 40% faster than other coating thickness gauges, the new Elcometer 456 provides you with accurate and repeatable readings. Integral & separate probes available.	ElcoMaster™ 2.0 is the simple yet powerful software solution; combining all your inspection results instantly in one professional report.
See page 120	See page 150	See page 182	See page 264

Adhesion

From the largest man-made structures to the smallest household appliances, most manufactured products have a protective or cosmetic coating. Premature failure of this coating can, at the very least, result in additional costs of rework.

Adhesion testing after the coating process will quantify the strength of the bond between substrate and coating, or between different coating layers or the cohesive strength of some substrates. Routine testing is used as part of inspection and maintenance procedures to help detect potential coating failures.

Adhesion Methods

- **Pull Off Adhesion Method:**

    Simple to use, quantitative range giving a definitive adhesion value, ideal for the laboratory or field on flat or curved substrate applications.Tensile Dollies (or stubs) are glued to the coating and, when the adhesive has cured, the force required to pull the coating off the surface is measured.

- **Push Off Adhesion Method:**

    A dolly is adhered to the coating. When the adhesive has cured, the dolly is pushed off the surface by the adhesion tester. The push-off design makes this method ideal for flat and curved surfaces.

- **Cross Hatch/Cross Cut Method:**

    A fast, low cost, visual comparison method for paint and powder coatings up to a thickness of 250µm (10mils). The coating is cut into small squares, thereby reducing lateral bonding, and the adhesion assessed against ISO, ASTM or Corporate Standards.

When selecting an adhesion gauge, it is important to use the same inspection test methods throughout the inspection to ensure accurate comparisons.

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Elcometer 106

Pull Off Adhesion Tester Scale

This easy to operate and fully portable Type II adhesion gauge provides a numerical value for adhesion. Applications include paint or plasma spray on bridge decking, coatings on steel, aluminium, concrete etc.

- Supplied in a carry case - ideal for site tests
- Hand operated - no need for a power supply
- Includes a cutter for EN13144 and ISO 4624 tests

STANDARDS:
AS 1580.408.5, ASTM D 4541, AS/NZS 1580.408.5, EN 13144, EN 24624, ISO 4624, ISO 16276-1, JIS K 5600-5-7, NF T30-062, NF T30-606

Test Method

A test dolly is bonded to the coating using an adhesive. The Elcometer 106 houses a spring arrangement which applies a lift force to the dolly as the tension is increased.

When the coating is pulled off the surface, an indicator on the scale shows the numerical value of adhesion expressed in terms of the force per unit area required to remove the dolly.

Inspection of the dolly face is required to determine the failure mode.

Technical Specification   C

Part Number	Description	Range			Certificate
		MPa (N/mm²)	kg/cm²	psi	
F106----5	Elcometer 106 Adhesion Tester - Scale 5	0 - 0.2	0 - 2	0 - 30	○
F106----1	Elcometer 106 Adhesion Tester - Scale 1	0 - 3.5	0 - 35	0 - 500	○
F106----2	Elcometer 106 Adhesion Tester - Scale 2	0 - 7.0	0 - 70	0 - 1000	○
Dimensions	Scales 1, 2, 5: 152 x 76mm (6 x 3")				
Dolly Diameter	20mm (0.76")				
Dolly Area	314mm² (0.49 sq inch)				
Gross weight of Kit	Scale 1, 2 and 5: 2.1kg (4.7lb) Scale 3: 3.4kg (7.5lb) Scale 4: 3.6kg (8.0lb)				
Packing List	Elcometer 106 Pull Off Adhesion Tester, pack of 20 dollies, Araldite adhesive, base support ring, magnetic dolly clamp, dolly cutter, carry case and operating instructions				

Accessories

T1062895-10	Spare Dollies 20mm (0.76") Diameter (Pack of 10)
T1062895-	Spare Dollies 20mm (0.76") Diameter (Pack of 100)
T1062914-	Large Dollies 40mm (1.52") Diameter (Pack of 5)
T1062915-	Large Base Ring for 40mm (1.52") Dollies
T99912906	Araldite Epoxy Adhesive
T99914009	20mm (0.76") Dolly Cutter

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCF106----5 is the certificate for model F106----5).

elcometer®

Pull Off Adhesion Tester Scale

This easy to operate and fully portable Type II adhesion gauge provides a numerical value for adhesion. Applications include paint or plasma spray on bridge decking, coatings on steel, aluminium, concrete etc.

• Supplied in a carry case - ideal for site tests
• Hand operated - no need for a power supply
• Includes a cutter for EN13144 and ISO 4624 tests

STANDARDS:
AS 1580.408.5, ASTM D 4541, AS/NZS 1580.408.5, EN 13144, EN 24624, ISO 4624, ISO 16276-1, JIS K 5600-5-7, NF T30-062, NF T30-606

Technical Specification   C

Part Number	Description	Range MPa (N/mm²)	kg/cm²	psi	Certificate
F106----3	Elcometer 106 Adhesion Tester - Scale 3	0 - 15	0 - 150	0 - 2000	○
F106----4	Elcometer 106 Adhesion Tester - Scale 4	0 - 22	0 - 220	0 - 3200	○
Dimensions	Scales 3 and 4: 150mm				
Dolly Diameter	20mm (0.76")				
Dolly Area	314mm² (0.49 sq inch)				
Gross weight of Kit	Scale 1, 2 and 5: 2.1kg (4.7lb) Scale 3: 3.4kg (7.5lb) Scale 4: 3.6kg (8.0lb)				
Packing List	Elcometer 106 Pull Off Adhesion Tester, pack of 20 dollies, Araldite adhesive, base support ring, magnetic dolly clamp, dolly cutter, ratchet spanner, carry case and operating instructions				

Accessories

T1062895-10	Spare Dollies 20mm (0.76") Diameter (Pack of 10)
T1062895-	Spare Dollies 20mm (0.76") Diameter (Pack of 100)
T1062914-	Large Dollies 40mm (1.52") Diameter (Pack of 5)
T1062915-	Large Base Ring for 40mm (1.52") Dollies
T99912906	Araldite Epoxy Adhesive
T99914009	20mm (0.76") Dolly Cutter

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCF106----5 is the certificate for model F106----5).

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Elcometer 1940/1941

PAT™ Adhesion Testers

This portable range of Type VI hydraulic adhesion testers provides users with the ability to measure the bond strength of coatings on a wider range of substrates. With the unique testing head design, each gauge ensures a perpendicular (90°) pull irrespective of the surface contours or orientation.

Each gauge has the ability to test adhesion up to a force of 40kN. Adhesion ranges of up to 120MPa (17400psi) can be achieved depending on the test head / dolly diameter combination chosen.

Each test head is fully interchangeable with the base unit allowing the gauge to meet all your adhesion requirements.

Features:
- Portable and simple to use
- Produces comparable test results in the laboratory and on site
- Precision gauge with both MPa (N/mm²) and psi readings
- A wide range of dolly sizes are available from 8.2mm (0.32") to 70mm (2.76") diameter

For a complete range of spares, accessories and test dollies, (see pages 211 - 212.)

STANDARDS:

ASTM D 4541, ASTM D 7234, BS 1881-207, DIN 1048-2, EN 1542, EN 12636, EN 13144, EN 24624, EN 1348, ISO 4624, ISO 16276-1, JIS K 5600-5-7, NF T30-606, NF T30-062

Technical Specification		C
Part Number	Description	Certificate
K0001940M001	Elcometer 1940 PAT™Adhesion Tester Unit with 6.3kN Test Head Scale Range 6.3kN (1416lbf)	●
K0001941M001	Elcometer 1941/1 PAT™ Adhesion Tester Unit with 20kN Test Head Scale Range 20kN (4496lbf)	●
K0001941M002	Elcometer 1941/2 PAT™ Adhesion Tester Unit with 40kN Test Head Scale Range 40kN (8992lbf)	●
Weight of Tester	1250g (45oz)	
Weight in Case	11kg (24.25lb)	
Dimensions	400 x 300 x 170mm (16 x 12 x 7")	
Accuracy	±1% of full scale	
Packing List	Elcometer 1940/1 PAT™Adhesion Tester, 6.3kN test head, 5 x 20mm dollies, heating element, hydraulic cable and operating instructions	
	Elcometer 1941/1 PAT™Adhesion Tester, 20kN test head, adaptor for 50, 70 and 50 x 50mm dollies, large support ring for 50,70 and 50 x 50mm dollies, cutting tool, hydraulic cable and operating instructions	
	Elcometer 1941/2 PAT™Adhesion Tester, 40kN test head, adaptor for 50, 70 and 50 x 50mm dollies, large support ring for 50,70 and 50 x 50mm dollies, cutting tool, hydraulic cable and operating instructions	

● Calibration Certificate supplied as standard.

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PAT Adhesion Dollies & Accessories

Elcometer 1940/1941

A wide range of dolly sizes are available in order to meet specific measurement requirements from 8.2mm (0.32") to 70mm (2.76") in diameter. The test head chosen determines both the size of dollies that can be used and the gauge's adhesion range.

Certain test head and dolly size combinations require additional adaptors and/or support rings, as indicated in the tables below. A number of dolly cutting tools are also available.
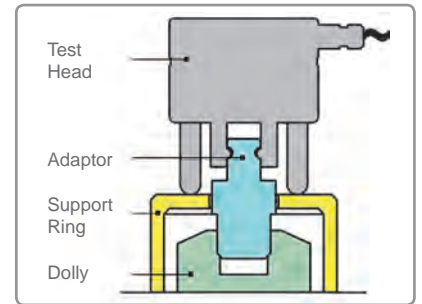
6.3kN (1416lbf) Test Head Dollies & Accessories

| Part Number | | | | | |
Pack of 10	Pack of 100	Description[a]	Range	Adaptor	Support Ring
KT001910P004	KT001910P204	8.2mm (0.32") Dolly	0 -120MPa (17300psi)	KT001910P401♦	KT001910P108*
KT001910P005	KT001910P205	14.2mm (0.56") Dolly	0 - 40MPa (5800psi)	-	KT001910P109*
KT001910P006	KT001910P206	20.0mm (0.79") Dolly	0 - 20MPa (2900psi)	-	KT001910P110*
KT001910P010	KT001910P210	28.2mm (1.11") Dolly	0 - 10MPa (1470psi)	-	KT001910P111*
KT001910P012	KT001910P212	50.0mm (2.00") Dolly	0 - 3.2MPa (460psi)	KT001910P406♦	KT001910P101♦[1] or KT001910P123♦[3]
KT001910P018	KT001910P218	70.0mm (2.76") Dolly	0 - 1.6MPa (240psi)	KT001910P406♦	KT001910P123♦[3]
KT001910P016	KT001910P216	50x50mm (2x2") Dolly	0 - 2.5MPa (370psi)	KT001910P406♦	KT001910P123♦[3]

20kN (4496lbf) Test Head Dollies & Accessories

| Part Number | | | | | |
Pack of 10	Pack of 100	Description[a]	Range	Adaptor	Support Ring
KT001910P007	KT001910P207	25.0mm (0.98") Dolly	0 - 40MPa (5800psi)	KT001910P407♦	-
KT001910P012	KT001910P212	50.0mm (2.00") Dolly	0 - 10MPa (1470psi)	KT001910P408♦	KT001910P101♦[1] or KT001910P123♦[3]
KT001910P018	KT001910P218	70.0mm (2.76") Dolly	0 - 5MPa (750psi)	KT001910P408♦	KT001910P123♦[3]
KT001910P016	KT001910P216	50x50mm (2x2") Dolly	0 - 8MPa (1160psi)	KT001910P408♦	KT001910P123♦[3]

*Optional   ♦Required   [1]Standard - 50mm (1.97")   [2]Large - 70mm (2.76")   [3]Adjustable - for 50 x 50mm and 70mm dollies

[a]All dimensions given are the dolly diameter

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Elcometer 1940/1941   PAT Adhesion Dollies & Accessories

40kN (8892lbf) Test Head Dollies & Accessories

Part Number		Description[a]	Range	Adaptor	Support Ring
Pack of 10	Pack of 100				
KT001910P007	KT001910P207	25.0mm (0.98") Dolly	0 - 80MPa (11800psi)	-	-
KT001910P012	KT001910P212	50.0mm (2.00") Dolly	0 - 20MPa (2950psi)	KT001910P409♦	KT001910P101♦1 or KT001910P123♦3
KT001910P018	KT001910P218	70.0mm (2.76") Dolly	0 - 10MPa (1470psi)	KT001910P409♦	KT001910P123♦3
KT001910P016	KT001910P216	50x50mm (2x2") Dolly	0 - 16MPa (2320psi)	KT001910P409♦	KT001910P123♦3

*Optional   ♦Required   1Standard - 50mm (1.97")   2Large - 70mm (2.76")   3Adjustable - for 50 x 50mm and 70mm dollies

[a]All dimensions given are the dolly diameter

Accessories   C

Part Number	Description	Suitable for use with		Certificate^
		Elcometer 1940	Elcometer 1941	
KT001910P501	Testing Head 6.3kN (1416lbf)	●		○
KT001910P502	Testing Head 20.0kN (4496lbf)		●	○
KT001910P503	Testing Head 40.0kN (8992lbf)		●	○
KT001910P116	8.2mm (0.32") Diameter Dolly Cutting Tool	●		
KT001910P117	14.2mm (0.56") Diameter Dolly Cutting Tool	●		
KT001910P118	20.0mm (0.79") Diameter Dolly Cutting Tool	●		
KT001910P119	25.0mm (0.98") Diameter Dolly Cutting Tool		●	
KT001910P120	28.2mm (1.11") Diameter Dolly Cutting Tool	●		
KT001910P122	50.0mm (2.00") Diameter Dolly Cutting Tool		●	

^ Calibration Certificate is for specific main unit & test head combination

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCKT001910P501 is the certificate for model KT001910P501).

elcometer.

PAT*Handy*™ Adhesion Tester

The Elcometer 1910 is an easy to use, lightweight Type VI hydraulic adhesion tester which applies an increasing level of pull off force to a dolly adhered to the surface under test simply by turning the handle.

The special test head has self adjusting legs, which ensure that the pull off force is applied perpendicular (90°) to the substrate - even on rough or uneven surfaces.

A wide range of dolly sizes is available in order to meet specific measurement requirements from 8.2mm (0.32") to 70mm (2.76") in diameter. Depending upon the size of the dolly and application, a dolly adaptor and support ring may be required. Square dollies are also available.

STANDARDS:

ASTM D 4541, AS/NZS 1580.408.5, EN 13144, EN 24624, ISO 4624, ISO 16276-1, JIS K 5600-5-7, NF T30-062

Technical Specification		C
Part Number	Description	Certificate
K0001910M001	Elcometer 1910 PAT*Handy*™ Adhesion Tester	●
Packing List	Elcometer 1910 PAT*Handy*™ Adhesion Tester, 6.3kN Head, crank handle driven pull mechanism, 5 x 20mm (0.79") diameter dollies, cutting tool for 20mm (0.79") diameter dollies, hydraulic cable, carry case with protective interior and calibration certificate	

Accessories

Part Number Pack of 10	Pack of 100	Description[a]	Range	Adaptor	Support Ring
KT001910P004	KT001910P204	8.2mm (0.32") Dolly	0 -120MPa (17300psi)	KT001910P401♦	KT001910P108*
KT001910P005	KT001910P205	14.2mm (0.56") Dolly	0 - 40MPa (5800psi)	-	KT001910P109*
KT001910P006	KT001910P206	20.0mm (0.79") Dolly	0 - 20MPa (2900psi)	-	KT001910P110*
KT001910P010	KT001910P210	28.2mm (1.11") Dolly	0 - 10MPa (1470psi)	-	KT001910P111*
KT001910P012	KT001910P212	50.0mm (2.00") Dolly	0 - 3.2MPa (460psi)	KT001910P406♦	KT001910P101♦[1] or KT001910P123♦[3]
KT001910P018	KT001910P218	70.0mm (2.76") Dolly	0 - 1.6MPa (240psi)	KT001910P406♦	KT001910P123♦[3]
KT001910P016	KT001910P216	50x50mm (2x2") Dolly	0 - 2.5MPa (370psi)	KT001910P406♦	KT001910P123♦[3]

PAT Handy™ Adhesion Tester

The special test head has self adjusting legs, which ensure that the pull off force is applied perpendicular (90°) to the substrate - even on rough or uneven surfaces.

*Optional ♦Required [1]Standard - 50mm (1.97") [2]Large - 70mm (2.76") [3]Adjustable - for 50 x 50mm and 70mm dollies
[a]All dimensions given are the dolly diameter

● Calibration Certificate supplied as standard.

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Elcometer 106/6

Coatings on Concrete Adhesion Tester

The Elcometer 106/6 Adhesion Tester has been specifically designed to measure coatings on concrete.

Operating in a similar way to the regular Elcometer 106 Adhesion Tester, the Elcometer 106/6 allows for a 50mm (2") diameter dolly for testing coatings on concrete.

• Fully portable and is supplied in a carry case - ideal for site tests

STANDARDS:
ASTM D 7234, BS 1881-207, DIN 1048-2, EN 1542, EN 12636

Technical Specification

Part Number	Description	Certificate
F106----6	Elcometer 106 Coatings on Concrete Adhesion Tester - Scale 6	○
Range	0 - 3.5MPa (N/mm²) 0 - 500psi	
Dimensions	505 x 370 x 120mm (19.9 x 14.6 x 4.7")	
Packing List	Elcometer 106/6 Coatings on Concrete Adhesion Tester, 5 x 50mm (2") dollies, support ring, Araldite adhesive, ratchet spanner, carry case and operating instructions	

Accessories

T10618570	50mm (2") Diameter Dollies (Pack of 5)	T99912906	Araldite Epoxy Adhesive
KT001910P122	50.0mm (2.00") Diameter Dolly Cutting Tool		

Coating Adhesion Testing on Concrete
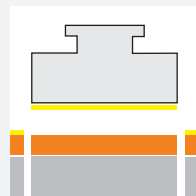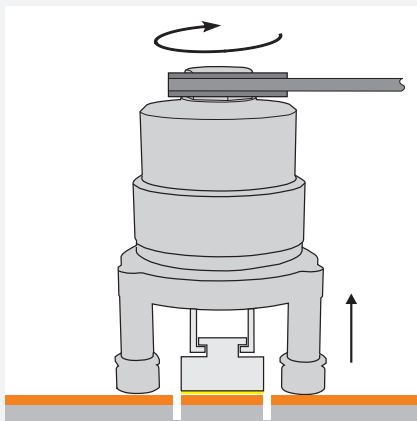
Adhesive Failure
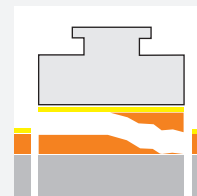
Partial Coating Failure
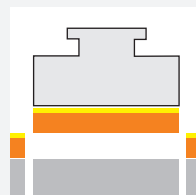
Coating Failure
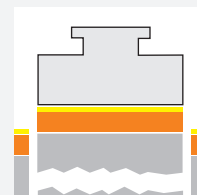
Concrete Failure

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCF106----6 is the certificate for model F106----6).

elcometer.

Adhesion

Hydraulic Adhesion Testers

Elcometer 108

The Elcometer 108 Hydraulic Adhesion Tester is an extremely versatile Type III adhesion gauge which can be used for many adhesion requirements. Tests can be made on flat or curved (concave and convex) surfaces.

The Elcometer 108 is the ideal gauge for coatings on Tanks, Pipelines, etc.

• Hand-Powered and portable
• Ideal for site work
• Reusable stainless steel dollies

Elcometer Digital Adhesion Gauge features:

• Maximum hold - displays the highest value reached
• Backlit display for dark areas
• Rubber protective casing
• Switchable Metric/Imperial

The Elcometer 108 can be used with convex and concave dollies, making this the gauge for adhesion of coatings on all pipelines including those with small diameter, tanks and other curved surfaces. There is a wide range of curved dollies available, each designed for a specific range of curvature.

STANDARDS:
ASTM D 4541, ISO 16276-1, NF T30-606

Technical Specification   C

Part Number		Description	Certificate
UK 240V/EUR 220V	US 110V		
F108---1D	F108---1C	Elcometer 108/1 Hydraulic Adhesion Tester - Analogue Dial Gauge	○
F108---2D	F108---2C	Elcometer 108/2 Hydraulic Adhesion Tester - Digital Gauge	○
Analogue Instrument Range		Operating: 0 - 18MPa (0 - 2600psi)	
Analogue Instrument Accuracy		±1MPa Metric Scale; 150psi (Imperial Scale)	
Digital Instrument Range		Operating: 0 - 18MPa (0 - 2600psi)	
Digital Instrument Accuracy		±3% or 60psi (whichever is the greater)	
Dolly Size	Outside Diameter	19.4mm (0.76")	
	Inside Diameter	3.7mm (0.15")	
	Area	284mm² (0.44sq.inch)	
Packing List		Elcometer 108, ABS carry case, 5 flat dollies, 5 nylon plugs, MC1500 quick curing adhesive, dolly cleaning tool, heating tongs	

Accessories

T99911135	Cyanoacrylate Adhesive
T1089646-	Standard Flat Dolly 19.4mm (0.76")

Concave & Convex dollies are available upon request

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCF108---1B is the certificate for model F108---1B).

Elcometer 1970

PFCV - Portable Field Calibration Verification Unit

The Elcometer 1940 Portable Field Calibration Verification Units is for use with the Elcometer PAT™, Elcometer 106 and the Elcometer 108 Adhesion Testers, this Portable Field Calibration Verification Unit is ideal for confirming your adhesion gauge calibration.

Connect the appropriate pull stub to the unit, pull your adhesion tester and compare the adhesion tester reading to the reading on the Portable Calibration Unit's Display.

Technical Specification

Part Number	Description
K0001970M001	Elcometer 1970 PFCV Unit
Calibration Range	0 - 17 MPa (5.3kN) on 20mm (0.79") diameter dolly
Accuracy	Within ±1% of full scale
Weight	2.4kg (5.3lb)

Accessories

KT001970P001	Elcometer 106 Adaptor
KT001970P002	Elcometer 108 Adaptor

elcometer®

Cross Hatch Cutter

The Elcometer 107 Cross Hatch Cutter provides an instant assessment of the quality of the bond to the substrate. Due to its rugged construction this gauge is ideal for thin, thick or tough coatings on all surfaces. An ideal field or laboratory test.

• Robust design
• Large, non slip grip
• Ideal for thin, thick or hard coatings
• A quick change, four sided cutter allows adhesion testing on a wide range of coating thicknesses (1mm, 1.5mm, 2mm and 3mm)

The Elcometer 107 Cross Hatch Cutter is available as a Basic or Full Kit.

STANDARDS:
AS 3894.9, AS 1580.408.4, ASTM D 3359-B, BS 3900-E6, ECCA T6, EN 13523-6, ISO 2409, ISO 16276-2, JIS K 5600-5-6, NF T30-038

Technical Specification   C

Part Number	Description	Coating Thickness		Certificate
F10713222-1	Elcometer 107 Basic Kit (6 x 1mm)	0 - 60µm	0 - 2.0mils	○
F10713348-6	Elcometer 107 Full Kit with ISO Tape (6 x 1mm)	0 - 60µm	-	○
F10713348-1	Elcometer 107 Full Kit with ASTM Tape (6 x 1mm)	0 - 50µm	0 - 2.0mils	○
F10713222-2	Elcometer 107 Basic Kit (11 x 1mm)	0 - 50µm	0 - 2.0mils	○
F10713348-2	Elcometer 107 Full Kit with ASTM Tape (11 x 1mm)	0 - 50µm	0 - 2.0mils	○
F10713222-3	Elcometer 107 Basic Kit (11 x 1.5mm)	-	-	○
F10713222-4	Elcometer 107 Basic Kit (6 x 2mm)	0 - 125µm	0 - 5.0mils	○
F10713348-9	Elcometer 107 Full Kit with ISO Tape (6 x 2mm)	0 - 120µm	-	○
F10713348-4	Elcometer 107 Full Kit with ASTM Tape (6 x 2mm)	50 - 125µm	2.0 - 5.0mils	○
F10713222-5	Elcometer 107 Basic Kit (6 x 3mm)	121 - 250µm	-	○
Packing List	**Basic Kit:** Robust handle, cutter, hexagonal wrench, presentation storage case and instructions (together with Classification of Adhesion Test Results chart) **Full Kit:** Robust handle, cutter, hexagonal wrench, instructions (together with Classification of Adhesion Test Results chart), eye glass, brush and adhesive tape (either ASTM or ISO tape), all in a plastic ABS carry case			

Accessories   C

Part Number	Description	ISO	ASTM	AS	Certificate
		Methods			
T99913700-1	6 x 1mm Four sided cutter blade	●			○
T99913700-2	11 x 1mm Four sided cutter blade		●		○
T99913700-3	11 x 1.5mm Four sided cutter blade	●			○
T99913700-4	6 x 2mm Four sided cutter blade	●	●		○
T99913700-5	6 x 3mm Four sided cutter blade	●			○
K0001539M001	Adhesive Tape (1 roll) ASTM D 3359		●		
K0001539M002	Adhesive Tape (1 roll) ISO 2409	●			
T9998894-	Adhesive Tape (2 rolls) ASTM D 3359		●		
T9999358-	Adhesive Tape (2 rolls) ISO 2409	●			

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCT99913700-1 is the certificate for model T99913700-1).

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Elcometer 1542

Cross Hatch Adhesion Tester

The Elcometer 1542 Cross Hatch Adhesion Tester is a simple but effective method for determining the adhesion of coatings. The instrument is ideal for coatings on flat surfaces and is available with one of three different spacings;

- 1mm spacing - for coating thickness < 60µm (2.4mils)
- 2mm spacing - for coating thickness < 125µm (5.0mils)
- 3mm spacing - for coating thickness < 250µm (9.8mils)

Each gauge can be supplied separately or combined in a kit with a standardised brush and x10 magnifier.

- Efficient cross hatch cutter with 8 cutting faces
- Anodised aluminium handle with a wheel for stable operation, ideal for test panels
- Supplied with an adjustment gauge for accurate positioning of the cutter face

STANDARDS:
AS 3894.9, AS 1580.408.4, ASTM D 3359-B, BS 3900-E6, ECCA T6, EN 13523-6, ISO 2409, ISO 16276-2, JIS K 5600-5-6, NF T30-038

Technical Specification   C

Part Number	Description	Coating Thickness		Certificate
K0001542M001	Elcometer 1542 Cross Hatch Adhesion Tester (6 x 1mm)[1]	0 - 60µm	0 - 2.4mils	○
K0001542M002	Elcometer 1542 Cross Hatch Adhesion Tester (6 x 2mm)[2]	50 - 125µm	2.0 - 5.0mils	○
K0001542M003	Elcometer 1542 Cross Hatch Adhesion Tester (6 x 3mm)[3]	121 - 250µm	4.8 - 9.8mils	○
K0001542M201	Elcometer 1542 Cross Hatch Adhesive Kit (6 x 1mm)[1]	0 - 60µm	0 - 2.4mils	○
K0001542M202	Elcometer 1542 Cross Hatch Adhesive Kit (6 x 2mm)[2]	50 - 125µm	2.0 - 5.0mils	○
K0001542M203	Elcometer 1542 Cross Hatch Adhesive Kit (6 x 3mm)[3]	121 - 250µm	4.8 - 9.8mils	○
K0001542M204	Elcometer 1542 Cross Cut Kit including 3 Cross Hatch Cutters[2]			○
Weight	200g (0.44lb)			
Dimensions	150 x 25 x 35mm (6 x 1 x 1.25")			
Packing List	Cross Hatch Cutter, adjustment gauge for setting cutting blades, hexagonal wrench, brush, magnifying glass, carry case and operating instructions			

Accessories

Part Number	Description	Methods			
		ISO	ASTM	AS	Certificate
KT001542P001	6 x 1mm Cross Hatch Wheel	•	•		○
KT001542P002	6 x 2mm Cross Hatch Wheel	•	•	•	○
KT001542P003	6 x 3mm Cross Hatch Wheel	•			○
KT001542F006	Cutter Angle Adjustment Gauge				
K0001539M002	ISO 2409 Adhesive Tape (1 roll)				
T9999358-	ISO 2409 Adhesive Tape (2 rolls)				
K0001539M001	ASTM D3359 Adhesive Tape (1 roll)				
T9998894-	ASTM D3359 Adhesive Tape (2 rolls)				
T10713357	Cross Cut DIN Brush				
KT001546N002	Magnifier (x10)				

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCKT001542P002 is the certificate for model KT001542P002).

elcometer®

Cross Cut Tester

Elcometer 1540

The Elcometer 1540 is a simple instrument for quickly determining the adhesion of a large variety of paints up to 50µm (2 mils) thickness.

Made from steel, it has 11 tapered teeth with 1mm spacing. Two sets of lines are cut at right angles to obtain a pattern of 100 squares.

Results are determined by the table below.

Technical Specification		C
Part Number	Description	Certificate
K0001540M001	Elcometer 1540 Cross Cut Tester (11 x 1mm)	○

Classification of Cross Hatch Test Results

Surface	Typical description of result	ISO	ASTM
	The edges of the cuts are completely smooth, none of the squares of the lattice is detached.	0	5B
	Detachment of small flakes of the coating at the intersections of the cuts. A cross cut area not significantly greater than 5%, is affected.	1	4B
	The coating has flaked along the edges and/or at the intersections of the cuts. A cross cut area significantly greater than 5%, but not significantly greater than 15%, is affected.	2	3B
	The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and/or it has flaked partly or wholly on different parts of the squares. A cross cut area significantly greater than 15%, but not significantly greater than 35%, is affected.	3	2B
	The coating has flaked along the edges of the cuts in large ribbons and/or some squares have detached partly or wholly. A cross cut area significantly greater than 35%, but not significantly greater than 65%, is affected.	4	1B
	Any degree of flaking that cannot be classified even by classification 4 (1B).	5	0B

Images and descriptions based on information published in ISO2409 and ASTM D 3559-B

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCK0001540M001 is the certificate for model K0001540M001).

elcometer®
inspection equipment

ELCOMETER 280
PULSED HOLIDAY DETECTOR

Making pulsed DC holiday detection safer, easier and more reliable

Rugged, shockproof and water resistant, the Elcometer range of DC, Pulsed DC, and Low Voltage Holiday Detectors are designed to meet the most exacting specifications. Ergonomic features and interchangeable probes make Elcometer's range the most versatile in the industry.

Pinhold Detection	**DC Holiday Detection**	**Pulsed Holiday Detection**	**Adaptors & Accessories**
The Elcometer 270 sets the standard for wet sponge detectors - high quality, low voltage detectors with a range of accessories to meet your requirements.	The Elcometer 266 High Voltage DC holiday detector's menu allows access to every major International Standard and automatically sets the required parameters.	The new Elcometer 280 Pulsed DC holiday detector with three grounding options makes pipeline inspection faster and safer than ever before.	Elcometer offers a wide range of versatile accessories designed to meet every application and adaptors to work with your current brushes and probes.
See page 222	See page 228	See page 224	See page 232

Pinhole & Porosity

Premature corrosion of a substrate is usually due to a coating failure. A major cause is the presence of flaws in the finished coating.

Collectively referred to as porosity, the main types of flaws are:

Runs & Sags: Coatings move under gravity leaving a thin dry film.

Cissing: When a coating does not re-flow to cover the voids generated by air bubbles being released from the surface of a coating.

Cratering: If the substrate is wet or the coating has poor flow characteristics, voids are created in the coating.

Pinholes: Caused by air entrapment which is then released from the surface, or by the entrapment of particulates (dust, sand etc.) which do not stay in place.

Over Coating: If too much coating is applied, as it cures internal stresses of the coating can cause it to crack.

Under Coating: Un-coated areas, or where the coating flows away from edges or corners of a substrate or welds. Insufficient coating over a rough surface profile may also leave the peaks of the profile exposed.

There are, essentially, three flaw detection methods in our range:

Wet Sponge Technique: A low voltage is applied to a moist sponge. When the sponge moves over a coating flaw, liquid penetrates to the substrate and completes an electrical circuit, setting off the alarm. The wet sponge technique is suitable for measuring insulating coatings less than 500µm (20mils) on conductive substrates, and is ideal for powder coatings and other coatings where the user does not wish to damage the coating.

High Voltage Technique: The high voltage, or porosity technique, can be used to test coatings up to 25mm (1") thick and is ideal for inspecting pipelines and other protective coatings. Coatings on concrete can also be tested using this method.
A power supply generates a high voltage DC or pulsed DC to a probe. As the probe passes over a flaw, a spark at the contact point sets off the alarm. This technique is suitable for locating the types of flaws described above, although care is required on thin coatings.

UV Pinhole Detection: UV light can be used as a low cost, quick method of detecting pinholes in coatings. A base coat containing a UV fluorescing additive is applied. When the UV flashlight shines on the coating, areas where the base coat is not covered fluoresce, identifying the location of the pinhole.

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Elcometer 270

Pinhole Detector

The Elcometer 270 range utilises the wet sponge technique and sets the standard for wet sponge detectors - high quality, low voltage detectors with a wide range of accessories to meet your requirements.

Visual and audible alarms indicate a pinhole

A wide range of wand accessories available

Each unit can be converted into a separate wand with base unit using the separate wand adaptor

User selectable voltages: 9V, 67.5V or 90V

Easy release, snag proof cables - available in 4m (13'2") & 10m (32'10") lengths

Automatic internal voltage check ensures that the selected voltage can be achieved

Pinhole Detector

Accessories

Standard wand — T27016867
A universal flat sponge to suit almost all applications

Spare flat sponge set — T27018050
Pack of 3 sponges;
150 x 60 x 25mm (6 x 2.3 x 1")

Roller sponge wand — T27016960
Ideal for large flat surface inspection

Spare roller sponge — T27018051

Separate wand adaptor — T27016999
with belt clip - converts the gauge into a separate pinhole detector

Telescopic wand adaptor — T27016998
with belt clip - extends to 1m(39"), ideal for floors or high areas

Extension piece — T27016965
420mm (16.5") extensions to expand operators reach
Additional extension pieces can be connected to each other

Pinhole Inspector's Kit — T27018191
The complete pinhole detection kit.
Each kit is supplied with:
1 x separate wand handle & lead
1 x roller wand
1 x 10m (32') signal return cable
2 x extension pieces,
1 x telescopic extension
1 x belt clip
1 x bottle of wetting agent
3 x AA batteries
1 x spare flat sponge
1 x spare roller sponge
The kit does not include the main instrument; just add the model number to the order

Return cable - 4m (13') — T99916954
supplied as standard, complete with crocodile clip and plug

Return cable - 10m (32') — T99916996
supplied on a drum, complete with clip and connection plug

Wetting agent — T27018024
50ml (1.7floz) bottle - helps aid the fast detection of pinholes. Just add to the water used to dampen the sponge

Technical Specification

Model	Elcometer 270/3	Elcometer 270/4
Part Number	D270----3	D270----4
Voltage	9V and 90V	9V, 67.5V and 90V
Maximum Measurement Range	500µm (20mils)	500µm (20mils)
Sensitivity	9V: 90kΩ ±5% 90V: 400kΩ ±5%	9V: 90kΩ ±5% 67.5V: 125kΩ ±5% 90V: 400kΩ ±5%
Battery Life (continuous use)	9V: up to 200 hours 90V: up to 80 hours	9V: up to 200 hours 67.5V: up to 100 hours 90V: up to 80 hours
Certificate	○	○
Battery Type	3 x AA (LR1600) 1.5V alkaline (NiMH rechargeable batteries can also be used, battery life will be reduced by up to 75%)	
Accuracy of Setting	±5%	
Dimensions	Without wand: 210 x 42 x 37mm (8.3 x 1.7 x 1.5") Standard wand: 175mm (6.9") long (including sponge)	
Weight	610g (21oz) including wand, cable and batteries	
Packing List	Pinhole Detector, standard wand and flat sponge, 4m (13' 2") return lead with crocodile clip, 3 x AA (LR1600) batteries and operating instructions	

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCD270----3 is the certificate for model D270----3).

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Elcometer 280

Pulsed DC Holiday Detector

The Elcometer 280 is a 'stick type' holiday detector which has been designed to make pulsed DC high voltage holiday detection safer, easier and more reliable than ever before.

Using state of the art electronics, the Elcometer 280 allows users to inspect coatings - without connecting the earth return lead to the component substrate - ideal for inspecting large surfaces and pipelines.

Flashing display, bright LED and a user adjustable volume alarm indicates detection of a holiday

0.5 - 35kV range (user selectable) for detecting porosity in coatings up to 25mm (1") thick

Safety trigger integrated inside the handle cuts power if released

Rugged, shock proof and water resistant design to ensure long life - even in harsh environments

Balanced, ergonomic design, complete with shoulder strap allows long periods of continuous use

Pulsed DC Holiday Detector

A wide range of interchangeable probe accessories available - compatible with all Elcometer holiday detectors

Ideal for testing clean, damp, dirty or slightly conductive coatings

Voltage calculator automatically sets the correct voltage from your coating thickness value

Internal jeep tester ensures that the selected voltage equals the test voltage

The Elcometer 280 uses the high voltage pulsed DC technique to detect holidays in coatings - even if the coating is damp, dirty or slightly conductive.

From the two stage safety switch, bright LED's and screen icons signifying when the high voltage is on, to the extended ribbing to protect the user from spark creep, the Elcometer 280 sets the standard for high voltage measurement safety.

Using the wide range of probe accessories users can detect porosity/holidays in coatings up to 25mm (1") thick.

Rugged, shockproof and water resistant, each unit is designed for use even in the harshest of environments.

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Elcometer 280   Key Features

Red LED indicates high voltage ON

Earth signal return lead disconnected icon

Porosity Detector overload icon
indicates that the unit cannot obtain selected voltage with current accessory / coating combination

Calculation softkey
select relevant standard & coating thickness value

Voltage adjustment softkey
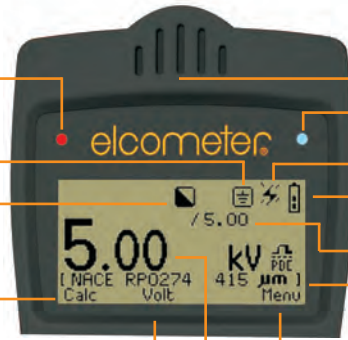
Waterproof buzzer

Blue LED flashes as holidays are detected

Holiday detected icon

Battery symbol indicating remaining charge

Voltage selected

Porosity standard in use
used in conjunction with setting the coating thickness within the Voltage Calculator

Menu softkey

Voltage level achieved at probe

Specialised extended ribbing
designed to standard EN61010, ribs provide additional protection to the user during use

Integrated safety trigger switch
switches off the high voltage if released

Quick release battery pack
fully charged in 4 hours, provides up to 30+ hours of continuous use*

Earth return lead socket
including ¼ turn lock/release to ensure connection during testing

Rubberised second hand grip
provides greater control and balance during testing

Large, waterproof buttons
ideal for use - even in gloves

Shoulder harness point
strap can be quickly clipped on as required

Clear, backlit LCD display
shows all relevant information, even in dark environments

High Voltage ON/OFF
separate button minimises risk of accidental switch on

* the battery life is dependant on selected voltage and load applied - see Technical Specification for more information

Pulsed DC Holiday Detector

Elcometer 280

Technical Specification			C
Description	Model S	Model T	Certifcate
Elcometer 280 Pulsed DC Holiday Detector	D280-S----	D280-T----	○
Elcometer 280 Pulsed DC Holiday Detector Inspection Kit	D280-S-KIT	D280-T-KIT	○
Rugged, Shockproof & Water Resistant	■	■	
Integrated Safety Trigger Switch	■	■	
Quick Release Battery Pack	■	■	
Internal Jeep Tester	■	■	
Integrated Voltage Calculator		■	
Pulsed DC High Voltage Range	0.5kV - 35kV		
Voltage Adjustment	User adjustable: 0.5 - 1kV: 10 Volt steps, 1 - 35kV: 100V steps		
High Voltage Output Accuracy	±5% or ±50V below 1000 Volts		
Pulse Repetition Rate	~30Hz		
Operating Temperature	0°C to 50°C (32°F to 120°F)		
Power Supply	Rechargeable lithium ion battery, fully charged within 4 hours		
Typical Battery Life	Battery life is dependant upon selected voltage and load applied; 12" (DN305) Rolling Spring: 30 hours at 10kV; 12 hours at 35kV 40" (DN1016) Rolling Spring: 22 hours at 10kV; 8 hours at 35kV		
Instrument Case Dimensions	PC ABS case; (l x w x h): 603 x 219 x 193mm (23.7 x 8.6 x 7.6")		
Weight (no probes attached)	3.0kg (6.6lb) - including battery pack		
Packing List	**Elcometer 280 Pulsed DC Holiday Detector** Gauge (Model S or T), 5m (16') trailing signal return lead, battery pack, battery charger with mains cables (UK, EUR and US), shoulder strap and operating instructions **Elcometer 280 Pulsed DC Holiday Detector Inspection Kit** Gauge (Model S or T), 5m (16') trailing signal return lead, battery pack (2 supplied with Model T), battery charger with mains cables (UK, EUR & US), stainless steel rolling spring holder (supplied with Model T only), 250mm (9.8") probe extension shaft, shoulder strap and operating instructions - packed in a light weight, rugged, wheeled transit case - ideal for transportation		

Accessories	
Light weight, rugged, wheeled transit case - ideal for gauge transportation, with additional space to house up to 20m (66') of phosphor bronze or 6m (30') of stainless steel rolling spring	T28022769
Grounding mats are ideal for testing on un-grounded pipes. The conductive rubber mat is wrapped around the coated pipe and connected to both the grounding pin (supplied separately) and the signal return lead.	
750mm (29.5") long - for pipe diameters up to 9" (NPS)/ 229mm (DN)	T28022637-1
1500mm (59") long - for pipe diameters up to 18" (NPS)/ 457mm (DN)	T28022637-2
2500mm (98.5") long - for pipe diameters up to 30" (NPS)/ 762mm (DN)	T28022637-3
3500mm (137.5") long - for pipe diameters up to 42" (NPS)/ 1067mm (DN)	T28022637-4
Grounding pin; 60cm (23.5") long x 0.2cm (0.75") diameter	T28022748
Trailing signal return lead, 5m (16')	T28022622
10m (32') earth lead, clips each end (for use with the grounding mat)	T28022749
10m (32') earth lead, clip / Elcometer 280 connector (for use with the grounding mat)	T28022750

For a full range of rolling springs, rubber or wire brush probes and other accessories see pages 232 - 236

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCD280-S-KIT is the certificate for model D280-S-KIT).

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Elcometer 266

Holiday Detector

The Elcometer 266 revolutionises High Voltage DC testing of coatings porosity detection making it safer, easier and more reliable than ever before.

STANDARDS:

ANSI/AWWA C213, AS 3894.1, ASTM C 536, ASTM C 537, ASTM D 4787, ASTM D 5162-B, ASTM G 62-B, BS1344-11, DIN 55670, EN 14430, ISO 2746, ISO 29601, JIS K 6766, NACE RP0274, NACE RP0188, NACE RP0190, NACE RP0490, NACE SP0188, NACE SP0490

Voltage calculator automatically sets the correct voltage from your coating thickness value

A wide range of probe brushes and rolling springs available

Adjustable Voltage:
0.5kV - 1kV in 50V steps
1kV to 30kV in 100V steps

To change maximum voltage range, select a different handle; 5kV, 15kV or 30kV DC

Visual and audible holiday alarms Bright LEDs on the handle, as well as a loud buzzer, clearly indicate when a holiday is detected

Internal Voltmeter/Jeep tester ensures that the test voltage equals the selected voltage

Dual safety switch on handle to avoid accidental switch on

Key Features

Interchangeable DC probe handles

Part Number	Description
T26620033-1	DC5 (0 - 5kV)
T26620033-2	DC15 (0 - 15kV)
T26620033-3	DC30 (0 - 30kV)
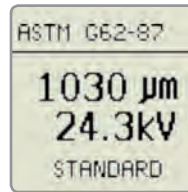
Integrated voltage calculator
Enter the test standard & the coating thickness then the gauge will automatically programme the correct voltage

ASTM G62-87
1030 µm
24.3kV
STANDARD

Testing has never been safer
Ribbing provides additional user protection - specifically designed to meet EN 61010

Second hand grip is available
Ideal for testing pipes and tank floors with 2 hands - without compromising safety

Part Number	Description
T26620081	Second Hand Grip

Removeable, quick charge batteries
Fully charge the battery pack in 4 hours, within the gauge or separately, for up to 40 hours of continuous testing.

Part Number	Description
T99923482	Rechargeable lithium ion battery pack

Universal probe adaptors
Enables the Elcometer 266 to work with all major holiday detector's accessories
For the complete range of adaptors see page 232

Technical Specification   C

Description	Part Number	Certificate
Elcometer 266*	D266----4	o
High Voltage Output Accuracy	±5% or ±50V below 1000 Volts	
Operating Temperature	0°C to 50°C (32°F to 120°F)	
Power Supply	Rechargeable lithium ion battery pack, fully charged within 4 hours	
Measured Current Flow Accuracy	±5% of full scale ; 0 - 100µA maximum Output Current	
Typical Battery Life - Backlight Off (On)	DC5: 40 (20) hours DC15: 20 (15) hours DC30: 10 (8) hours	
Instrument Case Dimensions	Waterproof, ABS case; 520 x 370 x 125mm (20.5 x 14.5 x 5")	
Weight	Base unit (including battery pack): 1.2kg (2.7lb) Handle: 0.6kg (1.3lb)	
Packing List	Elcometer 266 DC Holiday Detector, lithium battery, curly connection cable for high voltage handle, 10m (32') signal return lead, battery charger with 3 mains cables (UK, EUR and US), band brush, shoulder strap, tough plastic carry case and operating instructions	

*The Elcometer 266 does not include the probe handle; please select the required handle from the list below

Probe Handles   C

	DC5 (0 - 5kV)	DC15 (0 - 15kV)	DC30 (0 - 30kV)	Certificate
Elcometer 266 Probe Handle (Voltage)*	T26620033-1	T26620033-2	T26620033-3	o
Second Hand Grip	T26620081			

For a full range of rolling springs, rubber or wire brush probes and other accessories see pages 232 - 236

o   Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCD266----4 is the certificate for model D266----4).

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Elcometer 236

Holiday Detector

The Elcometer 236 Holiday Detector provides high voltage porosity testing to detect pits, flaws, holes, etc. in a wide variety of non-metallic coatings.

Standard and telescopic handles available for hard to reach areas

Available in 2 versions; 15 and 30kV; fully adjustable in 100 Volt steps

Adjustable sensitivity allows use on partially conductive surfaces

Integrated neon bulb in the handle, together with buzzer indicate when a holiday has been located

A wide range of probe brushes and springs available

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Holiday Detector

Elcometer 236

The Elcometer 236 provides the user with complete control of voltage and sensitivity settings and is available in 2 versions, 15kV and 30kV.

Each unit is supplied in a convenient carry case which also holds the probe handle and an additional (optional) external re-chargeable battery pack which doubles the testing time available.

Due to it's unique design, the probe handle can be replaced with a telescopic probe handle - extending the measurement reach up to almost 4m (13'), ideal for testing on large structures.

Technical Specification   C

	Elcometer 236 15kV Holiday Detector	Elcometer 236 30kV Holiday Detector
Part Number	D236--15KV	D236--30KV
Voltage Output	0.5 - 15kV in 100V steps	0.5 - 30kV in 100V steps
Display Resolution	0.01kV	0.1kV
Approximate Thickness Range	0 - 3.75mm (0 - 150mils)	0 - 7.5mm (0 - 300mils)
Certificate	○	○
Alarms	Audible & Visual	
Power Supply	NiMH 12V internal rechargeable battery	
Battery Life (approximate)	10/12 hours continuous use, 20/24 hours with the optional external battery pack	
Dimensions	200 x 170 x 70mm (6 x 7 x 3")	
Weight	2.8kg (6lb 3oz)	
Packing List	Elcometer 236, probe handle and lead, band brush probe, 2m (79") & 10m (394") signal return/earth leads, battery charger with 3 mains cables (UK, EUR and US), carry case, transit case and operating instructions	

Accessories

T23622790-1	Telescopic probe handle, 600 - 1200mm (24 - 47")
T23622790-2	Telescopic probe handle, 1800 - 3600mm (71 - 142")
T236139031	2m (6.5') earth signal return lead
T236139032	10m (32') earth signal return lead
T23615550	External battery pack

For a full range of rolling springs, rubber or wire brush probes and other accessories see pages 232 - 236

○ Calibration Certificate available. To order as a separate item, add prefix QC to the Part Number (e.g. QCD236--15KV is the certificate for model D236--15KV).

Elcometer 236, 266 & 280   Accessories for all High Voltage Holiday Detectors

Batteries, Chargers & Earth Signal Return Leads

Part Number	Description	Elcometer 236	Elcometer 266	Elcometer 280
T23615550	External rechargeable battery pack	■		
T23613907	Battery charger & mains lead (UK 240V)	■		
T23613908	Battery charger & mains lead (EU 220V)	■		
T23613909	Battery charger & mains lead (US 110V)	■		
T99923482	Rechargeable lithium ion battery pack		■	■
T99919999A	Battery charger & mains lead (UK 240V)		■	■
T99919999B	Battery charger & mains lead (EU 220V)		■	■
T99919999C	Battery charger & mains lead (US 110V)		■	■
T236139031	Earth signal return lead, 2m (6.5')	■		
T236139032	Earth signal return lead, 10m (32')	■		
T99916954	Earth signal return lead, 4m (13')		■	
T99916996	Earth signal return lead, 10m (32')		■	
T28022750	10m (32') earth lead, clip / Elcometer 280 connector			■
T28022622	Trailing signal return lead, 5m (16')			■

Telescopic Probes, Probe Extension Rods

Part Number	Description	Elcometer 236	Elcometer 266	Elcometer 280
T23622790-1	Telescopic probe handle, 0.6 - 1.20m (24 - 47")	□		
T23622790-2	Telescopic probe handle, 1.8 - 3.60m (71 - 142")	□		
T99919988-3	Probe extension piece, 250mm (9.8")	□	■	■
T99919988-1	Probe extension piece, 500mm (20")	□	■	■
T99919988-2	Probe extension piece, 1000mm (39")	□	■	■

Accessory Adaptors   Allowing other manufacturer's accessories to fit Elcometer models

Part Number	Description	Elcometer 236	Elcometer 266	Elcometer 280
T99920084	Adaptor for models: AP, APS, AP/S1, AP/S2, AP/W, 10/20, 14/20,10, 20 & 20S	□	■	■
T99920083	Adaptor for models: P20, P40, P60, 780, 785 & 790	□	■	■
T99920252	Adaptor for models: PHD 1-20 & PHD 2-40	□	■	■
T99922747	Adaptor for models: 4S, 4.0, 8.0, 35	□	■	■
T99920082	Adaptor for current range to fit old accessories	■	■	■
T99922768	Adaptor for Elcometer 136 and older 236 models	■		

□ Older Elcometer 236 models may require adaptor piece T99922768

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Accessories for all Elcometer High Voltage Holiday Detectors   Elcometer 236, 266 & 280

Wire Brush Probes, band brush, flat brush, internal and external pipe brush probes

	Part Number	Description			Compatible with		
					Elcometer 236	Elcometer 266	Elcometer 280
	T99919975	Band brush probe			□	■	■
	T99922751	Phosphor bronze brush probe			□	■	■
			Ancho				
	T99920022-1	Right angled wire brush probe	0.25m	9.8"	□	■	■
	T99920022-2	Right angled wire brush probe	0.50m	19.7"	□	■	■
	T99920022-3	Right angled wire brush probe	1.00m	39"	□	■	■
	T99926621	Spare wire brush electrode	0.25m	9.8"	□	■	■
	T99926622	Spare wire brush electrode	0.50m	19.7"	■	■	■
	T99926623	Spare wire brush electrode	1.00m	39"	■	■	■
			Diámetro				
	T99920071-1	Internal circular wire pipe brush probe	38mm	1.5"	□	■	■
	T99920071-2	Internal circular wire pipe brush probe	51mm	2.0"	□	■	■
	T99920071-3	Internal circular wire pipe brush probe	64mm	2.5"	□	■	■
	T99920071-4	Internal circular wire pipe brush probe	76mm	3.0"	□	■	■
	T99920071-5	Internal circular wire pipe brush probe	89mm	3.5"	□	■	■
	T99920071-6	Internal circular wire pipe brush probe	102mm	4.0"	□	■	■
	T99920071-7	Internal circular wire pipe brush probe	114mm	4.5"	□	■	■
	T99920071-8	Internal circular wire pipe brush probe	127mm	5.0"	□	■	■
	T99920071-9	Internal circular wire pipe brush probe	152mm	6.0"	□	■	■
	T99920071-10	Internal circular wire pipe brush probe	203mm	8.0"	□	■	■
	T99920071-11	Internal circular wire pipe brush probe	254mm	10"	□	■	■
	T99920071-12	Internal circular wire pipe brush probe	305mm	12"	□	■	■
	T9993766-	Spare circular wire brush electrode	38mm	1.5"	■	■	■
	T9993767-	Spare circular wire brush electrode	51mm	2.0"	■	■	■
	T9993768-	Spare circular wire brush electrode	64mm	2.5"	■	■	■
	T9993769-	Spare circular wire brush electrode	76mm	3.0"	■	■	■
	T9993770-	Spare circular wire brush electrode	89mm	3.5"	■	■	■
	T9993771-	Spare circular wire brush electrode	102mm	4.0"	■	■	■
	T9993772-	Spare circular wire brush electrode	114mm	4.5"	■	■	■
	T9993773-	Spare circular wire brush electrode	127mm	5.0"	■	■	■
	T9993774-	Spare circular wire brush electrode	152mm	6.0"	■	■	■
	T9993775-	Spare circular wire brush electrode	203mm	8.0"	■	■	■
	T9993776-	Spare circular wire brush electrode	254mm	10"	■	■	■
	T9993777-	Spare circular wire brush electrode	305mm	12"	■	■	■

□ Older Elcometer 236 models may require adaptor piece T99922768

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Elcometer 236, 266 & 280   Accessories for all High Voltage Holiday Detectors

Wire Brush Probes, band brush, flat brush, internal and external pipe brush probes

Part Number	Description			Compatible with		
				Elcometer 236	Elcometer 266	Elcometer 280
T99922752	'C-type' wire brush holder† (order C-type brush from the list below)			☐	■	■
T99922907	'C-type' wire brush support handle*			☐	■	■
		Outside Diameter (OD)				
		DN	NPS			
T99922745-1	External 'C-type' wire brush	150 - 250mm	6 - 9"	■	■	■
T99922745-2	External 'C-type' wire brush	250 - 350mm	9 - 12"	■	■	■
T99922745-3	External 'C-type' wire brush	350 - 450mm	12 - 16"	■	■	■
T99922745-4	External 'C-type' wire brush	450 - 550mm	16 - 20"	■	■	■
T99922745-5	External 'C-type' wire brush	550 - 650mm	20 - 24"	■	■	■
T99922745-6	External 'C-type' wire brush	650 - 750mm	24 - 28"	■	■	■
T99922745-7	External 'C-type' wire brush	750 - 850mm	28 - 32"	■	■	■
T99922745-8	External 'C-type' wire brush	850 - 950mm	32 - 36"	■	■	■
T99922745-9	External 'C-type' wire brush	950 - 1050mm	36 - 40"	■	■	■
T99922745-10	External 'C-type' wire brush	1050 - 1150mm	40 - 44"	■	■	■

† Wire brush holder supplied separately (T99922752)
* Wire brush support handle ideal for two handed use or second person for large diameters

Conductive Rubber Probes

Part Number	Description	Width		Elcometer 236	Elcometer 266	Elcometer 280
T99920022-11	Right angled rubber probe	250mm	9.8"	☐	■	■
T99920022-12	Right angled rubber probe	500mm	19.7"	☐	■	■
T99920022-13	Right angled rubber probe	1000mm	39"	☐	■	■
T99920022-14	Right angled rubber probe	1400mm	55"	☐	■	■
T99926731	Spare rubber electrode	250mm	9.8"	■	■	■
T99926732	Spare rubber electrode	500mm	19.7"	■	■	■
T99926733	Spare rubber electrode	1000mm	39"	■	■	■
T99926734	Spare rubber electrode	1400mm	55"	■	■	■

Rolling Springs Holders

Part Number	Description			Elcometer 236	Elcometer 266	Elcometer 280
T99920086	Phosphor bronze rolling spring holder Order the relevant phosphor bronze spring(s) from the list on pages 235 - 236			☐	■	■
T99922746	Stainless steel rolling spring holder Order the relevant stainless spring(s) from the list on pages 235 - 236			☐	■	■

☐ Older Elcometer 236 models may require adaptor piece T99922768

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Accessories for all Elcometer High Voltage Holiday Detectors

Elcometer 236, 266 & 280

Rolling Springs Available in phosphor bronze or stainless steel

Each spring is supplied with an easy-release coupling piece, allowing users to quickly connect and disconnect the rolling spring at stanchions, pillars, etc.

Please note that rolling springs are not supplied with a spring holder. Please order the appropriate rolling spring holder separately.

Rolling springs are available in 2 versions, phosphor bronze round spring and 304 stainless steel box section spring. The 19mm (0.75") diameter phosphor bronze springs are almost 3 times lighter than the 34mm (1.33") diameter stainless steel springs.

Rolling Spring Dimensions		Nominal Pipe Size		Pipe Outside Diameter (OD)			
Part Number		DN	NPS	millimeters (mm)		inches (")	
Phosphor Bronze	Stainless Steel	(mm)	(inches)	min OD	max OD	min OD	max OD
T99920438-15A	-	40	1.5	48	54	1.9	2.1
T99920438-15B	-			54	60	2.1	2.4
T99920438-20A	-	50	2.0	60	66	2.4	2.6
T99920438-20B	-			66	73	2.6	2.9
T99920438-25A	T99922744-25A	65	2.5	73	80	2.9	3.1
T99920438-25B	T99922744-25B			80	88	3.1	3.5
T99920438-30A	T99922744-30A	80	3.0	88	95	3.5	3.7
T99920438-30B	T99922744-30B			95	100	3.7	3.9
T99920438-35A	T99922744-35A	90	3.5	100	108	3.9	4.3
T99920438-35B	T99922744-35B			108	114	4.3	4.5
T99920438-40A	T99922744-40A	100	4.0	114	125	4.5	4.9
T99920438-45A	T99922744-45A	114	4.5	125	136	4.9	5.4
T99920438-45B	T99922744-45B			136	141	5.4	5.6
T99920438-50A	T99922744-50A	125	5.0	141	155	5.6	6.1
T99920438-50B	T99922744-50B			155	168	6.1	6.6
T99920438-60A	T99922744-60A	152	6.0	168	180	6.6	7.1
T99920438-60B	T99922744-60B			180	193	7.1	7.6
T99920438-70A	T99922744-70A	178	7.0	193	213	7.6	8.4
T99920438-70B	T99922744-70B			213	219	8.4	8.6
T99920438-80A	T99922744-80A	203	8.0	219	240	8.6	9.4
T99920438-90A	T99922744-90A	229	9.0	240	264	9.4	10.4
T99920438-100A	T99922744-100A	254	10.0	264	290	10.4	11.4
T99920438-110A	T99922744-110A	279	11.0	290	320	11.4	12.6
T99920438-120A	T99922744-120A	305	12.0	320	350	12.6	13.8
T99920438-140A	T99922744-140A	356	14.0	350	375	13.8	14.8
T99920438-140B	T99922744-140B			375	400	14.8	15.7

□ Older Elcometer 236 models may require adaptor piece T99922768

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Elcometer 236, 266 & 280 — Accessories for all High Voltage Holiday Detectors

Rolling Springs — Available in phosphor bronze or stainless steel

Rolling springs are available in 2 versions, phosphor bronze round spring and 304 stainless steel box section spring. The 19mm (0.75") diameter phosphor bronze springs are almost 3 times lighter than the 34mm (1.33") diameter stainless steel springs.

Rolling Spring Dimensions		Nominal Pipe Size		Pipe Outside Diameter (OD)			
Part Number		DN	NPS	millimeters (mm)		inches (")	
Phosphor Bronze	Stainless Steel	(mm)	(inches)	min OD	max OD	min OD	max OD
T99920438-160A	T99922744-160A	406	16.0	400	435	15.7	17.1
T99920438-160B	T99922744-160B			435	450	17.1	17.7
T99920438-180A	T99922744-180A	457	18.0	450	500	17.7	19.7
T99920438-200A	T99922744-200A	508	20.0	500	550	19.7	21.7
T99920438-220A	T99922744-220A	559	22.0	550	600	21.7	23.6
T99920438-240A	T99922744-240A	610	24.0	600	650	23.6	25.6
T99920438-260A	T99922744-260A	660	26.0	650	700	25.6	27.6
T99920438-280A	T99922744-280A	711	28.0	700	750	27.6	29.5
T99920438-300A	T99922744-300A	762	30.0	750	810	29.5	31.9
T99920438-320A	T99922744-320A	813	32.0	810	860	31.9	33.9
T99920438-340A	T99922744-340A	864	34.0	860	910	33.9	35.8
T99920438-360A	T99922744-360A	914	36.0	910	960	35.8	37.8
T99920438-380A	T99922744-380A	965	38.0	960	1010	37.8	39.8
T99920438-400A	T99922744-400A	1016	40.0	1010	1060	39.8	41.7
T99920438-420A	T99922744-420A	1067	42.0	1060	1110	41.7	43.7
T99920438-440A	T99922744-440A	1118	44.0	1110	1160	43.7	45.7
T99920438-460A	T99922744-460A	1168	46.0	1160	1210	45.7	47.6
T99920438-480A	T99922744-480A	1219	48.0	1210	1270	47.6	50.0
T99920438-500A	T99922744-500A	1270	50.0	1270	1320	50.0	52.0
T99920438-520A	T99922744-520A	1321	52.0	1320	1370	52.0	53.9
T99920438-540A	T99922744-540A	1372	54.0	1370	1425	53.9	56.1

Other sizes are available upon request. Please contact your nearest distributor for more information.

Grounding Mats

Grounding mats are ideal for testing on un-grounded pipes. The conductive rubber mat is wrapped around the coated pipe and connected to both the grounding pin (supplied separately) and the signal return lead.
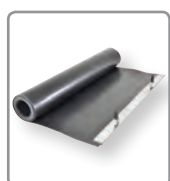
Part Number	Description	Outside Diameter (OD)		Compatible with		
		DN	NPS	Elcometer 236	Elcometer 266	Elcometer 280
T28022637-1	Grounding Mat	up to 229mm	up to 9"			■
T28022637-2	Grounding Mat	up to 457mm	up to 18"			■
T28022637-3	Grounding Mat	up to 762mm	up to 30"			■
T28022637-4	Grounding Mat	up to 1067mm	up to 42"			■
T28022748	Grounding pin; 60cm (23.5") long					■
T28022749	10m (32') earth lead, clips each end					■
T28022750	10m (32') earth lead, clip / Elcometer 280 connector					■

□ Older Elcometer 236 models may require adaptor piece T99922768

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UV Pinhole Flashlight

Elcometer 260

The Elcometer 260 UV Pinhole Flashlight is battery powered and housed in a rugged aluminium case providing a quick, low cost method of testing coatings for pinholes.

Featuring a single Watt purple light emitting diode, the Elcometer 260 UV flashlight has a beam wavelength of 405nm (±5nm), which the human eye perceives as a purple light.

A UV reflective additive is applied to the base coat. The UV flashlight shines the purple light on the coating, the base coat fluoresces where it is not covered by any subsequent coating - identifying any pinholes in the top coat.

STANDARDS:
ASTM E2501

Technical Specification

Part Number	D260----2
Beam Wavelength	405nm ±5nm
Flashlight Casing	Hard anodised aluminium
Battery Life	6 hours (continuous use)
Battery Type	2 x CR123A lithium batteries
Lens Type	Dual element diffuser
Weight	173g (6.1oz)
Dimensions	150 x 35mm (6 x 1.4")
Packing List	Elcometer 260 UV Pinhole Flashlight, UV protective glasses, nylon belt holster, 2 x 123A lithium batteries, operating instructions

Accessories

T26020140	UV Protective Glasses
T26020141	2 x Replacement Lithium 123A Batteries

elcometer®
inspection equipment

ELCOMETER 280
PULSED HOLIDAY DETECTOR

Making pulsed DC holiday detection safer, easier and more reliable

Rugged, shockproof and water resistant, the Elcometer range of DC, Pulsed DC, and Low Voltage Holiday Detectors are designed to meet the most exacting specifications. Ergonomic features and interchangeable probes make Elcometer's range the most versatile in the industry.

Pinhold Detection

The Elcometer 270 sets the standard for wet sponge detectors - high quality, low voltage detectors with a range of accessories to meet your requirements.

See page 222

DC Holiday Detection

The Elcometer 266 High Voltage DC holiday detector's menu allows access to every major International Standard and automatically sets the required parameters.

See page 228

Pulsed Holiday Detection

The new Elcometer 280 Pulsed DC holiday detector with three grounding options makes pipeline inspection faster and safer than ever before.

See page 224

Adaptors & Accessories

Elcometer offers a wide range of versatile accessories designed to meet every application and adaptors to work with your current brushes and probes.

See page 232

Inspector's Accessories

Elcometer offers a full range of inspection and visual comparison manuals specifically for the coatings inspector.

Elcometer also provides a range of Pictorial Surface Standards for blast cleaning incorporating standards for BS, ISO, SIS, and SSPC.

The publications are related to different aspects of the testing we offer. In general they offer reference information on paint testing methods and related inspection requirements.

The Macaw's Pipeline Defects is a text book specific to pipelines and contains information on pipeline coatings.

During inspection, sometimes the substrate or coating requires closer investigation. In dark or shaded areas such as in ballast tanks or on large production sites, further investigation may require additional light.

It may be necessary to take a detailed look at a specific area where you cannot get to. In this case an inspection mirror is required. For close up investigations, the inspector may require magnification of the surface for a clearer understanding.

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Elcometer 131

Inspection Mirrors

Ideal for inspecting difficult to access areas - inside pipes, behind corners, underneath inspection tanks, and other inaccessible or awkward areas.

Combined with the full range of test equipment from Elcometer, these high quality, robust mirrors help to provide a detailed examination of the component or project under inspection.

Technical Specification

Part Number	Description
H131---1A	Elcometer 131/1A Telescopic Inspection Mirror
H131---1B	Elcometer 131/1B Telescopic Inspection Mirror
H131---1C	Elcometer 131/1C Telescopic Inspection Mirror
H131---2A	Elcometer 131/2A Illuminated Inspection Mirror (Battery Type 2 x LR14 C)
Dimensions	Elcometer 131/1A - Extends from 520mm (20.5") to 1500mm (59") Mirror diameter: 63mm (2.5") Elcometer 131/1B - Extends from 165mm (6.5") to 925mm (36") Mirror diameter: 57mm (2.25") Elcometer 131/1C - Extends from 165mm (6.5") to 750mm (29.5") Mirror diameter: 82mm (3.25") Elcometer 131/2A - Mirror diameter: 63mm (2.5")
Packed Weight	Elcometer 131/1A - 650g (1.43lb) Elcometer 131/1B - 100g (0.22lb) Elcometer 131/1C - 100g (0.22lb) Elcometer 131/2A - 650g (1.43lb)
Packing List	Elcometer 131 Inspection Mirror and operating instructions

H131---1A

Telescopic Inspection Mirror

H131---1C

Telescopic Inspection Mirror
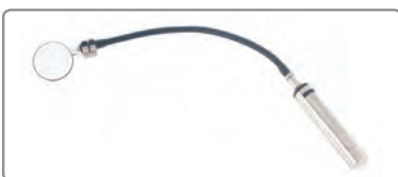
H131---2A

Illuminated Inspection Mirror

H131---1B

Telescopic Inspection Mirror

Illuminated (x10) Magnifier

From time to time a closer inspection of a surface is required to ascertain the exact conditions of the material's profile, cleanliness etc.

The Elcometer 137 illuminated magnifier is the ideal product for the job as many environments can be in low light or dark areas - ballast tanks, oil and gas tanks, etc.

- Lightweight, battery powered, portable magnifier
- Ideal for viewing surface comparators
- x10 magnification for close surface inspection
- Scaled lens for easy measurement of surface features

Technical Specification

Part Number	Description
H137----1	Elcometer 137 Illuminated Magnifier
Battery Type	3 x LR14 (C)
Dimensions	33 x 215mm (1.3 x 8.5")
Weight	236g (0.52lb)
Packing List	Elcometer 137 Illuminated Magnifier and operating instructions

Pocket (x30) Microscope

The Elcometer 7210 is pocket size making it an extremely practical microscope for site inspections.

Having x30 magnification and an inbuilt light source, the Elcometer 7210 Pocket Microscope is the ideal choice for close up investigation of defects and surface cleanliness.

Technical Specification

Part Number	Description
KT007210M001	Elcometer 7210 Pocket Microscope
Battery Type	1 x LR03 (AAA)
Dimensions	140 x 50 x 22mm (5.5 x 2 x 0.9")
Weight	68g (0.14lb)
Packing List	Elcometer 7210 Pocket Microscope and operating instructions

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Elcometer 900

Illuminated (x50) Microscope

The Elcometer 900 is a very simple, graduated x50 microscope with internal illumination.

This allows the user to quickly determine the width by counting the number of graduated reticules on the scaled lens and then calculating the value.

Technical Specification

Part Number	Description		
W90018568-D	Elcometer 900 Microscope		
Battery Type	1 x LR03 (AAA)		
Dimensions	120 x 43 x 115 mm (4.7 x 1.7 x 4.5")	Weight	145g (0.31lb)
Packing List	Elcometer 900 Illuminated Microscope and operating instructions		

Elcometer 132

Safety Torch / Flash Light

Many environments can have low light, dark areas or explosive gas present; ballast tanks, oil and gas tanks, etc. It is imperative for safety reasons to be able to inspect the coating adequately and to have sufficient light.

The Elcometer 132 Safety Torch/Flash Light is explosion proof and meets the ATEX directive as category 2 equipment.

It is approved to the latest EN Standards for electrical apparatus for potential explosive atmospheres. This allows for use in Group II applications zones 1 and 2, IIA and IIB gases, where T4 temperature class permits.

Technical Specification

Part Number	Description
H132---1A	Elcometer 132 Safety Torch/Flash Light
Battery Type	2 x LR20 (D)
Dimensions	200 x 60 mm (7.8 x 2.4")
Weight	150g (5.3oz) without batteries
Packing List	Elcometer 132 Safety Torch/Flash Light and operating instructions

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Elcometer Fitz's Atlas 2 of Coatings Defects

The Elcometer Fitz's Atlas 2 of Coating Defects (EFA) takes the reader through a comprehensive range of problems and discusses each in detail.

EFA provides the User with a greater understanding of the defect, the probable cause and possible solutions. With in excess of 180 colour photographs, the user can quickly gain an insight into the coatings industry and the possible pitfalls.

Sections:
- Welding Faults: welds, cracks, surface porosity, undercut
- Surface Conditions: surface preparation, oil contamination, skip weld
- Coatings Defects: a comprehensive list of possible defects including blistering, bloom, chalking, cracking, erosion, fish eyes, orange peel
- Microcopy: blisters, bubbles, delamination, pinholes, voids, weed fouling
- Marine Fouling: animal fouling, barnacles, molluscs, weed or algae fouling

Technical Specification

Part Number	Description
H99916043	Elcometer Fitz's Atlas 2 of Coating Defects
Dimensions	223 x 220 x 70mm (9 x 8.6 x 3")
Weight	0.45kg (1lb)

Elcometer Macaw's Pipeline Defects

The aim of this publication is to illustrate the range of defects that may be encountered in high pressure steel pipelines and pipeline coatings.

The manual gives advice on the probable cause and significance of the defects and comments on appropriate remedial actions.

The defects included in this book encompass all aspects of high pressure steel pipeline manufacture, construction and operation, together with sections on coating and cathodic protection defects and examples of how defects interact to generate new or modified risks to pipeline integrity.
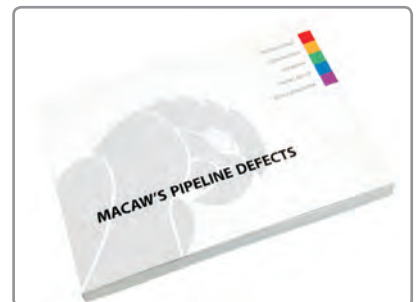
Technical Specification

Part Number	Description
H99918572	Elcometer Macaw's Pipeline Defects
Dimensions	210 x 148 x 15mm (8 x 6 x 0.5")
Weight	0.4kg (1.1lb)

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Elcometer 144 — Paint Safe Marker Pens

Paint Safe Marker Pens are used to highlight visual areas of non conformance, providing a clear indication of areas where rework or other processes need to be carried out.

The Safinah Marker pen has been specially selected for use as an inspection marker for all types of large steel fabrications which include both coated or uncoated ships and offshore structures.

The pen which is available in black, is ideal for testing application in the most sensitive areas.

Technical Specification

Part Number	Description
H144----1	Elcometer 144 Paint Safe Marker Pens (pack of 5)

Elcometer 147 — Weld Gauge

The Elcometer 147 Weld Gauge measures many aspects of welds in both metric and imperial units and includes:

- angle of preparation 0 to 60°
- misalignment (high - low)
- fillet weld throat size
- fillet weld length
- 2mm (0.79") edge roundness test
- excess weld metal (capping size)
- depth of undercut
- depth of pitting
- general linear measurements up to 60mm (2")

Technical Specification

Part Number	Description
H147----1	Elcometer 147 Weld Gauge
Angle of Preparation Scale	0 - 60° in 5° divisions
Misalignment Scale	0 - 25mm in 1mm divisions and 0 - 1" in 1/16" divisions
Fillet Leg & Excess Weld Scale	0 - 25mm in 1mm divisions and 0 - 1" in 1/16" divisions
Fillet Throat Scale	0 - 20mm in 1mm divisions and 0 - 3/4" in 1/16" divisions
Undercut Scale	0 - 4mm in 1mm divisions and 0 - 1/4" in 1/16" divisions
Dimensions	100 x 68mm (3.9 x 2.7")
Weight	154g (5.4oz)
Packing List	Elcometer 147 Weld Gauge and instruction card

Inspection Kits

Elcometer offers one of the widest ranges of inspection equipment available. Our products are used across numerous industry sectors. In all cases, there is always a need to undertake a number of specific inspections during quality control assessments - as one parameter can affect another.

One inspection parameter can affect another, for example the thickness of an applied coating can affect properties such as adhesion, gloss, colour and porosity.

Elcometer has put together a number of inspection kits which are both product and industry specific - combining those gauges from our range into one robust carry case, ideal for transporting to and from the inspection site.

Elcometer inspection kits are available for:

- Automotive Inspection
- Qualicoat & Powder Inspection
- Blasting Inspection
- Hazardous Area Inspection
- Protective Coating Inspection
- Surface Contamination
- Soluble Salt Inspection
- Heating, Ventilation & AC Duct Inspection
- Pinhole & Holiday Detection

Custom kits can also be developed for your particular requirements, please contact your distributor for further information.

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Elcometer Automotive

Automotive Inspection Kits

Produced specifically for the automotive aftermarket and Insurance Assessors, 3rd party consultants, body shops and used car sales, these kits provide an instant measure of the coating thickness of panels. An illuminated magnifier is supplied to enable close inspection of bodywork.

A digital thermometer is supplied with Kit 2, to verify, for example, panel temperatures when welding special steels.

Measurement parameters include:
- Surface temperature
- Surface inspection
- Coating thickness

STANDARDS:
AS/NZS 1580.108.1, ASTM B 499,
ASTM D 7091, ASTM E 376,
ISO 2360, ISO 2808-12,
ISO 2808-7C, ISO 2808-7D,
NF T30-124

Contents

Model	Description	Kit 1	Kit 2	Page
Elcometer 214L	Digital Thermometer		■	160
Elcometer 137	Illuminated Magnifier (x10)	■	■	241
Elcometer 415	Digital Coating Thickness Gauge	■	■	197

Individual Instruments can be used in accordance with many other tests.
Please see individual Product Information Pages for details.

Technical Specification

Part Number	Description
YKITAUTOMOTIVE-1	Elcometer Automotive Inspection Kit 1
YKITAUTOMOTIVE-2	Elcometer Automotive Inspection Kit 2
Dimensions	310 x 260 x 80mm (12.2 x 10.2 x 3.1")
Weight	Kit 1: 1kg (2.2lb) Kit 2: 1.5kg (3.3lb)

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Powder Coating Inspection Kit

Elcometer Powder

The Powder Coating Inspection Kit covers all eventualities in the powder inspection process, Elcometer has produced this kit to enable the inspection of powder coatings on all surfaces.

For a smooth surface, the digital Elcometer 415 may be used, but, for more demanding, uneven, surfaces, the Elcometer 1542 is included.

Measurement parameters include:
- Surface inspection
- Coating thickness
- Adhesion

STANDARDS:

AS 1580.408.4, AS/NZS 1580.108.1,
ASTM B 499, ASTM D 7091,
ASTM E 376, ISO 2360, ISO 2808-12,
ISO 2808-7C, ISO 2808-7D,
NF T30-124

Contents

Model	Description	Page
Elcometer 137	Illuminated Magnifier (x10)	241
Elcometer 415	Powder Coating Thickness Gauge	197
Elcometer 1542	Cross Hatch Cutter. 6 x 2mm or 6 x 1mm with ISO or ASTM Adhesive Tape	218

Individual Instruments can be used in accordance with many other tests.
Please see individual Product Information Pages for details.

Technical Specification

Part Number ISO Kit	ASTM Kit	Description
YKITPOWDER-1M	YKITPOWDER-1E	Elcometer Powder Coatings Inspection Kit
Dimensions		360 x 300 x 120mm (12.2 x 10.2 x 3.1")
Weight		580g (1.27lb)

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Elcometer Qualicoat

Powder Coating Inspection Kit

The Qualicoat Organisation brings together the ideals of several national coating associations into one quality label for the powder coating applied to aluminium architectural applications. The aim of Qualicoat is to establish the minimum standard that plant installations, coating materials and finished products which have been powder coated must meet.

Within this quality label, Qualicoat identifies a range of inspection requirements to be undertaken with regards to the quality control of powder coated products.

The Elcometer Qualicoat Powder Coating Inspection Kit provides the various test instrumentation required to meet the high standards of this organisation.

Measurement parameters include:

- Appearance
- Impact & deformation
- Hardness

- Oven temperature
- Coating thickness
- Adhesion

Contents

Model	Description	Basic	Top	Page
Elcometer 406L	Statistical Glossmeter: 60°	■		96
Elcometer 1506	Mandrel Bend Tester with 5mm and 8mm (0.20 and 0.31") Mandrels	■		83
Elcometer 1615	Base Unit and Tube Assembly	■		86
Elcometer 1615	Kit B: ISO 6272/2 and BS 6496	■		88
Elcometer 1620	Manual Cupping Tester with Digital Gauge	■		85
Elcometer 3095	Buchholz Hardness Tester	■		76
Elcometer 215	Oven Data Logger and Kit[+]	Standard	Top	164
Elcometer 415	FNF Integral Digital Coating Thickness Gauge for smooth surfaces	■		197
Elcometer 456	FNF Separate Digital Coating Thickness Gauge		Model T	188
Elcometer 456	Standard FNF 1 Probe, 0 - 1500µm		■	190
Elcometer 1542	Cross Cut Set 6 x 1, 2, 3mm with ISO and ASTM Adhesive Tape	■		218

Individual Instruments can be used in accordance with many other tests.
Please see individual Product Information Pages for details.
See pages 6 for the Elcometer Balance.

Technical Specification

Part Number Basic	Top	Description
YKITQUALICOAT-1B	YKITQUALICOAT-1T	Elcometer Qualicoat Powder Coatings Inspection Kit

[+] A wide range of k-type temperature probes is available. These are not supplied in the Qualicoat Kits and must be ordered separately.

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Blasting Inspection Kits

The Elcometer Blasting Inspection Kit is a surface preparation inspection kit providing a range of inspection equipment to test surface profile and surface contamination of blasted profiles.

An Elcometer 456 Gauge and probe can also be supplied. (Order separately if required.)

Measurement parameters include:
• Surface assessment
• Blast equipment inspection
• Surface profile
• Surface contamination

STANDARDS:
AS 3894.5, AS 3894.6-A, AS 3894.6-C, AS 3894.6-D, ASTM D 2200, ASTM D 4417-A, ASTM D 4417-B, ASTM D 4417-C, BS 7079-C5, IMO MSC.215(82), IMO MSC.244(83), ISO 8501-1, ISO 8502-3, ISO 8502-5, ISO 8502-6, ISO 8502-9, ISO 8503-1, ISO 8503-2, ISO 8503-5, NACE RP0287, SANS 5772, SS 55900, SSPC Guide 15, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000

Contents

Model	Description	Kit 1	Kit 2	Page
Elcometer 128	Pictorial Standards[1]			114
Elcometer 102	Needle Pressure Gauge	■	■	119
Elcometer 103	Blast Nozzle Gauge	■	■	119
Elcometer 125	Surface Comparator, Grit	■		130
Elcometer 125	Surface Comparator, Shot	■		130
Elcometer 122	Testex Tape, Coarse	■		129
Elcometer 122	Testex Tape, Extra Coarse	■		129
Elcometer 124	Testex Dial Thickness Gauge	■		129
Elcometer 224	Surface Profile Separate Gauge, Model Top		■	120
Elcometer 142	Dust Tape Test Kit		■	145
Elcometer 134	Chlor*Test Surface Testing Kit	■	■	141
Elcometer 134	Chlor*Test Abrasive Testing Kit	■	■	116
Elcometer 134	Chlor*Test Water Testing Kit	■	■	117
Elcometer 138	Bresle Salt Kit		■	136
Elcometer 138/2	Surface Contamination Kit		■	142

[1] Swedish Rust Standard ISO 8501, SIS055900 supplied in Metric Kit
US Standard SSPC VIS 1-01 and VIS-3 supplied in Imperial Kit

Technical Specification

Part Number Metric	Imperial	Description
YKIT-BLAST-1M	YKIT-BLAST-1E	Elcometer Blasting Inspection Kit 1
YKIT-BLAST-2M	YKIT-BLAST-2E	Elcometer Blasting Inspection Kit 2
Dimensions	Kit 1	495 x 420 x 175mm (19.49 x 16.54 x 6.89")
	Kit 2	575 x 475 x 205mm (22.64 x 18.70 x 8.07")

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Elcometer Hazard

Protective Inspection Kit for Hazardous Areas

The Elcometer Hazardous Area Inspection Kit is a protective coating inspection kit suitable for use in hazardous areas where electronic equipment is prohibited.

The kit provides all the tools required for the on-site inspection of a coating, including surface profile, dewpoint, relative humidity, both wet and dry film thickness and also adhesive testing.

Measurement parameters include:

- Surface inspection
- Surface profile
- Surface contamination

- Climatic conditions
- Coating thickness
- Adhesion

STANDARDS:

AS 1580.408.4, AS 2331.1.3, AS 3894.3-A, AS 3894.5, AS 3894.9, AS/NZS 1580.107.3, AS/NZS 1580.108.1, ASTM B 499, ASTM D 2200, ASTM D 3359-B, ASTM D 4414-A, ASTM D 4417-A, ASTM D 4417-C, ASTM G 12, BS 3900-C5-6A, BS 3900-C5-7B, BS 3900-E6, BS 5411-11, BS 7079-C5, DIN 50981, ECCA T6, EN 13523-6, IMO MSC.215(82), IMO MSC.244(83), ISO 16276-2, ISO 2178, ISO 2409, ISO 2808-1A, ISO 2808-6A, ISO 2808-7A, ISO 2808-7B, ISO 8501-1, ISO 8503-1, ISO 8502-5, ISO 8503-2, ISO 8503-5, JIS K 5600-1-7, JIS K 5600-5-6, NACE RP0287, NF T30-038, NF T 30-124, NF T30-125, SS 55900, SSPC Guide 15, SSPC-PA2, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000

Contents

Technical Specification

Part Number Metric	Imperial	Description
YKIT-HAZARD-1M	YKIT-HAZARD-1E	Elcometer Hazardous Area Inspection Kit
Dimensions		495 x 420 x 175mm (19.49 x 16.54 x 6.89")

[1]Swedish Rust Standard ISO 8501, SIS055900 supplied in Metric Kit, US Standard SSPC VIS 1-01 and VIS-3 supplied in Imperial Kit

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Digital Inspection Kits

These digital inspection kits have been specifically designed to undertake the three principal inspection requirements in the Protective and Industrial Coatings Industry – climate, surface profile and dry film thickness. Ideal for 'paperless' quality assurance systems the kits come complete with ElcoMaster™ 2.0 Data Management Software for professional reporting and analysis.

Two inspection kits are available (Standard & Top) to meet your specific needs.

Measurement parameters include:
• Surface profile
• Climatic conditions
• Coating thickness

supplied with
ElcoMaster™2.0
data management software
see page 264

compatible with
ElcoMaster™
mobile app
see page 266

available with
Bluetooth®
wireless technology
see page xyz

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 4417-B, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6B, BS 3900-C5-6A, BS 5411-11, BS 5411-3, BS 5599, DIN 50981, BS 7079-B4, DIN 50984, ECCA T1, EN 13523-1, IMO MSC.215(82), IMO MSC.244 (83), ISO 1461, ISO 19840, ISO 2063, ISO 2360, ISO 2808-6A, ISO 2808-6B, ISO 2808-7C, ISO 2808-7D, ISO 2808-12, ISO 8502-4, JIS K 5600-1-7, NF T30-124, SANS 5772, SS 184159, SSPC PA 2, US Navy PPI 63101-000, US Navy NSI 009-32

Contents

Model	Description	Standard	Top	Page
Elcometer 224	Integral Digital Surface Profile Gauge	Model B	Model T	120
Elcometer 319	Digital Dewpoint Meter	Standard	Top	150
Elcometer 319	External Magnetic Surface Probe		■	154
Elcometer 456	Ferrous Separate Coating Thickness Gauge	Model B	Model T	182
Elcometer 456	Ferrous Standard Separate Probe: Scale 1	■	■	189
Elcometer 456	Ferrous PINIP Probe: Scale 1	■	■	189
ElcoMaster™ 2.0	Data Management Software and USB Cable		■	264

Technical Specification

Part Number	Description
YKIT-DIGITAL-B	Elcometer Standard Digital Inspection Kit
YKIT-DIGITAL-T	Elcometer Top Digital Inspection Kit

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Elcometer Protective

Protective Inspection Kits 1, 2 & 3

The Elcometer Protective Coatings Inspection Kits 1, 2 & 3 provide the tools required for the on-site inspection of a coating, including surface profile, dewpoint, relative humidity, both wet and dry film thickness and also adhesive testing.

Available as metric or imperial kits and housed in a sturdy, light-weight carry case, Elcometer Protective Coatings Inspection Kits are invaluable to the operator in the field to ensure the coating is, or has been, applied correctly.

Protective Inspection Kit 1
An entry level inspection kit containing profile, climate, wet and dry film thickness. The Elcometer 456 coating thickness gauge connects via Bluetooth® to ElcoMaster™ 2.0 Data Management Software for paperless quality assurance.

Protective Inspection Kit 2
Like the Protective Inspection Kit 1 but with the addition of the Elcometer 224 digital surface profile gauge with data collection functionality and the Elcometer 319 digital dewpoint meter. Reports via ElcoMaster™ 2.0 can include data from both profile and climate inspections as well as dry film thickness.

Protective Inspection Kit 3
A comprehensive digital inspection kit providing gauges with data collection functionality for profile, climatic conditions and dry film thickness.

It comes complete with ElcoMaster™ 2.0 data management software with Bluetooth® communication to PC and Android™ Mobile Apps for instant data analysis and reporting for paperless quality assurance.

Measurement parameters include:
- Surface profile
- Surface temperature
- Climatic conditions
- Coating thickness
- Adhesion

STANDARDS:

AS 1580.408.4, AS 2331.1.4, AS 3894.3-B, AS 3894.9, AS/NZS 1580.107.3, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 3359-B, ASTM D 4414-A, ASTM D 4417-B, ASTM D 4417-C, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6B, BS 3900-C5-6A, BS 3900-C5-7B, BS 3900-E6, BS 7079-C5, BS 5411-11, BS 5411-3, BS 5599, BS 7079-B4, DIN 50981, DIN 50984, ECCA T1, ECCA T6, EN 13523-1, EN 13523-6, IMO MSC.215(82), IMO MSC.244(83), ISO 1461, ISO 16276-2, ISO 19840, ISO 2063, ISO 2360, ISO 2409, ISO 2808-1A, ISO 2808-6A, ISO 2808-6B, ISO 2808-7B, ISO 2808-7C, ISO 2808-7D, ISO 2808-12, ISO 8502-4, ISO 8503-5, JIS K 5600-1-7, JIS K 5600-5-6, NACE RP0287, NF T30-038, NF T30-124, NF T30-125, SANS 5772, SS 184159, SSPC PA 2, US Navy NSI 009-32, US Navy PPI 63101-000

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Protective Inspection Kits 1, 2 & 3

Elcometer Protective

Contents

Model	Description	Kit 1	Kit 2 Standard	Kit 2 Top	Kit 3 Standard	Kit 3 Top	Page
Elcometer 122	Testex Tape, Coarse & Extra Course	■	■	■			129
Elcometer 124	Thickness Gauge	■	■	■			129
Elcometer 224	Digital Surface Profile Gauge		Model B Integral	Model T Separate	Model B Integral	Model T Separate	120
Elcometer 224	Standard Separate Probe			■		■	125
Elcometer 212	Digital Thermometer °C (°F) with Surface Probe	■					158
Elcometer 116	Whirling Hygrometer °C (Metric), Sling Hygrometer °F (Imperial)	■					156
Elcometer 114	Dewpoint Calculator	■					156
Elcometer 319	Digital Dewpoint Meter		Standard	Top	Standard	Top	150
Elcometer 112	Hexagonal Wet Film Comb 25 - 3000µm (0 - 120mils)	■	■	■			172
Elcometer 115	Wet Film Comb				■	■	173
Elcometer 456	Integral Digital Coating Thickness Gauge	Ferrous Model S					182
Elcometer 456	Separate Digital Coating Thickness Gauge		Ferrous Model S	Ferrous Model S	Dual FNF Model T	Dual FNF Model T	182
Elcometer 456	Standard Separate Probe		■	■	■	■	189
Elcometer 107	Cross Hatch Full Kit[1]	■					217
Elcometer 107	Cross Hatch Cutter[2]		■	■	■	■	217
Elcometer 107	ISO or ASTM Adhesive Tape, 1 roll		■	■	■	■	217

[1] ISO (ASTM) Tape, Brush & Eye Glass

[2] 6 x 2mm (Metric Kit) 6 x 1mm (Imperial Kit)

Technical Specification

Part Number Metric	Imperial	Description
YKIT-PROTECTIVE-1M	YKIT-PROTECTIVE-1E	Elcometer Protective Inspection Kit 1
YKITPROTECTIVE-2SM	YKITPROTECTIVE-2SE	Elcometer Protective Inspection Kit 2 Standard
YKITPROTECTIVE-2TM	YKITPROTECTIVE-2TE	Elcometer Protective Inspection Kit 2 Top
YKITPROTECTIVE-3SM	YKITPROTECTIVE-3SE	Elcometer Protective Inspection Kit 3 Standard
YKITPROTECTIVE-3TM	YKITPROTECTIVE-3TE	Elcometer Protective Inspection Kit 3 Top
Dimensions	Kit 1 Kit 2 Kit 3	456 x 384 x 110mm (17.95 x 15.12 x 4.33") 456 x 384 x 127mm (17.95 x 15.12 x 5.00") 456 x 384 x 127mm (17.95 x 15.12 x 5.00")

If the kit that you require is not listed above, Elcometer will be happy to discuss your requirements and create one to suit your particular needs. Alternative Elcometer 456 Coating Thickness gauges or scale ranges can be substituted in any kit upon request.

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Elcometer Protective

Protective Coating Inspection Kit 4

The Elcometer Protective Coatings Inspection Kit 4 provides a range of test equipment to help an inspector assess a substrate prior to the application of a coating.

Measurement parameters include:
- Surface inspection
- Weld inspection
- Surface cleanliness
- Climatic conditions
- Surface profile
- Coating thickness

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS 3894.6-A, AS 3894.6-C, AS 3894.9, AS/NZS 1580.107.3, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 2200, ASTM D 4414-A, ASTM D 4417-C, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6A, BS 3900-C5-6B, BS 5411-11, BS 5411-3, BS 5599, BS 7079-B4, BS 7079-C5, DIN 50981, DIN 50984, ECCA T1, EN 13523-1, IMO MSC.215(82), IMO MSC.244(83), ISO 1461, ISO 19840, ISO 2063, ISO 2360, ISO 2808-12, ISO 2808-1A, ISO 2808-6A, ISO 2808-6B, ISO 2808-7B, ISO 2808-7C, ISO 2808-7D, ISO 8501-1, ISO 8502-3, ISO 8502-4, ISO 8502-6, ISO 8502-9, ISO 8503-5, JIS K 5600-1-7, NACE RP0287, NF T30-124, NF T30-125, SANS 5772, SS 184159, SS 55900, SSPC Guide 15, SSPC PA 2, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000

Contents

Model	Description	Kit 4	Page
Elcometer 128	Pictorial Standard[1]	■	114
Elcometer 131	Telescopic Inspection Mirror	■	240
Elcometer 144	Paint Safe Marker Pens (Pack of 3)	■	244
Elcometer 147	Weld Gauge	■	244
Elcometer 142	Dust Tape Test Kit	■	145
Elcometer 138	Bresle Salt Kit	■	136
Elcometer 319	Digital Dewpoint Meter	Top	150
Elcometer 224	Integral Digital Surface Profile Integral Gauge	Model T	120
Elcometer 112	Hexagonal Wet Film Comb: 25 - 3000µm (1 - 120mils)	■	172
Elcometer 456	Separate Digital Coating Thickness Gauge[c] with F2 Standard Probe	Ferrous Model T	182

Technical Specification

Part Number Metric	Imperial	Description
YKIT-PROTECTIVE-4M	YKIT-PROTECTIVE-4E	Elcometer Protective Coatings Kit 4
Dimensions		495 x 420 x 175mm (19.49 x 16.54 x 6.89")

Protective Inspection Kit 5

A more comprehensive kit than kits 1-4, the Elcometer Protective Coatings Inspection Kit 5 expands the range of instruments available to the protective coatings inspector.

Measurement parameters include:

- Material thickness
- Surface inspection
- Weld inspection
- Surface cleanliness

- Surface profile
- Climatic conditions
- Coating thickness
- Adhesion

STANDARDS:

AS 1580.108.2, AS 1580.408.4, AS 2331.1.4, AS 3894.3-B, AS 3894.6-A, AS 3894.6-C, AS 3894.6-D, AS 3894.9, AS/NZS 1580.107.3, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 2200, ASTM D 3359-B, ASTM D 4138-A, ASTM D 4414-A, ASTM D 4417-C, ASTM D 7091, ASTM E 376, ASTM E 797, ASTM G 12, BS 3900-C5-5B, BS 3900-C5-6A, BS 3900-C5-6B, BS 3900-E6, BS 5411-11, BS 5411-3, BS 5599, BS 7079-B4, BS 7079-C5, DIN 50981, DIN 50984, DIN 50986, ECCA T1, ECCA T6, EN 13523-1, EN 13523-6, EN 15317, IMO MSC.215(82), IMO MSC.244(83), ISO 1461, ISO 16276-2, ISO 19840, ISO 2063, ISO 2360, ISO 2409, ISO 2808-12, ISO 2808-1A, ISO 2808-5B, ISO 2808-6A, ISO 2808-6B, ISO 2808-7B, ISO 2808-7C, ISO 2808-7D, ISO 8501-1, ISO 8502-3, ISO 8502-4, ISO 8502-6, ISO 8502-9, ISO 8503-5, JIS K 5600-1-7, NACE RP0287, NF T30-038, NF T30-123, NF T30-124, NF T30-125, SANS 5772, SS 184159, SS 55900, SSPC Guide 15, SSPC PA 2, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000

Contents

Model	Description	Kit 5	Page
Elcometer 204	Steel Ultrasonic Thickness Gauge	■	106
Elcometer 128	Pictorial Standards[1]	■	114
Elcometer 131	Telescopic Inspection Mirror	■	240
Elcometer 137	Illuminated Magnifier	■	241
Elcometer 144	Paint Safe Marker Pens (Pack of 3)	■	244
Elcometer 147	Weld Gauge	■	244
Elcometer 142	Dust Tape Test Kit	■	145
Elcometer 138	Bresle Salt Kit	■	136
Elcometer 138/2	Surface Contamination Kit	■	142
Elcometer 122	Testex Tape, Coarse & Extra Course	■	129
Elcometer 124	Thickness Gauge	■	129
Elcometer 224	Digital Surface Profile Separate Gauge & Standard Separate Probe	Model T	120
Elcometer 319	Digital Dewpoint Meter, with Magnetic Surface Probe	Top	150
Elcometer 112	Hexagonal Wet Film Comb: 25 - 3000µm (1 - 120mils)	■	172
Elcometer 456	Separate Digital Coating Thickness Gauge[c] with F2 Standard Probe	Ferrous Model T	182
Elcometer 121	Paint Inspection Gauge with Cross Hatch Cutters 6 x 1, 2 & 3mm and ISO (ASTM) Adhesive Tape	Top	204

Technical Specification

Part Number		Description
Metric	Imperial	
YKIT-PROTECTIVE-5M	YKIT-PROTECTIVE-5E	Elcometer Protective Coatings Inspection Kit 5
Dimensions		575 x 475 x 205mm (22.64 x 18.70 x 8.07")

[1]Swedish Rust Standard ISO 8501, SIS055900 supplied in Metric Kit, US Standard SSPC VIS 1-01 and VIS-3 supplied in Imperial Kit

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Elcometer Protective

Protective Coating Inspection Kit 6

The Elcometer Protective Coatings Inspection Kit 6 is a comprehensive kit which incorporates all the key gauges and inspection accessories required to assess a structure before, during and after coating has been applied.

Measurement parameters include:

- Material thickness
- Surface inspection
- Weld inspection
- Surface cleanliness
- Surface profile

- Climatic conditions
- Coating thickness
- Adhesion
- Pinhole detection

STANDARDS:

AS 1580.108.2, AS 1580.408.4, AS 2331.1.4, AS 3894.2, AS 3894.3-B, AS 3894.6-A, AS 3894.6-C, AS 3894.6-D, AS 3894.9, AS/NZS 1580.107.3, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 2200, ASTM D 3359-B, ASTM D 4138-A, ASTM D 4414-A, ASTM D 4417-C, ASTM D 5162-A, ASTM D 7091, ASTM E 376, ASTM E 797, ASTM G 12, ASTM G6, ASTM G62-A, BS 3900-C5-5B, BS 3900-C5-6A, BS 3900-C5-6B, BS 3900-E6, BS 5411-11, BS 5411-3, BS 5599, BS 7079-B4, BS 7079-C5, BS 7793-2, DIN 50981, DIN 50984, DIN 50986, ECCA T1, ECCA T6, EN 13523-1, EN 13523-6, EN 15317, IMO MSC.215(82), IMO MSC.244(83), ISO 1461, ISO 14654, ISO 16276-2, ISO 19840, ISO 2063, ISO 2360, ISO 2409, ISO 2808-12, ISO 2808-1A, ISO 2808-5B, ISO 2808-6A, ISO 2808-6B, ISO 2808-7B, ISO 2808-7C, ISO 2808-7D, ISO 8289-A, ISO 8501-1, ISO 8502-3, ISO 8502-4, ISO 8502-6, ISO 8502-9, ISO 8503-5, JIS K 5600-1-7, JIS K 6766, NACE RP 0188, NACE RP0287, NACE SP 0188, NACE TM0384, NF T30-038, NF T30-123, NF T30-124, NF T30-125, SANS 5772, SS 184159, SS 55900, SSPC Guide 15, SSPC PA 2, SSPC VIS 1, SSPC VIS 2, SSPC VIS 3, SSPC VIS 4, SSPC VIS 5, US Navy NSI 009-32, US Navy PPI 63101-000

Contents

Model	Description	Kit 6	Page
Elcometer 204	Steel Ultrasonic Thickness Gauge	▪	106
Elcometer 128	Pictorial Standards[1]	▪	114
Elcometer 131	Telescopic Inspection Mirror	▪	240
Elcometer 137	Illuminated Magnifier	▪	241
Elcometer 144	Paint Safe Marker Pens (Pack of 3)	▪	244
Elcometer 147	Weld Gauge	▪	244
Elcometer 142	Dust Tape Test Kit	▪	145
Elcometer 138	Bresle Salt Kit	▪	136
Elcometer 138/2	Surface Contamination Kit	▪	142
Elcometer 122	Testex Tape, Coarse & Extra Course	▪	129
Elcometer 124	Thickness Gauge	▪	129
Elcometer 224	Digital Surface Profile Separate Gauge & Standard Separate Probe	Model T	120
Elcometer 319	Digital Dewpoint Meter, with Magnetic Surface Probe	Top	150
Elcometer 112	Hexagonal Wet Film Comb: 25 - 3000µm (1 - 120mils)	▪	172
Elcometer 456	Separate Digital Coating Thickness Gauge[c] with F2 Standard Probe	Ferrous Model T	183
Elcometer 121	Paint Inspection Gauge (Top) with Cross Hatch Cutters 6 x 1, 2 & 3mm & ISO (ASTM) Adhesive Tape	Top	204
Elcometer 270	Pinhole Detector (9 , 67.5 & 90V)	▪	222

Technical Specification

Part Number		Description
Metric	Imperial	
YKIT-PROTECTIVE-6M	YKIT-PROTECTIVE-6E	Elcometer Protective Coatings Kit 6
Dimensions	575 x 475 x 205mm (22.64 x 18.70 x 8.07")	

[1]Swedish Rust Standard ISO 8501, SIS055900 supplied in Metric Kit, US Standard SSPC VIS 1-01 and VIS-3 supplied in Imperial Kit

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Surface Contamination Kit

The Elcometer 138/2 Surface Contamination Kit provides the means for testing invisible surface contaminants and includes tests for:

- pH
- chloride ions
- iron
- soluble salts

STANDARDS:
AS 3894.6-A, AS 3894.6-D, SSPC Guide 15

Contents

Model	Description
E135----A	Bresle Sampler (Box of 50)
T13818517	3 x 5ml (0.1fl oz) Syringes
T13818518	3 x Needles
T13818519	Plastic Beaker, 30ml (1fl oz)
T99911344	Pure Water, 250ml (8.5fl oz)
T13820562	100 x pH Test Strips
T13820563	100 x Iron Test Strips
T13820564	40 x Chloride Test Strips

Technical Specification

Part Number	Description
E138----2	Elcometer 138/2 Surface Contamination Kit
Measurement Range	pH: 0pH to 14pH Iron: 3 - 10 - 25 - 50 - 100 - 250 - 500mg/l Fe² Chloride: 30µg/cm² (30ppm) Cl to 600µg/cm² (600ppm) Cl
Dimensions	300 x 220 x 75mm (11 x 8.6 x 3")
Weight	2.1kg (4.62lb)
Packing List	100 x pH test strips, 100 x Iron test strips, 40 x Chloride test strips, 50 x Bresle samplers, 3 x 5ml (0.2fl oz) syringes, 3 x needles, 30ml (1fl oz) plastic beaker, carry case and operating instructions

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Elcometer 138

Bresle Salt Kit

It is essential that the level of contaminants on a surface is measured prior to application of the coating to ensure the quality of the coating and that its optimum lifetime is achieved.

If the coating is applied to a contaminated surface, which is not properly prepared, it could fail prematurely resulting in costly re-coating and high maintenance costs. The Elcometer 138 Bresle Kit includes the Elcometer 138 Conductivity Meter which accurately determines the level of soluble salts on a substrate.

STANDARDS:
AS 3894.6-A, IMO MSC.215(82),
IMO MSC.244(83), ISO 8502-6,
ISO 8502-9, SSPC Guide 15,
US Navy NSI 009-32,
US Navy PPI 63101-000

Contents

Model	Description
T13818515	Elcometer 138 Conductivity Meter
E135----B	Bresle Patches (Box of 25)
T13818517	3 x 5ml (0.1fl oz) Syringes
T13818518	3 x Needles
T13818519	Plastic Beaker 30ml (1fl oz)
T13818516	4 x Calibration Standards Solution
T99911344	Pure Water 250ml (8.5fl oz)

Technical Specification

Part Number	Description
E138----1	Elcometer 138 Bresle Salt Kit
Tests per Kit	25
Dimensions	300 x 220 x 75mm (11 x 8.6 x 3")
Weight	2.1kg (4.62lb)
Measuring Range	2% full scale ±1 digit. At a depth of more than 10mS/cm, the range is 3% full scale ±1 digit
Packing List	Box of 25 x Elcometer Bresle patches, 250ml pure water in clear plastic bottle, 3 x 5ml (0.1fl oz), syringes, 3 x blunt needles, 30ml (1fl oz) plastic beaker, Elcometer 138 Conductivity Meter, 2 x CR2032 lithium batteries, 2 x standard solution (1.41 mS/cm), moistening solution, purified water, pipette, conductivity meter storage pouch, carry case and operating instructions

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CSN Chloride, Sulphate & Nitrate Kit

Designed to accurately, measure surface chloride, sulphate and nitrate ions in minutes, the Elcometer 134 CSN Salt kit offers a single kit solution for testing in the field.

All the components of the Elcometer CSN Test Kits are pre-measured and pre-dosed for trouble free testing.

Results are recorded in parts per million (ppm) requiring no complicated calculations. Elcometer 134 CSN tests are all designed to use a ratio of 1:1 for easy conversation to µg/cm².

Supplied in an ABS plastic carry case for easy portability around the site, each field kit is supplied with full instructions attached to the inside lid, together with:
• 5 x Chloride tests
• 5 x Sulphate tests, together with 1 x colorimeter, for sulphate testing
• 5 x Nitrate test strips
• 5 x Syringes (without needles)

STANDARDS:

ISO 8502-5, ISO 8502-11, SSP Guide 15

Technical Specification

Part Number	Description
E134-CSN	Elcometer 134 CSN Chloride, Sulphate & Nitrate Test Kit
Measuring Range	0 - 100µg/cm² (0 - 100ppm)
Scale Resolution	1µg/cm² (1ppm)
Sample Time	1 - 5 minutes (approximately)
Storage Temperature	Not exceeding 25°C (77°F)
Dimensions	360 x 320 x 140mm (14.2 x 12.6 x 5.5")
Weight	1.76kg (3.8lb)
Packing List	5 x tests (containing: 5 x chloride tests, 5 x nitrate test strips, 5 x sulphate tests, 5 x syringes) 1 x colorimeter, carry case and operating instructions

Accessories

Part Number	Description
T134---C	1 set of 5 Nitrate Tests
T134-KIT	Refill Kit for Elcometer 134 CSN

Elcometer 270

Pinhole Detection Inspection Kit

The Elcometer 270 Pinhole Detectors Inspection Kit utilises the wet sponge technique and has been designed to set a new standard for wet sponge detectors - a high quality, low voltage detector with similar accessories to a high voltage spark tester.

The Inspector's Kit does not include the main instrument; just add the model number to the order:

Model	Description
D270----3	Elcometer 270/3 Pinhole Detector (9V & 90V)
D270----4	Elcometer 270/3 Pinhole Detector (9V, 67.5V & 90V)

For more information see pages 222-223.

STANDARDS:
AS 3894.2, ASTM D 5162-A, ASTM G6, ASTM G62-A, BS 7793-2, ISO 8289-A, ISO 14654, JIS K 6766, NACE RP 0188, NACE SP 0188, NACE TM0384

Technical Specification

Model	Description
T27018191	Elcometer 270 Inspection Kit
Packing List	separate wand handle & lead, roller wand, 10m (32') signal return cable, extension pieces, telescopic extension, belt clip, bottle of wetting agent, AA batteries, spare flat sponge, spare roller sponge

The kit does not include the main instrument; see page 222 for more information

Accessories

Standard wand — T27016867
A universal flat sponge to suit almost all applications

Spare flat sponge set — T27018050
Pack of 3 sponges;
150 x 60 x 25mm (6 x 2.3 x 1")

Roller sponge wand — T27016960
Ideal for large flat surface inspection

Spare roller sponge — T27018051

Separate wand adaptor — T27016999
with belt clip - converts the gauge into a separate pinhole detector

Telescopic wand adaptor — T27016998
with belt clip - extends to 1m(39"), ideal for floors or high areas

Extension piece — T27016965
420mm (16.5") extensions to expand operators reach
Additional extension pieces can be connected to each other

Wetting agent — T27018024
50ml (1.7floz) bottle - helps aid the fast detection of pinholes. Simply add to the water used to dampen the sponge

Return cable - 4m (13') — T99916954
supplied as standard, complete with crocodile clip and plug

Return cable - 10m (32') — T99916996
supplied on a drum, complete with clip and connection plug

elcometer®

Pulsed DC Holiday Detector Inspection Kit

Elcometer 280

The Elcometer 280 is a 'stick type' holiday detector which has been designed to make pulsed DC high voltage holiday detection safer, easier and more reliable than ever before.

Using state of the art electronics, the Elcometer 280 allows users to inspect coatings - without connecting the earth return lead to the component substrate - ideal for inspecting large surfaces and pipelines.

The Elcometer 280 uses the high voltage pulsed DC technique to detect holidays in coatings - even if the coating is damp, dirty or slightly conductive.

From the two stage safety switch, bright LED's and screen icons signifying when the high voltage is on, to the extended ribbing to protect the user from spark creep, the Elcometer 280 sets the standard for high voltage measurement safety.

STANDARDS:

AS 3894.1, ANSI/AWWA C203, ANSI/AWWA C214, ASTM D4787, ASTM D5162, ISO 29601, JIS G 3491, JIS G 3492, NACE RP0274, NACE SP0188, NACE SP0490, NACE TM0186, NACE TM0384

Technical Specification

Part Number	Description
D280-T-KIT	Elcometer 280 Pulsed DC Holiday Detector Inspection Kit
Packing List	Elcometer 280 Pulsed DC Holiday Detector Gauge (Model T), 5m (16') trailing signal return lead, battery pack (2 supplied with Model T), battery charger with mains cables (UK, EUR & US), stainless steel rolling spring holder (supplied with Model T only), 250mm (9.8") probe extension shaft, shoulder strap and operating instructions - packed in a light weight, rugged, wheeled transit case

Accessories – For more information see pages 233-236

Band brush probe

Phosphor bronze brush probes

External 'C-type' wire brushes

Right angled wire brush probes

Spare wire brush probes

Right angled rubber probes

Internal circular wire pipe brush probes
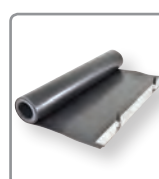
Grounding Mat

elcometer®

Elcometer DUCT

Duct Deposit Measuring System

Controlling ducting deposits and monitoring their build-up is essential to maintain hygiene standards and reduce fire risks in heating and ventilation systems.

The Elcometer 456 Duct Deposit Measuring System has been specifically designed to meet the requirements of the DTT (Deposit Thickness Test) in HVCA's (Heating & Ventilation Contractor's Association) Guide to Good Practice, for the measurement of dust and grease deposits within ventilation systems and kitchen ducts made of ferrous metals.

By using the Elcometer 456 Ferrous Top Gauge with the specially designed probe and duct cleaning templates, readings can be taken of the deposit thickness on a specific test area, before and after cleaning.

ElcoMaster™ 2.0 software, supplied as standard with the Elcometer 456 Duct Deposit Measuring System includes a template designed specifically for reporting duct deposit measurements.

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186-B, ASTM D 1400, ASTM D 7091, ASTM E 376, ASTM G 12, BS 3900-C5-6B, BS 3900-C5-6A, BS 5411-11, BS 5411-3, BS 5599, DIN 50981, DIN 50984, ECCA T1, EN 13523-1, IMO MSC.215(82), IMO MSC.244 (83), ISO 1461, ISO 19840, ISO 2063, ISO 2360, ISO 2808-6A, ISO 2808-6B, ISO 2808-7C, ISO 2808-7D, ISO 2808-12, JIS K 5600-1-7, NF T30-124, SS 184159, SSPC PA 2, US Navy PPI 63101-000, US Navy NSI 009-32

Technical Specification

Part Number	Description
A456CDUCT	Elcometer 456 Duct Deposit Measuring System
Measurement Range	0 - 1500µm (0 - 60mils)
Probe Lead Length	1.5m (5ft)
Packing List	Elcometer 456 Top Separate Gauge, Ferrous duct probe, duct cleaning template, precision foil set 25µm, 50µm, 125µm, 250µm, 500µm, 1000µm, 2mm (x2), ElcoMaster™ 2.0 software, batteries, wrist harness, carry case and operating instructions

Accessories

T456CF2B	Elcometer 456 Duct Probe
T9913939	Duct Cleaning Template
T99022255-8	Precision Foil Set: Scale 2B; 0 - 5mm (0 - 200mils)
T99022255-8C	Certified Precision Foil Set: Scale 2B; 0 - 5mm (0 - 200mils)
T99913969	Ferrous Zero Plate
T99920130	USB Bluetooth® Transmitter/Receiver

Data Management Software

Coating inspection regimes require data to be collected on many of the parameters of the coating process: surface profile, surface cleanliness, climatic conditions, film thickness and adhesion. All of these inspections generate a large amount of data.

Elcometer have designed a series of data management software packages that will link directly with the data collection devices (gauges) and instantly produce professional reports, offering full traceability of the inspection proving compliance to the relevant standard being followed.

Our free software package, ElcoMaster™ 2.0 is the most flexible data management software on the market. Designed to meet the demanding needs of the quality inspector whilst offering the ultimate flexibility for managing data into 'projects' for ease of use.

Producing professional reports is easily achieved using the standard report templates within the software package or by using the customisation options to produce customer specific reports.

Making full use of data transfer technology - Bluetooth and Cloud applications, Elcometer provides fast and efficient means of transferring and sharing data and allows fully comprehensive project reports to be generated.

The software is .pdf based which means that any document (even hand written notes) can be scanned, converted to .pdf and then stored in the project file within ElcoMaster™.

For those users wanting to transfer data into other software applications ElcoMaster™ can be configured to export data directly there is no need to use the data management aspect of the software.

As with our gauges this software is dynamic in that Elcometer are always adding new features as our customers require them.

Updates to the software are freely available over the internet and it is also possible to upgrade our inspection gauges when they are connected to ElcoMaster™ 2.0.

ElcoMaster™ 2.0 is the complete solution.

elcometer®

ElcoMaster™ 2.0
data management software

Data Management Software

Total Quality Assurance

It's not just taking measurements but what you do with the collected data that matters.

ElcoMaster™ 2.0 is a fast, easy to use software solution for all your data management, reporting and quality assurance needs.

Easy to connect
Using ElcoMaster™ 2.0's gauge wizard, connecting a gauge & downloading data (via Bluetooth or USB) is fast and easy

Inspectors are employed to inspect in the field, not write reports in the office.
With ElcoMaster™ 2.0 you can transfer inspection data from the gauges into individual spreadsheets at the click of a button, allowing you to manipulate data and generate reports.

Bluetooth®

USB

Upgrade automatically
Elcometer gauges can be automatically upgraded with the latest features simply by connecting to ElcoMaster™ 2.0

Generate automatic professional reports at the click of a button.
Using the standard report templates within ElcoMaster™ 2.0 professional reports (for climate, surface profile and dry film thickness etc.) can be produced simply and effectively within seconds.

Standard reports can be customised by adding photographs, company logo's, additional notes and drawings. Email .pdf reports directly to customers from ElcoMaster™ 2.0.

ElcoMaster™ 2.0 exports data direct to Microsoft Excel. csv, txt, cqatk formats etc. to save time and prevent keying in errors.

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Data Management Software

ElcoMaster™ 2.0
data management software

Mobile App
Add GPS location data to each measurement and view location on Google Maps.

Import existing reports
Scan your existing report into ElcoMaster™ and drag & drop all your data where you want it, then simply save and print.

Data can be stored in a simple file tree, by project and by inspection type.

Live data input
Live data input into ElcoMaster™ 2.0 and ElcoMaster™ for Android™.
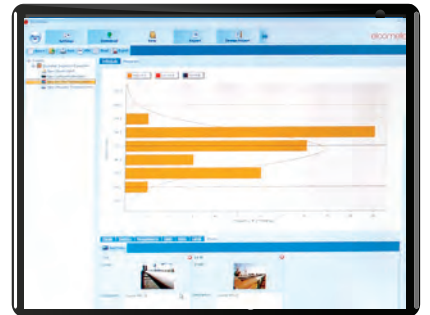
Add photographs and notes to your reports.

Cloud
Multi-site access through secure cloud computing.

Export, print or send
Export, print, .pdf or email directly from ElcoMaster™ 2.0 at the click of a button.

Using the Report Designer within ElcoMaster™, measurements can be quickly displayed on an image or drawing.

Customise and combine inspection reports on one page

A combined inspection report displaying multiple inspection parameters (such as DFT, profile, climate) together with images, notes and other project specific information in your bespoke layout sets you apart from your competition.

When inspecting in the field or on site, how can you analyse readings and download data when your PC is in the office?

ElcoMaster™ 2.0
Cloud Computing

Data Management Software

elcometer®

ElcoMaster™ Mobile App

Mobile App with ElcoMaster™

Instant communication from site to head office

You can connect Elcometer Bluetooth® enabled inspection gauges directly to Android™ mobile phones and tablets via ElcoMaster™ Mobile App.

When out in the field or on site, you can review data instantly using our free ElcoMaster™ Mobile App. All data can be emailed or transferred using the cloud option.

Easy
Intuitive, easy to use navigation system.

Relative Humidity

Mean	38.86
Std.Dev.	2.77
Max	44.5
Min	32.0
Readings	330
Other Statistics	
CV%	7.1%
# > High Limit	0
# < Low Limit	0
# < Nominal	0
# < Nominal	0
Last Measured Reading	
	17.9 °C

Versatile
Compatible with Bluetooth® models of the Elcometer 456 Coating Thickness Gauge, Elcometer 224 Surface Profile Gauge and Elcometer 319 Dewpoint Meter.

Bluetooth®

ElcoMaster™ Mobile App shares many features of ElcoMaster™ 2.0 for PC:

• Download batches from Elcometer Bluetooth® enabled gauges.

• Add notes, photographs and diagrams.

• Email reports.

• Using the phone's GPS feature, add this data to batch files.

• Use collection batch measurement location points on photos or images to indicate to users where each measurement needs to be taken.

ElcoMaster™ for Android™

Scan the QR code to download the ElcoMaster™ for Android™ Application now

elcometer®

Mobile App with ElcoMaster™

ElcoMaster™
Mobile App

Connect
Connect gauge via Bluetooth® to phone to see live readings directly on the phone and save them into batches.

Review
Review average, maximum and minimum readings instantly.

Manage & Print
Store all data; dry film thickness, surface profile, climate and manual reports in easy to manage folders.

Photos & Notes
Add photos, notes and comments.

GPS
Store GPS locations in batches and view location on Google Maps.

Cloud

Email

Send
Email inspection data from a mobile device to a PC for further analysis and reporting or transfer data via the Cloud.

Image Collection
Use measurement location points on images to indicate the position for the next reading.

With data transferred to mobile communication devices the Elcometer gauge does not have to be returned to the office for data download. Inspection work can continue without interruption.

Data Management Software

elcometer®

ElcoMaster™ 2.0
Cloud Computing

Cloud Computing with ElcoMaster™

Global real time multi-user visibility

- Create a Cloud account via a Cloud service provider e.g. Dropbox, Google Drive™, Skydrive or your own cloud based FTP server.
- For multiple users allow shared access (password protected) over various PC's, tablets and mobile phones.
- All approved users will have instant access to all data files, images in real time.
- Using the ElcoMaster™ instant messaging feature, job instructions can be sent or stored in specific job files.

Instant Access
Allows all approved users of the cloud account to have instant access to all inspection data.

3G/4G

Wi Fi

USB

Real Time Control
ElcoMaster™ 2.0 gives you real time quality control monitoring from multiple locations and multiple platforms. Data can be viewed anywhere in the world - instantly.

Send Automatically
Cloud technology allows all data to be sent automatically to all users, no requirement to email data.

Project Alpha
New York

Instant Upload
Wherever you are in the world, ElcoMaster™ Mobile App allows you to instantly upload to the cloud via 3G/4G or WiFi.

Head Quarters
London

Review
Data from multiple sites can be reviewed securely at HQ using a Cloud account.

elcometer®

Cloud Computing with ElcoMaster™

ElcoMaster™ 2.0
Cloud Computing

Secure
ElcoMaster™ 2.0 allows you to decide which Cloud Service Provider to use. It is your data, it is secure as only approved users have access - no third parties can see your data.

Collaborate
Data can be shared in different locations for closer collaboration on multinational projects.

Multi-site
ElcoMaster™ 2.0 allows you to immediately send inspection data to all colleagues and clients working on multi-site projects.

Project Delta
Shanghai

E - Messaging
Users can collaborate on projects using the internal messaging feature on ElcoMaster™

Project Delta
Singapore

Anywhere
Data can be accessed by authorised users via secure log-in from any computer or mobile device anywhere in the world via Bluetooth® USB, WiFi or 3G/4G.

Compatible
ElcoMaster™ Mobile App is compatible with Dropbox, Google Drive™, Sky Drive and FTP servers.

Monitor
Measurements, images and notes are uploaded to a user defined server on the Cloud for continuous monitoring, viewing and report generation.

works with Google Drive

FTP server

Dropbox

Data Management Software

ElcoMaster™ 2.0
Cloud Computing

The different ways ElcoMaster™ can help you do your job better

ElcoMaster™ has been designed to be a very intuitive method of developing professional reports, it is however extremely versatile. Here are just a few ways ElcoMaster™ can be used in day-to-day activities of a coating professional.

1. Gauge to PC to Excel
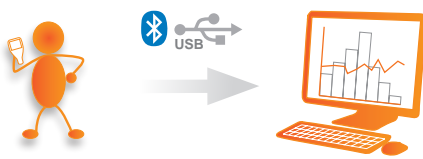
Transferring inspection data straight into Microsoft Excel via Bluetooth® or USB is simple and easy.

2. Gauge to PC data transfer into ElcoMaster™ 2.0
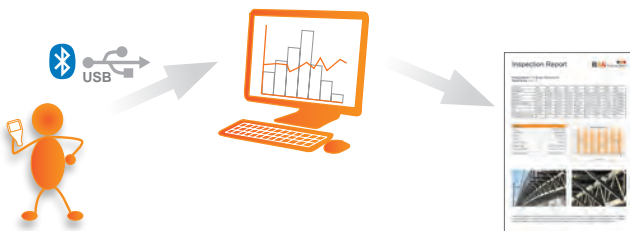
Using Bluetooth® or USB, ElcoMaster™ 2.0 transfers inspection data in seconds, archiving data and generating reports at the click of a button.

3. ElcoMaster™ Mobile App for immediate data transfer from the site to the office
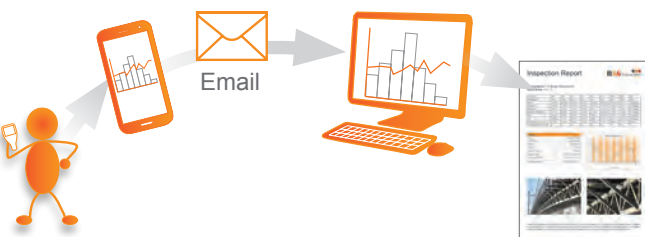
Email

Transfer inspection data straight to mobiles and tablets via Bluetooth® when on site for instant analysis, then email them back to the office for storing, review and QA reporting.

4. Upload to a cloud for real time analysis anywhere
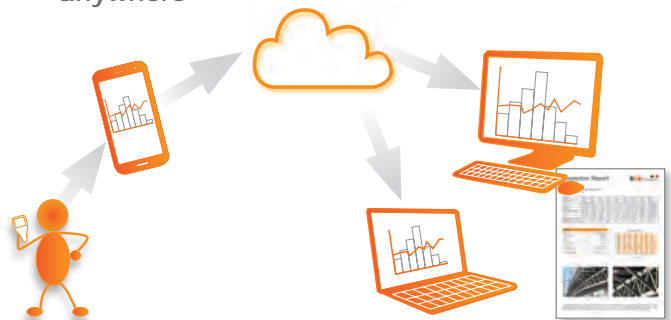
Using ElcoMaster™ Mobile App you can upload inspection data, photos, notes and GPS coordinates direct to a Cloud account of your choice via 3G/4G or WiFi.

All data is instantly visible to other approved users of the account - through a secure log-in on any computer or mobile device anywhere in the world.

5. Seamlessly link multiple sites or production lines

ElcoMaster™ 2.0 gives you real time quality control monitoring from multiple inspection projects in any location.
You can compare and combine inspection data from different production lines or different locations, to produce specific Project Inspection Reports quickly and easily.

How ElcoMaster™ Works

ElcoMaster™ 2.0
Cloud Computing

6. Real time collaboration for multi-site projects

Sub Assembly
Inspection
Reports

Final Assembly
Inspection
Reports

A

B

C

Acceptance
of Inspection
Reports

Email
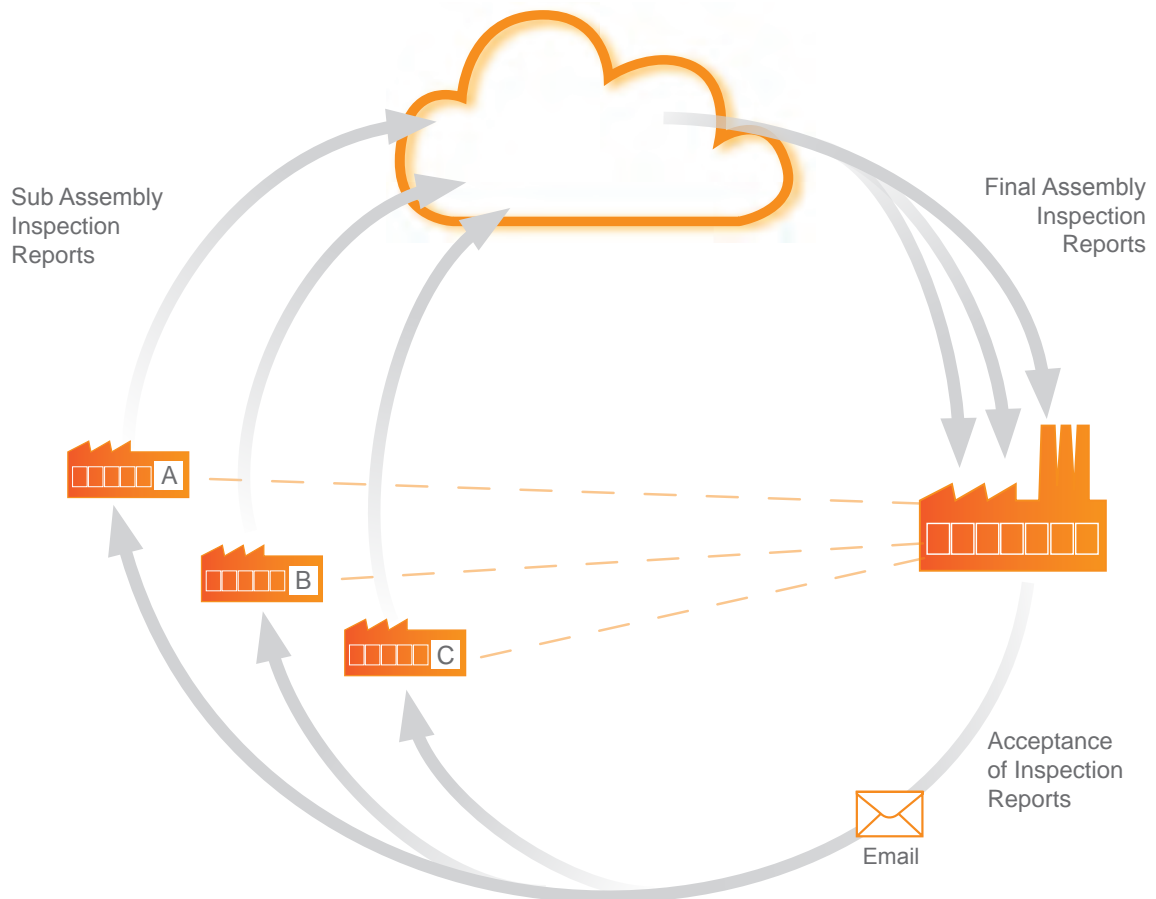
Real time collaboration for multi-site projects
When working with manufacturers of sub-assemblies across the globe ElcoMaster™ can collate all inspection data from each site, assembly line and project into one shared location. Contractors can then:

- Accept or reject parts before shipment from sub assembly plants.
- Combine all data from sub-assembly and final assembly inspection to generate Project Inspection Reports for quality management, both during the project and after completion of the project.
- Have real time in progress visibility across the whole project, no matter where the sub-assembly manufacturing is in the world.
- Have multi-site collaboration, real time dialogue and decision making to improve efficiency and quality throughout the production process.

Real time communication
Featuring instant messaging the ElcoMaster™ Mobile App lets you add messages to inspection data, projects and files, allowing you to immediately discuss key points with your colleagues, managers or clients, send work instructions and store messages within the project file.

Your data - your choice - your control
ElcoMaster™ 2.0 allows you to decide which Cloud service provider to use. It is your data, it is secure as only approved users can have access, no third parties can see your data.

ElcoMaster™ Mobile App is compatible with a range of cloud service providers and FTP servers including:

works with Google Drive

FTP server

Dropbox

elcometer®

ElcoShip®

Marine Coating Inspection Software

ElcoShip® links all the requirements of the IMO PSPC Coating Technical File in one easy to use software solution, providing real time traceable information on the status of all coating inspections throughout the ship build.
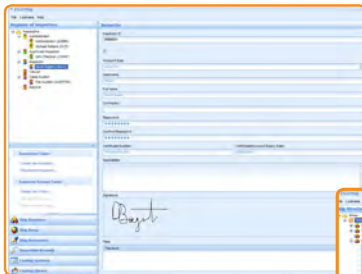
Register of Inspectors
Details of all the inspectors allocated to the ship
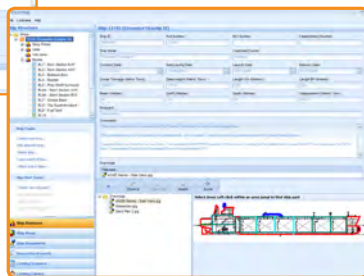
Ship Structure
Details of the ship with drawings, ship parts, highlighting the area under consideration

At all stages of manufacture, from block to final erection, in order to comply with the IMO PSPC regulations, shipyards must record, for each area under consideration:

- All coatings and approved coating systems to be used, together with Type Approval Certificates

- All Inspector's names and qualifications

- All primary and secondary stage inspection results, including:

  - Shop Primer Surface Inspection
  - Relative Humidity
  - Edge Grinding
  - Dewpoint Temperature
  - Welds & Weld Spatter
  - Dry Film Thickness with 90/10 rule
  - Oil & Grease & Dust v Film Continuity
  - Salt Cleanliness v Runs & Sags
  - Surface Profile v Damage & Inclusions
  - Surface & Air Temperatures

Coatings Library
Creation and maintenance of the approved coatings supplier
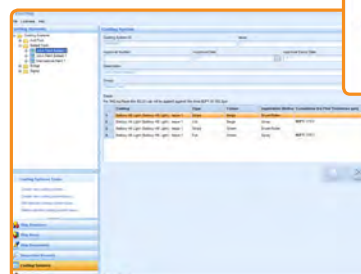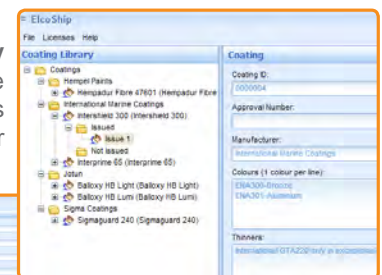
Coating System
Creation of the coating system in use for different areas of the ship

ElcoShip® is a project management planning tool which allows paperless digital data capture for all visual, manual & electronic inspection tasks as described in IMO PSPC.

Marine Coating Inspection Software

ElcoShip®

ElcoShip® provides traceable real time information on the status of all coating inspections - generating the IMO Compliant Coating Technical File at the click of a button.
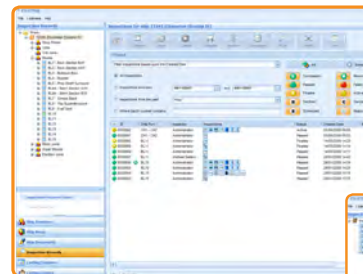
Inspection Records
Records by task, area and inspector, with any requirement for rework, and / or concessions

Inspection Regimes
Individual inspection tasks which can be grouped together for increased efficiencies
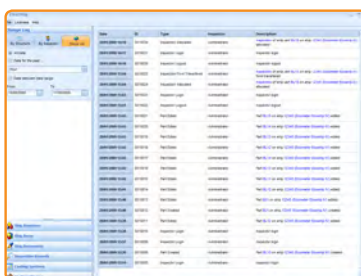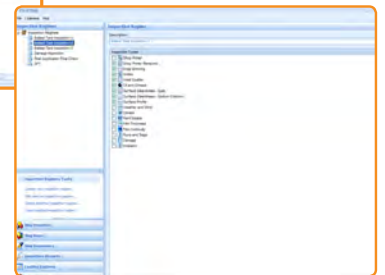
Change Log
Automatic recording of all process amendments

Daily Log
Summary of activities undertaken in the day, logging all information not included in the inspections

Through the use of mobile devices ElcoShip® can remotely schedule and allocate tasks to individual inspectors.
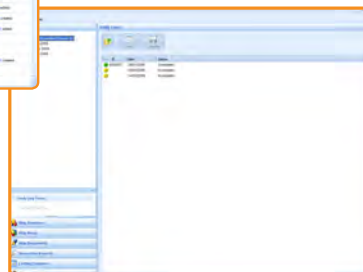
On completion of a task ElcoShip® is automatically updated with inspection records, notes and photographs, allowing inspections to continue seamlessly, without the need to return to an office to download data.

If rework is required ElcoShip® automatically links the original inspection to any subsequent rework inspection or allows concessions to be authorised and recorded when appropriate.

ElcoShip® provides task & schedule status indication – using 'traffic light' colour codes – allowing progress of the project to be monitored visually.

Measurements taken by gauges with Bluetooth wireless communications can be immediately uploaded to ElcoShip® via a PDA, for instant and accurate data management.

For further information visit www.elcoship.com.

elcometer®

ViscCalc™ App

Elcometer Viscosity Cup Convertor App

Fast and easy to use, ViscCalc™ allows viscosity (cSt) and flow times of different cups to be calculated - instantly.

Elcometer 2350, 2351, 2352, 2353, 2354
Viscosity Dip Cups

Elcometer 2435, 2436, 2437
Frikmar Viscosity Dip Cups

Elcometer 2210
Zahn Viscosity Dip Cups

Elcometer 2310
Shell Viscosity Dip Cups

Select the Elcometer Cup Type and Number
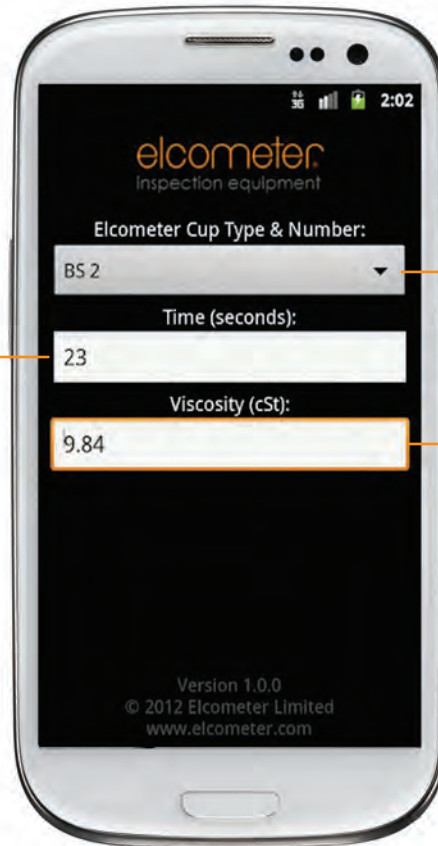
Enter the flow time in seconds

Read the Viscosity in Centistokes (cSt.)

Available for use on either Android™ or Apple mobile devices, Elcometer ViscCalc™ is the free software that quickly calculates the viscosity cup flow time in seconds into Centistokes (cSt).

Simply select the flow cup type and number from the drop down list, enter the seconds flow time and ViscCalc™ provides the viscosity in Centistokes (cSt).

Elcometer ViscCalc™ is compatible with Android™ mobile devices running Android™ 2.1 or later as well as Apple iPhone, iPod touch and iPads running iOS 4.0 or later.

Android™ is a trademark of Google Inc.
iPod, iPod touch, iPad and iTunes are trademarks of Apple Inc., registered in the US and other countries.

Standards Information

This section lists all Standards included in this catalogue. Current Standards are shown in orange and superseded Standards are shown in grey. For further information please see Standards Explained on the inside of the front cover. For the most up to date information, please refer to our website.

Standard	Reference	Elcometer Model	Page
AATCC			
AATCC Method 8	Washability & Abrasion	5750	63
ANSI			
ANSI INCITS 322	Washability & Abrasion	5135, 5155	64 - 67
ANSI/AWWA C 203	Porosity	280	224 - 227
ANSI/AWWA C 213	Porosity	266	228 - 229
ANSI/AWWA C 213	Porosity	236	230 - 231
ANSI/AWWA C 214	Porosity	280	224 - 227
AS			
AS 1580.108.2	Dry Film Thickness	141	205
AS 1580.108.2	Dry Film Thickness	121/4	204
AS 1580.213.2	Appearance	6014	98
AS 1580.408.4	Adhesion	107, 1542	217 - 218
AS 1580.408.4	Dry Film Thickness	121/4	204
AS 1580.408.5	Adhesion	106	208 - 209
AS 2331.1.3	Dry Film Thickness	101, 211	199, 200
AS 2331.1.4	Dry Film Thickness	415	197
AS 2331.1.4	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
AS 3894.1	Porosity	266	228 - 229
AS 3894.1	Porosity	236	230 - 231
AS 3894.1	Porosity	280	224 - 227
AS 3894.2	Porosity	270	222 - 223
AS 3894.3-A	Dry Film Thickness	211	200
AS 3894.3-B	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
AS 3894.4	Hardness	3101/2	77
AS 3894.4	Hardness	3092	73
AS 3894.5	Surface Preparation	125	130
AS 3894.5	Surface Preparation	127	130
AS 3894.5	Surface Preparation	129	131
AS 3894.6-A	Surface Preparation	138	136
AS 3894.6-A	Surface Preparation	138/2	142
AS 3894.6-C	Surface Preparation	142	145
AS 3894.6-D	Surface Preparation	138/2	142
AS 3894.9	Adhesion	107, 1542	217 - 218
AS 3894.9	Dry Film Thickness	121/4	204
AS/NZS			
AS/NZS 1580.107.3	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
AS/NZS 1580.107.3	Wet Film & Powder	3230	175, 176
AS/NZS 1580.108.1	Dry Film Thickness	211	200
AS/NZS 1580.108.1	Dry Film Thickness	415	197
AS/NZS 1580.108.1	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
AS/NZS 1580.204.1	Dispersion & Density	2020, 2041, 2050	2 - 3
AS/NZS 1580.213.1	Film Application	Leneta	46 - 50
AS/NZS 1580.213.2	Appearance	6014	98
AS/NZS 1580.214.1	Rotational Viscosity	2250	18 - 20

Standard	Reference	Elcometer Model	Page
AS/NZS 1580.214.2	Viscosity Cups	2354 cup 4 only	8
AS/NZS 1580.214.5	Rotational Viscosity	2300	21 - 24
AS/NZS 1580.402.1	Elasticity & Deformation	1500, 1506	82, 83
AS/NZS 1580.403.1	Hardness	3000	74
AS/NZS 1580.403.2	Washability & Abrasion	5135, 5155	64 - 67
AS/NZS 1580.406.1	Elasticity & Deformation	1615	86 - 90
AS/NZS 1580.408.5	Adhesion	106	208 - 209
AS/NZS 1580.408.5	Adhesion	1910	213
AS/NZS 1580.459.1	Washability & Abrasion	1720	56 - 61
AS/NZS 1580.601.1	Appearance	6300	102 - 103
AS/NZS 1580.601.3	Appearance	6075	100 - 101
AS/NZS 1580.602.2	Appearance	406L, 408	92 - 96
AS/NZS 4266.2	Washability & Abrasion	5135, 5155	64 - 67
ASME			
ASME B46	Surface Preparation	7061	132 - 133
ASTM			
ASTM B 244	Dry Film Thickness	355 (N1, N4)	194 - 196
ASTM B 499	Dry Film Thickness	101	199
ASTM B 499	Dry Film Thickness	211	200
ASTM B 499	Dry Film Thickness	415	197
ASTM B 499	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ASTM B 648	Hardness	3101	77
ASTM C 1353	Washability & Abrasion	5135, 5155	64 - 67
ASTM C 217	Washability & Abrasion	5135, 5155	64 - 67
ASTM C 241	Washability & Abrasion	5135, 5155	64 - 67
ASTM C 501	Washability & Abrasion	5135, 5155	64 - 67
ASTM C 536	Porosity	266	228 - 229
ASTM C 536	Porosity	236	230 - 231
ASTM C 537	Porosity	266	228 - 229
ASTM C 537	Porosity	236	230 - 231
ASTM C 584	Appearance	406L, 408	92 - 96
ASTM C 609	Appearance	6075	100 - 101
ASTM D 1044	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 1084-B	Rotational Viscosity	2300	21 - 24
ASTM D 1084-C	Rotational Viscosity	2250	18 - 20
ASTM D 1084-D	Viscosity Cups	2210	13
ASTM D 1131	Rotational Viscosity	2250	18 - 20
ASTM D 1186-B	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ASTM D 1186-B	Dry Film Thickness	415	197
ASTM D 1200	Viscosity Cups	2351, 2435	9, 11
ASTM D 1210	Dispersion & Density	2020, 2041, 2050	2 - 3
ASTM D 1212-A	Wet Film & Powder	3230	175, 176
ASTM D 1212-B	Wet Film & Powder	3233	176
ASTM D 1316	Dispersion & Density	2070	4
ASTM D 1400	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ASTM D 1400	Dry Film Thickness	415	197
ASTM D 1455	Appearance	406L, 408	92 - 96

Standards

Standard	Reference	Elcometer Model	Page
ASTM D 1475	Dispersion & Density	1800	5
ASTM D 1653	Drying Time	5100	54
ASTM D 1655	Flash Point	6910/1, 6910/3	28, 30
ASTM D 1729	Appearance	6300	102 - 103
ASTM D 1737	Elasticity & Deformation	1500, 1506	82, 83
ASTM D 1792 - 06	Washability & Abrasion	1720	56 - 61
ASTM D 2196	Rotational Viscosity	2300	21 - 24
ASTM D 2198- 02	Washability & Abrasion	1720	56 - 61
ASTM D 2197	Washability & Abrasion	5750	63
ASTM D 2200	Surface Preparation	128	114
ASTM D 2240	Hardness	3120	78
ASTM D 2244	Appearance	6075	100 - 101
ASTM D 2457	Appearance	406L, 408	92 - 96
ASTM D 2486	Film Application	Leneta	46 - 50
ASTM D 2486	Washability & Abrasion	1720, 1720 Tool 2	56 - 61
ASTM D 2583	Hardness	3101	77
ASTM D 2745	Appearance	6014	98
ASTM D 2794	Elasticity & Deformation	1615	86 - 90
ASTM D 2805	Appearance	6014	98
ASTM D 2805	Film Application	Leneta	46 - 50
ASTM D 3206 - 08	Washability & Abrasion	1720	56 - 61
ASTM D 3278	Flash Point	6910/1, 6910/3	28, 30
ASTM D 3359-B	Adhesion	107, 1542	217 - 218
ASTM D 3359-B	Dry Film Thickness	121/4 Adhesion	204
ASTM D 3363	Hardness	501, 3080, 3086	70 - 72
ASTM D 3389	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 344	Film Application	Leneta	46 - 50
ASTM D 3450	Washability & Abrasion	1720, 1720 Tool 4	56 - 61
ASTM D 3828	Flash Point	6910/1, 6910/3	28, 30
ASTM D 3884	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 3934	Flash Point	6910/1, 6910/3	28, 30
ASTM D 4039	Appearance	406L, 408	92 - 96
ASTM D 4060	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 4086	Appearance	6300	102 - 103
ASTM D 4138-A	Dry Film Thickness	141	205
ASTM D 4138-A	Dry Film Thickness	121/4	204
ASTM D 4147	Film Application	4360, 4361	37 - 38
ASTM D 4206	Flash Point	6910/2	29
ASTM D 4212	Viscosity Cups	2310	14
ASTM D 4212	Viscosity Cups	2210	13
ASTM D 4213	Washability & Abrasion	1720, 1720 Tool 5	56 - 61
ASTM D 4213:92	Washability & Abrasion	1720 Tool 3	56 - 61
ASTM D 4400	Film Application	4270	45
ASTM D 4414-A	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
ASTM D 4417	Surface Preparation	7061	132 - 133
ASTM D 4417-A	Surface Preparation	125	130
ASTM D 4417-A	Surface Preparation	127	130
ASTM D 4417-B	Surface Preparation	123, 223, 224	120 - 128
ASTM D 4417-C	Surface Preparation	122, 124	129
ASTM D 4488	Washability & Abrasion	1720	56 - 61
ASTM D 4541	Adhesion	108	215
ASTM D 4541	Adhesion	1910	213
ASTM D 4541	Adhesion	1940, 1941	210 - 212

Standard	Reference	Elcometer Model	Page
ASTM D 4541	Adhesion	106	208 - 209
ASTM D 4787	Porosity	266	228 - 229
ASTM D 4787	Porosity	236	230 - 231
ASTM D 4787	Porosity	280	224 - 227
ASTM D 4828	Washability & Abrasion	1720, 1720 Tool 3	56 - 61
ASTM D 5125	Viscosity Cups	2353, 2437	8, 11
ASTM D 5150	Film Application	Leneta	46 - 50
ASTM D 5162	Porosity	280	224 - 227
ASTM D 5162-A	Porosity	270	222 - 223
ASTM D 5162-B	Porosity	266	228 - 229
ASTM D 5162-B	Porosity	236	230 - 231
ASTM D 5178	Washability & Abrasion	5750	63
ASTM D 522-A	Elasticity & Deformation	1510	84
ASTM D 522-B	Elasticity & Deformation	1500, 1506	82, 83
ASTM D 523	Appearance	400, 406L, 408	92 - 97
ASTM D 5420	Elasticity & Deformation	1615	86 - 90
ASTM D 562	Rotational Viscosity	2250	18 - 20
ASTM D 5767	Appearance	408	92 - 95
ASTM D 6037	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 6279	Washability & Abrasion	5750	63
ASTM D 6279 - 03 (2007)	Washability & Abrasion	1720	56 - 61
ASTM D 6441	Appearance	6014	98
ASTM D 6441	Film Application	Leneta	46 - 50
ASTM D 7091	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ASTM D 7091	Dry Film Thickness	415	197
ASTM D 7234	Adhesion	106/6	214
ASTM D 7234	Adhesion	1940, 1941	210 - 212
ASTM D 7255	Washability & Abrasion	5135, 5155	64 - 67
ASTM D 7378-A	Wet Film & Powder	155	180
ASTM D 7378-C	Wet Film & Powder	550	178 - 179
ASTM D 823-C	Film Application	4340	32 - 35
ASTM D 823-E	Film Application	3505, 3520, 3525, 3530, 3540, 3550, 3560, 3570, 3580,	39 - 44
ASTM D 856	Rotational Viscosity	2250	18 - 20
ASTM D 891-B	Dispersion & Density	1800	5
ASTM E 1164	Appearance	6075	100 - 101
ASTM E 2501	Porosity	260	237
ASTM E 308	Appearance	6075	100 - 101
ASTM E 313	Appearance	6075	100 - 101
ASTM E 337-B	Climatic Testing	116	156
ASTM E 376	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ASTM E 376	Dry Film Thickness	415	197
ASTM E 502	Flash Point	6910/1, 6910/3	28, 30
ASTM E 70	Surface Preparation	148	118
ASTM E 797	Material Thickness	204 - 208	106 - 110
ASTM E 96	Drying Time	5100	54
ASTM F 1319	Washability & Abrasion	5750	63
ASTM F 1319	Washability & Abrasion	1720, 1720 Tool 8	56 - 61
ASTM F 1478	Washability & Abrasion	5135, 5155	64 - 67
ASTM F 1978	Washability & Abrasion	5135, 5155	64 - 67
ASTM F 362	Washability & Abrasion	5135, 5155	64 - 67
ASTM F 510	Washability & Abrasion	5135, 5155	64 - 67
ASTM G 12	Dry Film Thickness	101	199
ASTM G 12	Dry Film Thickness	211	200

Standard	Reference	Elcometer Model	Page
ASTM G 12	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ASTM G 6	Porosity	270	222 - 223
ASTM G 62-A	Porosity	270	222 - 223
ASTM G 62-B	Porosity	266	228 - 229
ASTM G 62-B	Porosity	236	230 - 231
BS			
BS 1344-11	Porosity	266	228 - 229
BS 1344-11	Porosity	236	230 - 231
BS 1881-207	Adhesion	106/6	214
BS 1881-207	Adhesion	1940, 1941	210 - 212
BS 2842	Climatic Testing	116	156
BS 3900- A6:1971	Viscosity Cups	2354	8
BS 3900-A11	Flash Point	6910/1, 6910/2, 6910/3	28 - 30
BS 3900-A13	Flash Point	6910/1, 6910/3	28, 30
BS 3900-A14	Flash Point	6910/1, 6910/3	28, 30
BS 3900-A7-2	Rotational Viscosity	2300	21 - 24
BS 3900-C5-5B	Dry Film Thickness	141	205
BS 3900-C5-5B	Dry Film Thickness	121/4	204
BS 3900-C5-6A	Dry Film Thickness	211	200
BS 3900-C5-6A	Dry Film Thickness	355 (F), 456 (F)	182 - 196
BS 3900-C5-6A	Dry Film Thickness	415	197
BS 3900-C5-6B	Dry Film Thickness	355 (N), 456 (N)	182 - 196
BS 3900-C5-6B	Dry Film Thickness	415	197
BS 3900-C5-7A	Wet Film & Powder	3230	175, 176
BS 3900-C5-7B	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
BS 3900-C5-7B	Wet Film & Powder	154	174
BS 3900-D4	Appearance	6014	98
BS 3900-D4	Film Application	Leneta	46 - 50
BS 3900-E1	Elasticity & Deformation	1500	82
BS 3900-E11	Elasticity & Deformation	1510	84
BS 3900-E13	Elasticity & Deformation	1615	86 - 90
BS 3900-E19	Hardness	501, 3080, 3086	70 - 72
BS 3900-E2	Hardness	3000	74
BS 3900-E4	Elasticity & Deformation	1620	85
BS 3900-E6	Adhesion	107, 1542	217 - 218
BS 3900-E6	Dry Film Thickness	121/4 Adhesion	204
BS 3900-E9	Hardness	3095	76
BS 5411-11	Dry Film Thickness	101	199
BS 5411-11	Dry Film Thickness	355 (F), 456 (F)	182 - 196
BS 5411-11	Dry Film Thickness	211	200
BS 5411-11	Dry Film Thickness	415	197
BS 5411-3	Dry Film Thickness	355 (N), 456 (N)	182 - 196
BS 5411-3	Dry Film Thickness	415	197
BS 5599	Dry Film Thickness	415	197
BS 5599	Dry Film Thickness	355 (N), 456 (N)	182 - 196
BS 5599	Washability & Abrasion	5135, 5155	64 - 67
BS 6496:1984	Elasticity & Deformation	1615	86 - 90
BS 6664-3	Flash Point	6910/1, 6910/3	28, 30
BS 6664-4	Flash Point	6910/1, 6910/3	28, 30
BS 7079-B4	Climatic Testing	319	150 - 154
BS 7079-B4	Climatic Testing	320	161 - 162
BS 7079-B4	Climatic Testing	309	155
BS 7079-C5	Surface Preparation	122, 124	129

Standard	Reference	Elcometer Model	Page
BS 7442-3.2	Hardness	3120	78
BS 7479	Hardness	1537	80
BS 7793-2	Porosity	270	222 - 223
BS 8493	Appearance	6075	100 - 101
BS 950-1	Appearance	6300	102 - 103
DIN			
DIN 1048-2	Adhesion	106/6	214
DIN 1048-2	Adhesion	1940, 1941	210 - 212
DIN 4768	Surface Preparation	7061	132 - 133
DIN 5033-2	Appearance	6075	100 - 101
DIN 5033-3	Appearance	6075	100 - 101
DIN 5033-4	Appearance	6075	100 - 101
DIN 5033-7	Appearance	6075	100 - 101
DIN 50981	Dry Film Thickness	211	200
DIN 50981	Dry Film Thickness	355 (F), 456 (F)	182 - 196
DIN 50981	Dry Film Thickness	415	197
DIN 50984	Dry Film Thickness	355 (N), 456 (N)	182 - 196
DIN 50984	Dry Film Thickness	415	197
DIN 50986	Dry Film Thickness	121/4	204
DIN 50986	Dry Film Thickness	141	205
DIN 52347	Washability & Abrasion	5135, 5155	64 - 67
DIN 53109	Washability & Abrasion	5135, 5155	64 - 67
DIN 53146	Appearance	6014	98
DIN 53152	Elasticity & Deformation	1500	82
DIN 53153	Hardness	3095	76
DIN 53156	Elasticity & Deformation	1620	85
DIN 53162-2	Film Application	Leneta	46 - 50
DIN 53167	Hardness	1538	79
DIN 53203	Dispersion & Density	2020, 2041, 2050	2 - 3
DIN 53211	Viscosity Cups	2350, 2434 cup 4 only	9, 12
DIN 53217-2	Dispersion & Density	1800	5
DIN 53232	Elasticity & Deformation	1620	85
DIN 53505	Hardness	3120	78
DIN 53754	Washability & Abrasion	5135, 5155	64 - 67
DIN 53778-2:1983	Washability & Abrasion	1720, 1720 Tool 1	56 - 61
DIN 53799	Hardness	3000	74
DIN 53799	Washability & Abrasion	5135, 5155	64 - 67
DIN 55670	Porosity	266	228 - 229
DIN 55670	Porosity	236	230 - 231
DIN 55984	Appearance	6014	98
DIN 6174	Appearance	6075	100 - 101
DIN 67530	Appearance	406L, 408	92 - 96
DIN 68861-2	Washability & Abrasion	5135, 5155	64 - 67
ECCA			
ECCA T1	Dry Film Thickness	415	197
ECCA T1	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ECCA T11	Washability & Abrasion	1720, 1720 Tool 9B	56 - 61
ECCA T12	Hardness	3000	74
ECCA T16	Washability & Abrasion	5135, 5155	64 - 67
ECCA T2	Appearance	406L, 408	92 - 96
ECCA T4	Hardness	501, 3080, 3086	70 - 72
ECCA T5	Elasticity & Deformation	1615	86 - 90

Standard	Reference	Elcometer Model	Page
ECCA T6	Adhesion	107, 1542	217 - 218
ECCA T6	Dry Film Thickness	121/4 Adhesion	204
ECCA T6	Elasticity & Deformation	1620	85
EN			
EN 10049	Surface Preparation	7061	132 - 133
EN 12206-1:2004	Elasticity & Deformation	1615	86 - 90
EN 12373-11	Appearance	406L, 408	92 - 96
EN 12373-12	Appearance	6075	100 - 101
EN 12636	Adhesion	106/6	214
EN 12636	Adhesion	1940, 1941	210 - 212
EN 12956	Washability & Abrasion	1720	56 - 61
EN 13144	Adhesion	106	208 - 209
EN 13144	Adhesion	1940, 1941	210 - 212
EN 13144	Adhesion	1910	213
EN 13329	Washability & Abrasion	5135, 5155	64 - 67
EN 1348	Adhesion	1940, 1941	210 - 212
EN 13523-1	Dry Film Thickness	415	197
EN 13523-1	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
EN 13523-11	Washability & Abrasion	1720, 1720 Tool 9B	56 - 61
EN 13523-12	Hardness	3000	74
EN 13523-15	Appearance	6075	100 - 101
EN 13523-16	Washability & Abrasion	5135, 5155	64 - 67
EN 13523-2	Appearance	406L, 408	92 - 96
EN 13523-4	Hardness	501, 3080, 3086	70 - 72
EN 13523-5	Elasticity & Deformation	1615	86 - 90
EN 13523-6	Adhesion	107, 1542	217 - 218
EN 13523-6	Dry Film Thickness	121/4 Adhesion	204
EN 13523-6	Elasticity & Deformation	1620	85
EN 13696	Washability & Abrasion	5135, 5155	64 - 67
EN 14323	Washability & Abrasion	5135, 5155	64 - 67
EN 14327	Washability & Abrasion	5135, 5155	64 - 67
EN 14354	Washability & Abrasion	5135, 5155	64 - 67
EN 14430	Porosity	266	228 - 229
EN 14430	Porosity	236	230 - 231
EN 14431	Washability & Abrasion	5135, 5155	64 - 67
EN 14688	Washability & Abrasion	5135, 5155	64 - 67
EN 14864	Washability & Abrasion	5135, 5155	64 - 67
EN 1504-2	Washability & Abrasion	5135, 5155	64 - 67
EN 15317	Material Thickness	204 - 208	106 - 110
EN 1542	Adhesion	1940, 1941	210 - 212
EN 1542	Adhesion	106/6	214
EN 21524	Dispersion & Density	2020, 2041, 2050	2 - 3
EN 22063	Hardness	1537	80
EN 233/C3.2-A	Washability & Abrasion	1720, 1720 Tool ST1	56 - 61
EN 233/C3.2-B	Washability & Abrasion	1720, 1720 Tool ST2	56 - 61
EN 233/C3.2-C	Washability & Abrasion	1720, 1720 Tool ST3	56 - 61
EN 24624	Adhesion	106	208 - 209
EN 24624	Adhesion	1910	213
EN 24624	Adhesion	1940, 1941	210 - 212
EN 438-2	Hardness	3092	73
EN 438-2	Hardness	3025	75
EN 438-2	Washability & Abrasion	5135, 5155	64 - 67
EN 456	Flash Point	6910/1, 6910/3	28, 30
EN 60730-1-A	Washability & Abrasion	1720 Tool 10	56 - 61

Standard	Reference	Elcometer Model	Page
EN 660-2	Washability & Abrasion	5135, 5155	64 - 67
FEDERAL			
P-D-220D	Washability & Abrasion	1720	56 - 61
P-R-1760	Washability & Abrasion	1720	56 - 61
P-W-155C	Washability & Abrasion	1720	56 - 61
TT-P-26C(1)	Washability & Abrasion	1720	56 - 61
TT-P-29K	Washability & Abrasion	1720	56 - 61
TT-P-30E(1)	Washability & Abrasion	1720	56 - 61
TT-P-47G	Washability & Abrasion	1720	56 - 61
TT-E-505B	Washability & Abrasion	1720	56 - 61
TT-E-506K(1)	Washability & Abrasion	1720	56 - 61
TT-E-509C	Washability & Abrasion	1720	56 - 61
TT-C-535B(2)	Washability & Abrasion	1720	56 - 61
TT-C-555B(1)	Washability & Abrasion	1720	56 - 61
FIAT			
Fiat 50411	Hardness	3120	78
FORD			
Ford BN108-02	Washability & Abrasion	5135, 5155	64 - 67
FTMS			
FTMS 141 4121	Film Application	Leneta	46 - 50
FTMS 141 4183	Dispersion & Density	1800	5
FTMS 141 4411.1	Dispersion & Density	2020, 2041, 2050	2 - 3
FTMS 141 4494.1	Film Application	4270	45
FTMS 141 Method 6141	Washability & Abrasion	1720	56 - 61
FTMS 141 Method 6142	Washability & Abrasion	1720	56 - 61
FTMS Method 536/6701	Washability & Abrasion	1720	56 - 61
G M			
GM9515P	Washability & Abrasion	5135, 5155	64 - 67
GME 60269	Washability & Abrasion	1720, 1720 Tool 9	56 - 61
IMO			
IMO MSC.215(82)	Climatic Testing	319	150 - 154
IMO MSC.215(82)	Climatic Testing	320	161 - 162
IMO MSC.215(82)	Dry Film Thickness	355 (F), 456 (F)	182 - 196
IMO MSC.215(82)	Surface Preparation	142	145
IMO MSC.215(82)	Surface Preparation	138	136
IMO MSC.215(82)	Surface Preparation	128	114
IMO MSC.215(82)	Surface Preparation	125	130
IMO MSC.244(83)	Climatic Testing	319	150 - 154
IMO MSC.244(83)	Climatic Testing	320	161 - 162
IMO MSC.244(83)	Dry Film Thickness	355 (F), 456 (F)	182 - 196
IMO MSC.244(83)	Surface Preparation	142	145
IMO MSC.244(83)	Surface Preparation	138	136
IMO MSC.244(83)	Surface Preparation	128	114
IMO MSC.244(83)	Surface Preparation	125	130
IMO PSPC	Surface Preparation	146	135
ISO			
ISO 10074	Washability & Abrasion	5135, 5155	64 - 67
ISO 105-X12	Washability & Abrasion	5750	63
ISO 105-X12	Washability & Abrasion	1720, 1720 Tool 8	56 - 61

Standard	Reference	Elcometer Model	Page
ISO 11998	Washability & Abrasion	1720, 1720 Tool 6	56 - 61
ISO 1461	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 14654	Porosity	270	222 - 223
ISO 14656	Washability & Abrasion	5135, 5155	64 - 67
ISO 1518-1:2011	Hardness	3000	74
ISO 15184	Hardness	501, 3080, 3086	70 - 72
ISO 1519-1	Elasticity & Deformation	1500	82
ISO 1519-2	Elasticity & Deformation	1506	83
ISO 1520	Elasticity & Deformation	1620	85
ISO 1524	Dispersion & Density	2020, 2041, 2050	2 - 3
ISO 16276-1	Adhesion	106	208 - 209
ISO 16276-1	Adhesion	1910	213
ISO 16276-1	Adhesion	1940, 1941	210 - 212
ISO 16276-1	Adhesion	108	215
ISO 16276-2	Adhesion	107, 1542	217 - 218
ISO 16276-2	Dry Film Thickness	121/4 Adhesion	204
ISO 19840	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 2063	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 2063	Hardness	1537	80
ISO 2178	Dry Film Thickness	101	199
ISO 2178	Dry Film Thickness	211	200
ISO 2360	Dry Film Thickness	415	197
ISO 2360	Dry Film Thickness	355 (N), 456 (N)	182 - 196
ISO 2409	Adhesion	107, 1542	217 - 218
ISO 2409	Dry Film Thickness	121/4	204
ISO 2431	Viscosity Cups	2353, 2437	8, 11
ISO 24338	Washability & Abrasion	5135, 5155	64 - 67
ISO 2555	Rotational Viscosity	2300	21 - 24
ISO 2746	Porosity	266	228 - 229
ISO 2746	Porosity	236	230 - 231
ISO 2808-12	Dry Film Thickness	415	197
ISO 2808-12	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 2808-12	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
ISO 2808-12	Dry Film Thickness	355 (N), 456 (N)	182 - 196
ISO 2808-1A	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
ISO 2808-1A	Wet Film & Powder	154	174
ISO 2808-1B	Wet Film & Powder	3230	175, 176
ISO 2808-5B	Dry Film Thickness	141	205
ISO 2808-5B	Dry Film Thickness	121/4	204
ISO 2808-6A	Dry Film Thickness	211	200
ISO 2808-6A	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 2808-6A	Dry Film Thickness	415	197
ISO 2808-6B	Dry Film Thickness	121/4	204
ISO 2808-6B	Dry Film Thickness	355 (N), 456 (N)	182 - 196
ISO 2808-6B	Dry Film Thickness	415	197
ISO 2808-6B	Dry Film Thickness	141	205
ISO 2808-7A	Dry Film Thickness	211	200
ISO 2808-7A	Wet Film & Powder	3230	175, 176
ISO 2808-7B	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
ISO 2808-7B	Wet Film & Powder	154	174
ISO 2808-7C	Dry Film Thickness	355 (F), 456 (F)	182 - 196
ISO 2808-7C	Dry Film Thickness	415	197
ISO 2808-7D	Dry Film Thickness	355 (N), 456 (N)	182 - 196
ISO 2808-7D	Dry Film Thickness	415	197

Standard	Reference	Elcometer Model	Page
ISO 2811-1	Dispersion & Density	1800	5
ISO 2813	Appearance	406L, 408	92 - 96
ISO 2814	Appearance	6014	98
ISO 2814	Film Application	Leneta	46 - 50
ISO 2815	Hardness	3095	76
ISO 2884-2	Rotational Viscosity	2300	21 - 24
ISO 29601	Porosity	266	228 - 229
ISO 29601	Porosity	236	230 - 231
ISO 29601	Porosity	280	224 - 227
ISO 3537	Washability & Abrasion	5135, 5155	64 - 67
ISO 3668	Appearance	6300	102 - 103
ISO 3679	Flash Point	6910/1, 6910/3	28, 30
ISO 3680	Flash Point	6910/1, 6910/3	28, 30
ISO 4287	Surface Preparation	7061	132 - 133
ISO 4287/1	Surface Preparation	7061	132 - 133
ISO 4586-2	Hardness	3092	73
ISO 4586-2	Hardness	3025	75
ISO 4586-2	Washability & Abrasion	5135, 5155	64 - 67
ISO 4624	Adhesion	106	208
ISO 4624	Adhesion	1910	213
ISO 4624	Adhesion	1940, 1941	210 - 212
ISO 5470-1	Washability & Abrasion	5135, 5155	64 - 67
ISO 6272:1993	Elasticity & Deformation	1615	86 - 90
ISO 6272-1	Elasticity & Deformation	1615	86 - 90
ISO 6272-2	Elasticity & Deformation	1615	86 - 90
ISO 6504-3	Appearance	6014	98
ISO 6860	Elasticity & Deformation	1510	84
ISO 7253	Hardness	1537	80
ISO 7267-2	Hardness	3120	78
ISO 7668	Appearance	406L, 408	92 - 96
ISO 7724-2	Appearance	6075	100 - 101
ISO 7724-3	Appearance	6075	100 - 101
ISO 7783-1	Drying Time	5100	54
ISO 7783-2	Drying Time	5100	54
ISO 7784-1	Washability & Abrasion	5135, 5155	64 - 67
ISO 7784-2	Washability & Abrasion	5135, 5155	64 - 67
ISO 8289-A	Porosity	270	222 - 223
ISO 8501-1	Surface Preparation	128	114
ISO 8502-11	Surface Preparation	134 CSN	139
ISO 8502-3	Surface Preparation	142	145
ISO 8502-4	Climatic Testing	319	150 - 154
ISO 8502-4	Climatic Testing	320	161 - 162
ISO 8502-4	Climatic Testing	309	155
ISO 8502-5	Surface Preparation	134S	141
ISO 8502-5	Surface Preparation	134 CSN	139
ISO 8502-6	Surface Preparation	138	136
ISO 8502-6	Surface Preparation	135A, 135B	137
ISO 8502-9	Surface Preparation	138	136
ISO 8502-9	Surface Preparation	146	135
ISO 8503-1	Surface Preparation	125	130
ISO 8503-2	Surface Preparation	125	130
ISO 8503-5	Surface Preparation	122, 124	129
ISO 868	Hardness	3120	78
ISO 9038	Flash Point	6910/2	29

Standards

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Standard	Reference	Elcometer Model	Page
NF T30-125	Wet Film & Powder	154	174
NF T30-125	Wet Film & Powder	3233	176
NF T30-125	Wet Film & Powder	3230	175, 176
NF T30-606	Adhesion	108	215
NF T30-606	Adhesion	106	208 - 209
NF T30-606	Adhesion	1940, 1941	210 - 212
NF T36-006	Appearance	6075	100 - 101
NF T51-123	Hardness	3120	78
NF T51-174	Hardness	3120	78
NF X08-012-1	Appearance	6075	100 - 101
NF X08-012-2	Appearance	6075	100 - 101

PSA			
PSA D45 1010	Washability & Abrasion	1720, 1720 Tool 8	56 - 61

SAE			
SAE J 1530	Washability & Abrasion	5135, 5155	64 - 67
SAE J 1847	Washability & Abrasion	5135, 5155	64 - 67
SAE J 365	Washability & Abrasion	5135, 5155	64 - 67
SAE J 948	Washability & Abrasion	5135, 5155	64 - 67
SAE J361	Appearance	6300	102 - 103

SANS			
SANS 5772	Surface Preparation	123, 223, 224	120 - 128

SIS			
SIS 923509	Washability & Abrasion	5135, 5155	64 - 67

SS			
SS 184159	Dry Film Thickness	355 (N), 456 (N)	182 - 196
SS 55900	Surface Preparation	128	114
SS 923509	Washability & Abrasion	5135, 5155	64 - 67

SSPC			
SSPC	Surface Preparation	146	135
SSPC Guide 15	Surface Preparation	130	134
SSPC Guide 15	Surface Preparation	134S	141
SSPC Guide 15	Surface Preparation	138	136
SSPC Guide 15	Surface Preparation	134 CSN	139
SSPC Guide 15	Surface Preparation	138/2	142
SSPC PA2	Dry Film Thickness	101	199
SSPC PA2	Dry Film Thickness	211	200
SSPC PA2	Dry Film Thickness	355 (F), 456 (F)	182 - 196
SSPC VIS 1	Surface Preparation	128	114
SSPC VIS 2	Surface Preparation	128	114
SSPC VIS 3	Surface Preparation	128	114
SSPC VIS 4	Surface Preparation	128	114
SSPC VIS 5	Surface Preparation	128	114

TAPPI			
TAPPI T 476	Washability & Abrasion	5135, 5155	64 - 67
TAPPI T 515	Appearance	6300	102 - 103
TAPPI T 653	Appearance	406L, 408	92 - 96

Standard	Reference	Elcometer Model	Page
UNE			
UNE 135203-1	Washability & Abrasion	5135, 5155	64 - 67
UNE 48250	Washability & Abrasion	5135, 5155	64 - 67
UNE 56842	Washability & Abrasion	5135, 5155	64 - 67
UNE 56843	Washability & Abrasion	5135, 5155	64 - 67
UNE 56868	Washability & Abrasion	5135, 5155	64 - 67
UNE 57095	Washability & Abrasion	5135, 5155	64 - 67
US NAVY			
US Navy 009-32 FY12	Surface Preparation	146	135
US Navy NSI 009-32	Climatic Testing	319	150 - 154
US Navy NSI 009-32	Climatic Testing	320	161 - 162
US Navy NSI 009-32	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
US Navy NSI 009-32	Surface Preparation	138	136
US Navy NSI 009-32	Surface Preparation	128	114
US Navy NSI 009-32	Surface Preparation	122, 124	129
US Navy NSI 009-32	Surface Preparation	123, 223, 224	120 - 128
US Navy NSI 009-32	Wet Film & Powder	112, 115, 3236, 3238	172 - 174
US Navy PPI 63101-000	Climatic Testing	319	150 - 154
US Navy PPI 63101-000	Climatic Testing	320	161 - 162
US Navy PPI 63101-000	Dry Film Thickness	355 (F,N), 456 (FNF)	182 - 196
US Navy PPI 63101-000	Surface Preparation	142	145
US Navy PPI 63101-000	Surface Preparation	138	136
US Navy PPI 63101-000	Surface Preparation	128	114
US Navy PPI 63101-000	Surface Preparation	122, 124	129
US Navy PPI 63101-000	Surface Preparation	123, 223, 224	120 - 128
US Navy PPI 63101-000	Wet Film & Powder	112, 115, 3236, 3238	172 - 174

Appendix

What is the correct probe for each Coating/Substrate?

The table below shows common coating/substrate combinations. if you do not see your coating/substrate combination, please contact Elcometer to discuss your particular requirement.

Elcometer offers a free Test Sample Report. Contact us to arrange for our Technical Department to establish the most appropriate gauge for your process or application.

COATING	Aluminimum	Brass	Bronze	Copper	Steel	Magnesium	Stainless Steel	Titanium	Uranium	Zinc
					SUBSTRATE					
Aluminium	-	-	-	-	F	-	-	-	-	-
Anodising	NF	-	-	-	-	NF	-	-	-	-
Brass	-	-	-	-	F	-	-	-	-	-
Bronze	-	-	-	-	F	-	-	-	-	-
Cadmium	-	-	-	-	F	-	-	-	-	-
Ceramic	-	-	-	-	F	-	-	-	-	-
Chrome (Hard)	NF*	-	-	NF*	F	-	-	-	-	-
Copper	-	-	-	-	F	-	-	-	-	-
Eloxal	NF	-	-	-	F	-	-	-	-	-
Eproxy	NF	NF	NF	NF	F	-	NF	NF	-	NF
Galvanising	-	-	-	-	F	-	-	-	-	-
Lacquer	NF	NF	NF	NF	F	-	NF	-	-	NF
Metal Spray	-	-	-	-	F	-	-	-	-	-
Molybenum Disulphide	-	-	-	-	F	-	NF	-	-	-
Nickel (Electroless)	NF*	NF*	-	NF*	F	-	-	-	-	-
Paint	NF	NF	NF	NF	F	NF	NF	NF	NF	NF
Plastic	NF	NF	NF	NF	F	NF	NF	NF	NF	NF
Plating	-	-	-	-	F	-	-	-	-	-
Rubber	NF	-	-	-	F	-	-	-	NF	-
Resist	-	-	-	NF	-	-	-	-	-	-
Tin	-	-	-	-	F	-	-	-	-	-
Varnish	NF	NF	NF	NF	F	-	-	-	-	-
Zinc	-	-	-	-	F	-	-	-	-	-

NF : use Non-Ferrous probe
 F : use Ferrous probe
 * : known sample required for calibration

Index

D

E

Index

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Elcometer has a range of test equipment for:

Coating Inspection
A comprehensive range of test equipment from the laboratory to the field

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Cable Location
Live cable location, cable avoidance tools, pipe location, etc.

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