elcometer®

Industrial Finishing & Physical Test Equipment



industrial finishing inspection & physical test equipment

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Divisions of Elcometer

Blast Equipment

The Elcometer range of high performance abrasive blast machines, media valves, air handling, blast hose, blast nozzles, personal protective equipment and blast inspection & test equipment is engineered to be tough, safe and incredibly durable.

Spray Equipment

To meet the needs of the automotive refinishing, industrial finishing and refinishing markets the Elcometer Spray Equipment range of spray guns, fluid application & filtration systems and personal protective equipment ensures a fast and efficient high quality finish.

Coatings Inspection

Ever since our first coating thickness gauge in 1947, Elcometer has been a world leader in the design, manufacture & supply of inspection equipment to the coatings inspection industry, building a global network in 170 countries to meet the needs of the protective & industrial coatings industries.

NDT Equipment

Accurate and easy to use, Elcometer's NDT inspection equipment is ideal for measuring material thickness, sound velocity and detecting a wide range of flaws in a variety of materials, perfect for corrosion assessment in a broad range of industry applications.

Elcometer's **Coatings Inspection Equipment** division is divided into two distinct sectors:



Industrial finishing & physical test equipment

a full range of inspection equipment designed for the industrial finishing, powder coating and general manufacturing industry, whether you are on a production line or in a paint laboratory, in quality assurance or an academic institution..



Protective coatings inspection equipment

for more information on Elcometer's range of inspection equipment for the protective coatings industry, from offshore platforms to shipyards, bridges to wind farms, mining to reservoirs, visit protective.elcometer.com.

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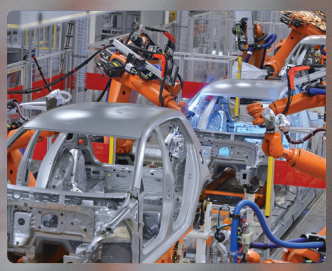





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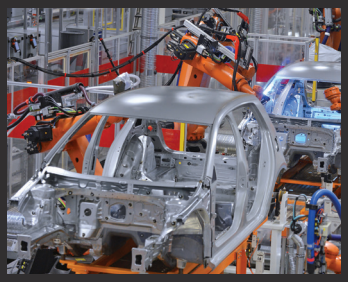
With a range of products specifically developed to meet the needs of the industrial finishing industry, **Elcometer** is well positioned to provide you with **the solution to your inspection and physcial test** requirements, whatever and wherever they might be.

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Our Company

We will ensure that Elcometer is the leading manufacturer and supplier of quality control instrumentation within the inspection, Monitoring & Control sector.

This will be achieved through the design, manufacture and supply of industry leading, innovative, high quality products; supported by a best-in-class customer experience and delivered by a highly capable and motivated team, within a culture of continuous improvement and in accordance with ISO 9001.


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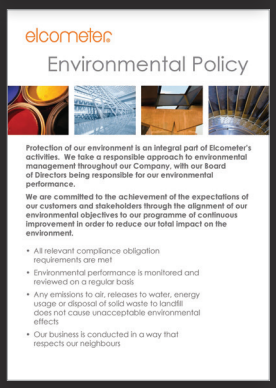
Our Values

Our Values Shape Our Culture.

- Pride;
  We are proud of where we work and the work we do
- Ownership;
  We take responsibility for what we do and how we do it
- Ethics;
  We treat our customers, suppliers and colleagues fairly and with respect
- Achievement;
  We believe that just enough is not enough
- Focus;
  We know that if it is not acceptable to us it is not acceptable to our customers
- Initiative;
  We are encouraged to identify opportunities for improvement and offer solutions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Environmental Policy

Protection of our environment is an integral part of Elcometer's activities. We take a responsible approach to environmental management throughout our Company, with our Board of Directors being responsible for our environmental performance.

We are committed to the achievement of the expectations of our customers and stakeholders through the alignment of our environmental objectives to our programme of continuous improvement in order to reduce our total impact on the environment.

- All relevant compliance obligation requirements are met
- Environmental performance is monitored and reviewed on a regular basis
- Any emissions to air, releases to water, energy usage or disposal of solid waste to landfill does not cause unacceptable environmental effects
- Our business is conducted in a way that respects our neighbours

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

Ever since the first Elcometer gauge was manufactured in 1947, our philosophy has been to provide industry leading, innovative, high quality products; supported by a best-in-class customer experience at a competitive price. By concentrating on these core values, Elcometer has grown into a global network with representation in over 170 countries.

In 2003 Elcometer acquired two leading European manufacturers to expand its product range to include physical test equipment. Elcometer continued to invest and develop its physical test equipment range to offer over 50 products today.

For more information on Elcometer's range of industrial coating and physical test equipment, visit www.elcometer.com.

Our Values

Pride;	We are proud of where we work and the work we do
Ownership;	We take responsibility for what we do and how we do it
Ethics;	We treat our customers, suppliers and colleagues fairly and with respect
Achievement;	We believe that just enough is not enough
Focus;	We know that if it is not acceptable to us it is not acceptable to our customers
Initiative;	We are encouraged to identify opportunities for improvement and offer solutions

Quality is part of our culture

Elcometer's commitment to quality is reflected in our ISO 9001 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, the manufacture or our commitment to our customers.

We are committed to meet or exceed the expectations of our customers and stakeholders by aligning our quality objectives for product, sales and service performance and delivery.

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

To view all our Company Policies and ISO certifications, visit www.elcometer.com

Service and Support

Elcometer has Distributor representation in over 170 countries around the world, all comprehensively trained on our products, providing a full after sales and support service 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 facilities in England, Germany, United Arab Emirates or the USA. For more information please contact Elcometer.

Fit for Purpose

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.

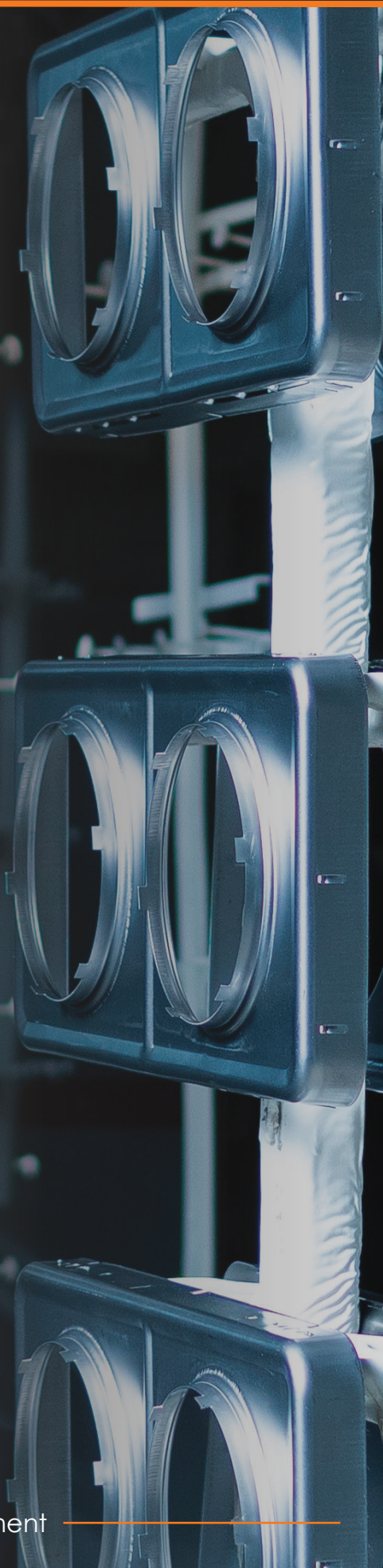
In this catalogue, we have identified the latest National and International Standards - those in Orange are current and those in Grey have been superseded but are still recognised in some industries.

We continuously review our products against current and new Standards. For the most up to date list of Standards, 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.



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Whether you're looking to **find out more** about an Elcometer product, its **application** or learn more about **optimal use** of an instrument, **Elcometer's videos** provide a quick and simple guide.

For our full video library visit **elcometer.tv**

Elcometer products with a video will show the '**video available**' symbol

etv video available elcometer.tv


degussa®



Dispersion & Density

1



From the development of coatings, inks & cosmetics 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

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.

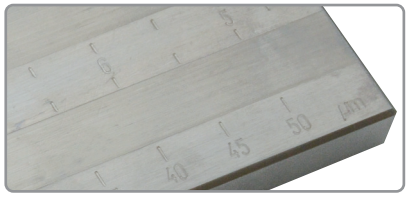
As the Specific Gravity Cup is an exact measurement of the volume of the liquid, it is imperative that the exact weight of the sample is obtained.

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

Elcometer 2020

Fineness of Grind Gauges (Dual Channels)





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

The Elcometer 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, 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 an accuracy of ±3µm (0.12mil) or ±5% whichever is the greater. The groove width for all models is 12mm (0.47”) with a groove length of 127mm (5.0”).

etv video available elcometer.tv

Technical Specification

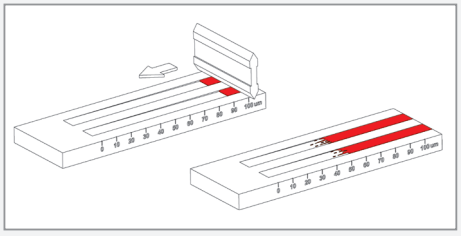
Part Number Metric	Model	Range (µm)	Range (mils)	Graduation (µm)	Graduation (mils)	Hegman (NS or H)	Paint Club (PCU)	Certificate
K0002020M003	Elcometer 2020/3	0 - 15	-	1.5	-	8 - 7	10 - 9	○
K0002020M004	Elcometer 2020/4	0 - 25	0 - 1	2.5	0.1	8 - 6	10 - 8	○
K0002020M001	Elcometer 2020/1	0 - 50	0 - 2	5	0.2	8 - 4	10 - 5	○
K0002020M002	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 Fineness of Grind Gauge, scraper, plastic case and operating instructions							

Accessories

KT002020N001	Replacement Scraper for Elcometer 2020

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.

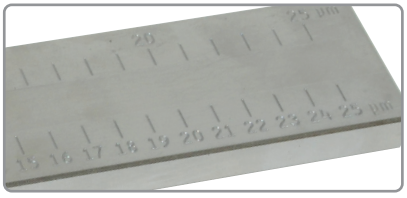


○ Optional Calibration Certificate available.

Elcometer 2050

High Precision Grindometer (Single Channel)





This single channel 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.

Manufactured out of hardened stainless steel each gauge is graduated in microns on the top to an accuracy of ±3µm (0.12mil) or ±5% whichever is the greater. 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

etv video available elcometer.tv

Technical Specification

Part Number Metric	Model	Range (µm)	Range (mils)	Graduation (µm)	Graduation (mils)	Certificate
K0002050M001	Elcometer 2050/1	0 - 25	0 - 1	1	0.05	○
K0002050M002	Elcometer 2050/2	0 - 50	0 - 2	2	0.1	○
K0002050M005	Elcometer 2050/5	0 - 100	0 - 4	5	0.2	○
K0002050M008	Elcometer 2050/8	0 - 250	0 - 10	12.5	0.5	○
Accuracy	±3µm (0.12mil) or ±5% whichever is the greater					
Packed Dimensions	312 x 270 x 79mm (12.3 x 10.6 x 3.1”)					
Packed Weight	1.75kg (3.85lb)					
Packing List	Elcometer 2050 High Precision Grindometer, scraper, transit case and operating instructions					

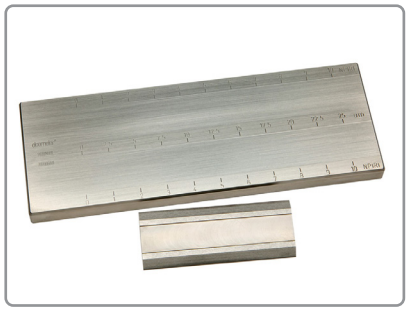
Accessories

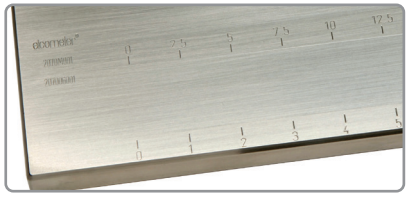
KT002030N001	Replacement Scraper for Elcometer 2050

○ Optional Calibration Certificate available.

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 according to the National Printing Inks Research Institute (NPIRI) scale.

As ink particles are so fine, the two grooves of the gauge have a gentle gradient allowing a scale of 2.5µm for better resolution.

The groove width is 25mm (0.98”) and the groove length is 165mm (6.5”). The NPIRI scale is displayed alongside the microns scale. The NPIRI gauge and its scraper are made of hardened stainless steel.

STANDARDS:
ASTM D 1316

etv video available elcometer.tv

Technical Specification

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	○
Accuracy	±3µm (0.12mil) or ±5% whichever is the greater						
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

○ Optional Calibration Certificate available.

Elcometer 1800

Density Cup



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

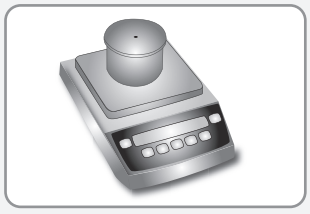
The density cup consists of a cylindrical container and lid with a hole for the exhaust of excess liquid.

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

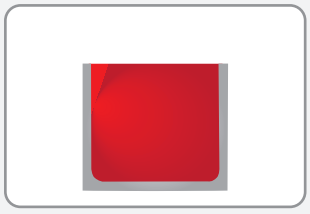
Technical Specification

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



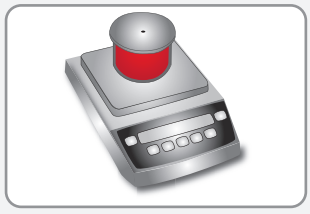
1. Weigh the cup and lid when empty



2. Fill the cup with liquid to the very top



3. Carefully place the lid on the cup then remove any excess liquid*



4. Weigh the full cup and the lid then subtract the empty cup and lid weight

5. Divide the weight of the liquid by the cup volume/capacity to determine the Specific Gravity
The formulae for calculating Density and Specific Gravity are:

$$\text{Density} = \frac{\text{Liquid Weight}}{\text{Cup Volume}}$$

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

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

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

● Certificate supplied as standard.

Elcometer 8720

Compact Balance





The Elcometer 8720 Compact Balance is very easy to use and offers extensive weighing functions selectable by the user.

- Weighing range from 0 to 1,200g (0 - 42.3oz)
- Backlit LCD display
- 130 x 130mm stainless steel weighing plate

Technical Specification

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK8720M001C	K0008720M001C	K0US8720M001C	Elcometer 8720 Compact Balance - Certified	●
Range	0 - 1,200g (0 - 42.3oz)			
Reproducibility	0.01g (0.0004oz)			
Linearity	±0.03g (0.001oz)			
Dimensions	167 x 250 x 85mm (6.6 x 9.8 x 3.3”)			
Weight	2kg (4.4lb)			
Packing List	Elcometer 8720 Compact Balance, power cable and operating instructions			

● Certificate supplied as standard.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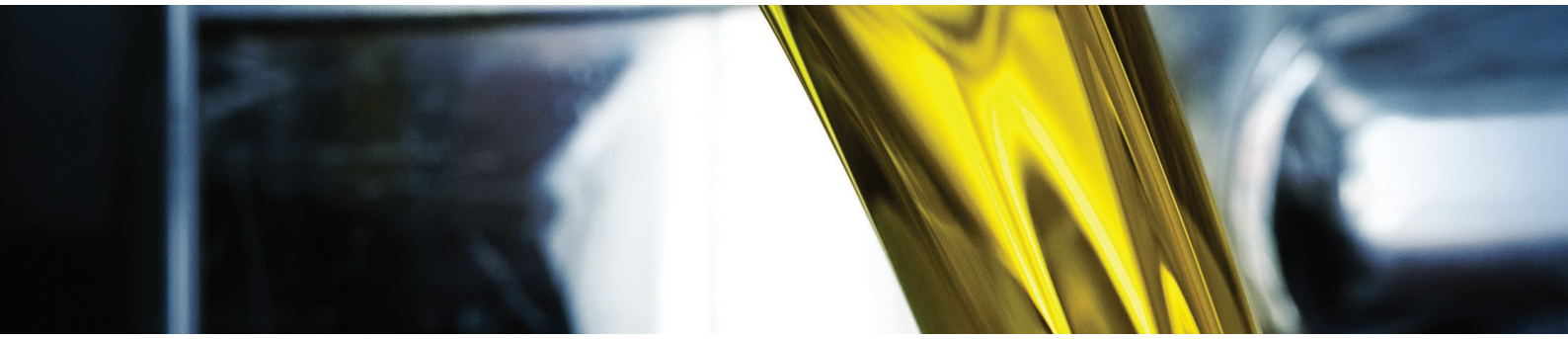
Viscosity

Flow Cups & Dip Cups

2



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, these include;

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: 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 page 2-4.

Non-Newtonian fluids: fluids which change viscosity when a force is applied, e.g. paints and ketchup, etc. Non-Newtonian fluids are usually measured using RotationalViscometers.

Fast and easy to use - **ElcoCalc**™ instantly converts viscosity cup flow time in seconds into Centistokes (cSt).

Save time converting viscosity cup flow time into Centistokes (cSt) by using Elcometer's free app, ElcoCalc™, available from the Android or Apple App stores.

ElcoCalc™ works out the viscosity in Centistokes for you – simply choose your cup type, enter the flow time, and ElcoCalc™ does the rest.

ElcoCalc™ is free software that is available on Android™ and the App Store. Compatible with Android™ mobile devices running Android™ 2.1 or later and also iPod, iPhone and iPad running iOS 4.0 or later.



Elcometer 2350, 2351, 2352, 2353, 2354 Viscosity Flow Cups



Elcometer 2434, 2435, 2436, 2437 Frikmar Viscosity Dip Cups



Elcometer 2210 Zahn Viscosity Dip Cups



Elcometer 2310 Shell Viscosity Dip Cups



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Elcometer 2350 & 2354

Viscosity Flow Cups



STANDARDS:
ISO: ISO 2431
AS/NZS: AS/NZS 1580.214.2 (cup 4), AS/NSZ 1580.214.6:1995
BS: BS 3900-A6:1971
FORD/ASTM: ASTM D 1200, D 5125
DIN: DIN 53211 (cup 4)
AFNOR: NF T30-014

The very easy to use Viscosity Flow Cups are 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 ElcoCalc™ Mobile App.

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. They can also be supplied with a flow jacket for temperature control (thermojacket), see page 2-6 for more information.

compatible with ElcoCalc™

etv video available elcometer.tv

Technical Specification

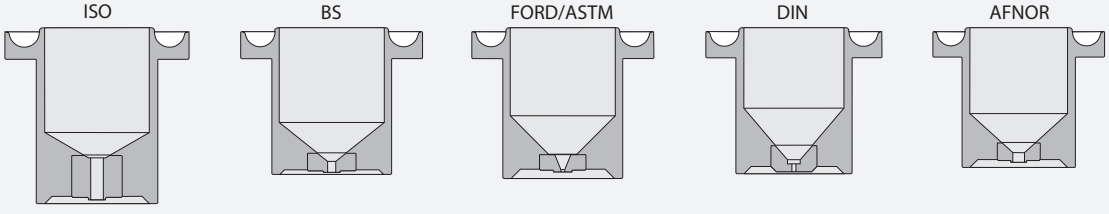
BS Viscosity Flow Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002354M003	Elcometer 2354/3 BS Viscosity Cup 4	3.97mm	89 - 340	◇
K0002354M003C	Elcometer 2354/3 with calibration certificate	3.97mm	89 - 340	● [3]

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	-	● [2]
K0002350M002C	Elcometer 2350/2 with calibration certificate	4mm	96 - 683	● [3]
K0002350M003C	Elcometer 2350/3 with calibration certificate	6mm	-	● [2]
K0002350M004C	Elcometer 2350/4 with calibration certificate	8mm	-	● [2]

Viscosity Flow Cups - Cup Designs



[1] For Information Only
[2] Dimensional Certificate
[3] Efflux Time Certificate

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

Elcometer 2351, 2352 & 2353 Viscosity Flow Cups

Technical Specification

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	● [3]
K0002353M002C	Elcometer 2353/2 with calibration certificate	4mm	34 - 135	● [3]
K0002353M003C	Elcometer 2353/3 with calibration certificate	5mm	91 - 326	● [3]
K0002353M004C	Elcometer 2353/4 with calibration certificate	6mm	188 - 684	● [3]
K0002353M005C	Elcometer 2353/5 with calibration certificate	8mm	-	● [3]

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 - 1,200	◇
K0002351M001C	Elcometer 2351/1 with calibration certificate	1.90mm	10 - 35	● [3]
K0002351M002C	Elcometer 2351/2 with calibration certificate	2.53mm	25 - 120	● [3]
K0002351M003C	Elcometer 2351/3 with calibration certificate	3.40mm	49 - 220	● [3]
K0002351M004C	Elcometer 2351/4 with calibration certificate	4.12mm	70 - 370	● [3]
K0002351M005C	Elcometer 2351/5 with calibration certificate	5.20mm	200 - 1,200	● [3]

AFNOR Viscosity Cups[4]

Part Number	Description	Orifice Diameter	Certificate
K0002352M001	Elcometer 2352/1 AFNOR Viscosity Cup 2.5	2.46mm	
K0002352M002	Elcometer 2352/2 AFNOR Viscosity Cup 4	4mm	
K0002352M003	Elcometer 2352/3 AFNOR Viscosity Cup 6	6mm	
K0002352M001C	Elcometer 2352/1 with calibration certificate	2.46mm	● [2]
K0002352M002C	Elcometer 2352/2 with calibration certificate	4mm	● [2]
K0002352M003C	Elcometer 2352/3 with calibration certificate	6mm	● [2]

[1] For Information Only
[2] Dimensional Certificate
[3] Efflux Time Certificate
[4] No calculation to convert flow time into Centistokes (cSt)

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

Elcometer Viscosity Flow Cups Accessories

Accessories



KT002400N201	Viscosity Cup Stand with Bubble Level and Glass Draw Plate To ensure the viscosity cup is positioned correctly to carry out the test.



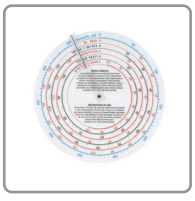
KT002400N001	Viscosity Cup Precision Stand with Bubble Level and Glass Draw Plate To ensure the viscosity cup is positioned correctly to carry out the test.
KT002400P001	Bubble Level for Viscosity Cup To ensure the viscosity cup is parallel to the surface.
KT002400P999	Viscosity Glass Draw Plate To retain test sample until operator is ready to commence test and provides surface for bubble level.



KT002400N202	Viscosity Cup Precision Stand with Thermojacket
KT002400N002	Thermojacket for Viscosity Cup Precision Stand For heating test samples for viscosity measurement at specific elevated temperatures.



K0007300M201	Elcometer 7300 High Precision Stopwatch



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

Thermometers



To accurately measure flow for viscosity the temperature needs to be 23°C ±2°C (73.4°F ±3.6°F). Here are a range of thermometers from Elcometer. For more information see page 8-11.

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 8-12
G213----2	Elcometer 213/2 Digital Thermometer (°C/°F)
T9996390-	Elcometer 213/2 Liquid Probe
	For more information see page 8-13



For a full range of Calibration Oils see page 2-11

Elcometer 2435 & 2437

Viscosity Dip Cups - Frikmar







STANDARDS:
DIN: DIN 53211 (cup 4 only)
FORD/ASTM: ASTM D 1200, D 5125
ISO: ISO 2431
AFNOR: NF T30-014

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 other 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 1,100cSt.

compatible with ElcoCalc™

etv video available elcometer.tv

Technical Specification

FORD/ASTM Viscosity Dip Cups Part Number	Description	Orifice Diameter	Range[1] (cSt)	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	● [3]

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 2437/4 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	● [3]
K0002437M003C	Elcometer 2437/3 with calibration certificate	4mm	34 - 135	● [3]
K0002437M006C	Elcometer 2437/6 with calibration certificate	5mm	91 - 326	● [3]
K0002437M004C	Elcometer 2437/4 with calibration certificate	6mm	188 - 684	● [3]
K0002437M005C	Elcometer 2437/5 with calibration certificate	8mm	-	● [2]



For a full range of Calibration Oils see page 2-11

[1] For Information Only
[2] Dimensional Certificate
[3] Efflux Time Certificate

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

Elcometer 2434 & 2436 Viscosity Dip Cups - Frikmar

Technical Specification

DIN Viscosity Dip Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
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	-	● [2]
K0002434M002C	Elcometer 2434/2 with calibration certificate	4mm	96 - 683	● [3]
K0002434M003C	Elcometer 2434/3 with calibration certificate	6mm	-	● [2]
K0002434M004C	Elcometer 2434/4 with calibration certificate	8mm	-	● [2]

AFNOR Viscosity Dip Cups

Part Number	Description	Orifice Diameter	Range[1] (cSt)	Certificate
K0002436M001	Elcometer 2436/1 AFNOR Dip Cup 4	3.99mm	50 - 1,100	
K0002436M001C	Elcometer 2436/1 with calibration certificate	3.99mm	50 - 1,100	● [2]

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 - 1,100



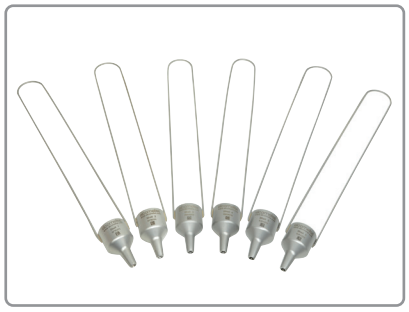
For a full range of Calibration Oils see page 2-11

[1] For Information Only
[2] Dimensional Certificate
[3] Efflux Time Certificate

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

Elcometer 2310

Shell Viscosity Dip Cups







The Elcometer 2310 Shell Viscosity Dip Cups are stainless steel 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 diameter sizes available, for measurements between 2 and 1,300cSt.

STANDARDS:
ASTM D 4212

compatible with ElcoCalc™

etv video available elcometer.tv

Technical Specification

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	● [2]
K0002310M002C	Elcometer 2310/2 with calibration certificate	2.4mm	10 - 50	● [2]
K0002310M003C	Elcometer 2310/3 with calibration certificate	3.1mm	30 - 120	● [2]
K0002310M004C	Elcometer 2310/4 with calibration certificate	3.8mm	70 - 270	● [2]
K0002310M005C	Elcometer 2310/5 with calibration certificate	4.6mm	125 - 520	● [2]
K0002310M006C	Elcometer 2310/6 with calibration certificate	5.8mm	320-1300	● [2]



For a full range of accessories see page 2-6

[1] For Information Only
[2] Efflux Time Certificate

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

Elcometer 2210

Zahn Viscosity Dip Cups







STANDARDS:
ASTM D 1084-D, ASTM D 4212

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 1,840cSt.

Technical Specification

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 - 1,110	◇
K0002210M005	Elcometer 2210/5 Zahn Dip Cup 5	5.3mm	460 - 1,840	◇
K0002210M001C	Elcometer 2210/1 with calibration certificate	1.8mm	5 - 56	● [2]
K0002210M002C	Elcometer 2210/2 with calibration certificate	2.7mm	21 - 231	● [2]
K0002210M003C	Elcometer 2210/3 with calibration certificate	3.8mm	146 - 848	● [2]
K0002210M004C	Elcometer 2210/4 with calibration certificate	4.3mm	222 - 1,110	● [2]
K0002210M005C	Elcometer 2210/5 with calibration certificate	5.3mm	460 - 1,840	● [2]



For a full range of Calibration Oils see page 2-11

[1] For Information Only
[2] Efflux Time Certificate

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

Elcometer 2410



Elcometer Viscosity Dip Cup Standard Calibration Oils

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.

compatible with ElcoCalc™

etv video available elcometer.tv

Technical Specification

	Suitable for									
	Dip Cups					Flow Cups				
Part Number	Zahn	DIN Frikmar	ASTM/FORD Frikmar	ISO Frikmar	Shell	DIN	ASTM/FORD	ISO	Kinematic Viscosity at 25°C (77°F)*	Certificate
K0002410M021	1			3	2		2	3	34cSt	●
K0002410M022	2	4		4	4	4	3	4	120cSt	●
K0002410M023	3	4	4	6	5	4	4	6	230cSt	●
K0002410M024	4	4		6	6	4		6	420cSt	●
K0002410M025	5								710cSt	●
K0002410M026	6								1,200cSt	●

* Nominal Value

● Calibration certificate supplied as standard.

Elcometer 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.

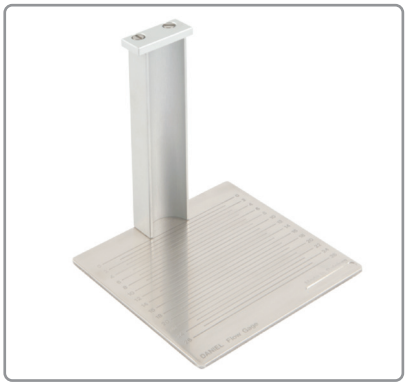
Each cup design is unique, care must be taken when comparing viscosity values between different cup types. These values are the absolute values and do not include the allowed tolerances, as these differ considerably between each of the Standards.

Efflux Time (seconds)	Flow Cup Type & Number																						
	DIN	BS				ISO				FORD / ASTM				ZAHN					SHELL					
	4	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			35	66			35	66			19	40		4	88	148	322			20	48	91	235
16	45			39	75			39	75			22	44		7	99	163	345			21	52	98	251
17	51			43	84			43	84			24	48		11	111	178	368			23	55	104	267
18	57			47	93			47	93			26	52		14	123	192	391	1.1	7.5	24	59	111	284
19	63			51	101			51	101		1	29	56		18	135	207	414	1.4	8.1	26	62	117	300
20	69			55	110			55	110		3	31	60		**21**	**146**	**222**	437	1.6	8.6	27	66	**124**	**316**
21	74			58	118			58	118		4	33	64		**25**	**158**	**237**	**460**	1.8	9.2	29	69	**130**	**332**
22	80			62	126			62	126		6	36	67		**28**	**170**	**252**	**483**	**2.0**	**9.8**	**30**	**72**	**137**	**348**
23	85	1		66	134	1		66	134		7	38	**71**		**32**	**181**	**266**	**506**	**2.3**	**10.4**	**32**	**76**	**143**	**365**
24	91	2		70	142	2		70	142		9	40	**75**		**35**	**193**	**281**	**529**	**2.5**	**10.9**	**33**	**79**	**150**	**381**
25	**96**	3		73	150	3		73	150		10	43	**79**		**39**	**205**	**296**	**552**	**2.7**	**11.5**	**35**	**83**	**156**	**397**
26	**101**	4		77	157	4		77	157		12	45	**83**		**42**	**216**	**311**	**575**	**2.9**	**12.1**	**36**	**86**	**163**	**413**
27	**107**	4.5		80	165	4.5		80	165		13	47	**87**		**46**	**228**	**326**	**598**	**3.2**	**12.7**	**38**	**90**	**169**	**429**
28	**112**	5		84	173	5		84	173		14	**49**	**91**		**49**	**240**	**340**	**621**	**3.4**	**13.2**	**39**	**93**	**176**	**446**
29	**117**	6		88	180	6		88	180		16	**52**	**94**		**53**	**252**	**355**	**644**	**3.6**	**13.8**	**41**	**97**	**182**	**462**
30	**122**	**6.6**	**34.5**	**91**	**188**	**6.6**	**34.5**	**91**	**188**		17	**54**	**98**	1	**56**	**263**	**370**	**667**	**3.8**	**14.4**	**42**	**100**	**189**	**478**
31	**127**	**7.3**	**36.0**	**95**	**196**	**7.3**	**36.0**	**95**	**196**		19	**56**	**102**	2	**60**	**275**	**385**	**690**	**4.1**	**15.0**	**44**	**104**	**195**	**494**
32	**132**	**7.9**	**37.5**	**98**	**203**	**7.9**	**37.5**	**98**	**203**		20	**59**	**106**	3	**63**	**287**	**400**	**713**	**4.3**	**15.6**	**45**	**107**	**202**	**510**
33	**137**	**8.6**	**38.0**	**102**	**210**	**8.6**	**38.0**	**102**	**210**		22	**61**	**110**	4	**67**	**298**	**414**	**736**	**4.5**	**16.1**	**47**	**110**	**208**	**527**
34	**142**	**9.2**	**41.0**	**105**	**218**	**9.2**	**41.0**	**105**	**218**		23	**63**	**114**	**6**	**70**	**310**	**429**	**759**	**4.7**	**16.7**	**48**	**114**	**215**	**543**
35	**147**	**9.8**	**42.0**	**109**	**225**	**9.8**	**42.0**	**109**	**225**		**24**	**66**	**117**	**7**	**74**	**322**	**444**	**782**	**5.0**	**17.3**	**50**	**117**	**221**	**559**
36	**152**	**10.4**	**44.0**	**112**	**233**	**10.4**	**44.0**	**112**	**233**		**26**	**68**	**121**	**8**	**77**	**333**	**459**	**805**	**5.2**	**17.9**	**51**	**121**	**228**	**575**
37	**157**	**11.0**	**45.2**	**115**	**240**	**11.0**	**45.2**	**115**	**240**		**27**	**70**	**125**	**9**	**81**	**345**	**474**	**828**	**5.4**	**18.4**	**53**	**124**	**234**	**591**
38	**162**	**11.6**	**47.0**	**119**	**247**	**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**	**12.1**	**48.0**	**122**	**254**	**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**	**12.7**	**50.0**	**126**	**262**	**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**	**13.3**	**51.2**	**129**	**269**	**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**	**13.8**	**53.0**	**133**	**276**	**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**	**14.4**	**54.0**	**136**	**283**	**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**	**14.9**	**56.0**	**139**	**291**	**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**	**15.5**	**57.0**	**143**	**298**	**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**	**16.0**	**59.0**	**146**	**305**	**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**	**16.6**	**60.0**	**149**	**312**	**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**	**17.1**	**62.0**	**153**	**319**	**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**	**17.6**	**63.5**	**156**	**326**	**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**	**18.2**	**64.5**	**160**	**334**	**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**	**18.7**	**66.0**	**163**	**341**	**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**	**19.2**	**67.5**	**166**	**348**	**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**	**19.7**	**69.0**	**170**	**355**	**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**	**20.2**	**70.0**	**173**	**362**	**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**	**20.7**	**71.5**	**176**	**369**	**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**	**21.2**	**73.0**	**180**	**376**	**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**	**21.7**	**75.0**	**183**	**383**	**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**	**22.2**	**76.0**	**186**	**390**	**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**	**22.7**	**77.0**	**190**	**397**	**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**	**23.2**	**79.0**	**193**	**405**	**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**	**26**	**86.0**	**210**	**440**	**26**	**86.0**	**210**	**440**	**15**	**68**	**135**	**233**	**40**	**179**	**673**	**888**	**1472**	**11.8**	**34.6**	**95**	**221**	**416**	**1045**
70	**313**	**28**	**93.0**	**226**	**475**	**28**	**93.0**	**226**	**475**	**17**	**75**	**147**	**252**	**45**	**196**	**731**	**962**	**1587**	**12.9**	**37.4**	**103**	**238**	**449**	**1126**
75	**337**	**31**	**100**	**243**	**510**	**31**	**100**	**243**	**510**	**20**	**82**	**158**	**271**	**51**	**214**	**790**	**1036**	**1702**	**14.0**	**40.3**	**110**	**255**	**481**	**1207**
80	**360**	**33**	**108**	**260**	**545**	**33**	**108**	**260**	**545**	**22**	**89**	**170**	**291**	**56**	**231**	**848**	**1110**	**1817**	**15.1**	**43.2**	**118**	273	**514**	**1288**
85	**383**	**35**	**115**	**276**	**580**	**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**	**122**	**293**	**615**	**38**	**122**	**293**	**615**	**27**	**104**	**193**	**329**	67	266	965	1258	2047	**17.4**	**49.0**	133	307	579	1450
100	**452**	**42**	**135**	**326**	**684**	**42**	**135**	**326**	**684**	**32**	**118**	**216**	**368**	78	301	1082	1406	2277	**19.7**	54.7	148	342	644	1612
110	**499**	47		359	754	47		359	754	**37**	**132**	**239**	406	89	336	1199	1554	2507	21.9	60.5	163	376	709	1774
120	**545**	51		392	823	51		392	823	42	147	**262**	445	100	371	1316	1702	2737	24.2	66.2	178	411	774	1936
130	**591**	56		425	893	56		425	893	47	161	285	483	111	406	1433	1850	2967	26.4	72.0	193	445	839	2098
140	**637**	61		458	962	61		458	962	51	176	308	522	122	441	1550	1998	3197	28.7	77.8	208	480	904	2260
150	**682**	65		491	1031	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

Elcometer 2290

Daniel Flow Gauge



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

A material is poured into the semi-cylindrical reservoir. When the gauge 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

Fast and easy to use - **ElcoCalc™** instantly converts viscosity cup flow time in seconds into Centistokes (cSt).



Save time converting viscosity cup flow time into Centistokes (cSt) by using Elcometer's free app, ElcoCalc™, available from the Android or Apple App stores.

ElcoCalc™ works out the viscosity in Centistokes for you – simply choose your cup type, enter the flow time, and ElcoCalc™ does the rest.

ElcoCalc™ is free software that is available on Android™ and the App Store. Compatible with Android™ mobile devices running Android™ 2.1 or later and also iPod, iPhone and iPad running iOS 4.0 or later.

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elcometer®

Flash Point



3



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. 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, these include;

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 in saving costs.

Flash point tests using the “rapid equilibrium” method: Traditional equilibrium flash point tests such as ISO1516 and ISO1523, use 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 (0.067fl oz) or 4ml (0.135fl oz) sample which achieves rapid temperature equilibrium and gives a reliable flash point result in just one or two minutes.

Elcometer 6910/1

Setaflash ‘Series 3’ Closed Cup Tester







STANDARDS:
ASTM D1655, ASTM D3278, ASTM D3828, ASTM E502, BS 2000-523, CLP Regulations EC No 1272/2008, DEF STAN 91-91, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

The Elcometer 6910/01 Closed Cup Tester is an easy to use instrument that can complete a flash/no flash test in less than two minutes or determine the flash point of a sample within a temperature range of ambient to 300°C (ambient to 572°F).

It provides fast and reliable flash point results and requires minimum operator skills. Test parameters, instrument status and test results are accessed via the touch screen display and a push button, which guide the operator through a straightforward testing process.

An audible prompt is sounded when a flash is achieved. An automatic flash detector reduces the chance of misinterpretation of the test result by the operator and enhanced repeatability. For easy record keeping the instrument stores 100,000 test results, which can be saved and transferred via the USB port.

Gas for the test jet shutter assembly is supplied from an integral gas tank, which is filled using a standard butane (lighter) refill cartridge.

- Flash point test in less than 2 minutes
- Small sample size, 2ml (0.067fl oz) or 4ml (0.135fl oz)
- Automatic flash detection
- Automatic barometric correction
- USB port and result storage
- Colour touch screen
- Portable
- Simple calibration

Technical Specification

Part Number	Description	Certificate
K6910M010	Elcometer 6910/1 Setaflash ‘Series 3’ Closed Cup Tester	○
Temperature Range	Ambient to 300°C (Ambient to 572°C)	
Sample Size	2ml (0.067fl oz) or 4ml (0.135fl oz)	
Fuel Supply	Integrated gas tank (removable)	
Cup Material	Aluminium	
Dimensions	195 x 295 x 140mm (7.6 x 11.6 x 5.5”)	
Data Storage and Download	1GB internal memory and integrated USB port	
Pressure Correction	Automatic barometric correction	
Weight	3kg (6.6lb)	
Packing List	Elcometer 6910 Setaflash ‘Series 3’ Closed Cup Tester, 2ml (0.067fl oz) syringe, gas valve & cap, viton ‘O’ ring, mains power cable, 2mm Allen key, quick start guide, USB memory stick with user manual, quality assurance certificate and warranty registration form	

Accessories

KT006910N001	Cooling Module Option for 5°C (41°F) Ambient Temperature
KT006910N009	Certified Flash Point Material (50ml/1.7floz)

○ Optional Calibration Certificate available.

Elcometer 6910/2

Setaflash ‘Series 3’ Open Cup Tester







STANDARDS:
ASTM D1655, ASTM D3278, ASTM D3828, ASTM E502, BS 2000-523, CLP Regulations EC No 1272/2008, DEF STAN 91-91, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

The Elcometer 6910/2 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-flammable” by combustibility testing. This has significant potential cost reduction implications for the packaging, storage and shipping of many materials.

The Elcometer 6910/2 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 (ambient to 572°F).

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

- Flash point test in less than 2 minutes
- Small sample size, 2ml (0.067fl oz)
- Audible and on-screen prompts
- Portable
- Simple calibration

Technical Specification

Part Number			Description	Certificate
UK 240V	EUR 220V	US 110V		
K0UK6910M011	K0006910M011	K0US6910M011	Elcometer 6910/2 Setaflash ‘Series 3’ Open Cup Tester	○
Temperature Range	Ambient to 300°C (Ambient to 572°F)			
Sample Size	2ml (0.067fl oz)			
Test Time	1 minute for flash points up to 100°C (212°F)			
	2 minutes for flash points above 100°C (212°F)			
Temperature Measurement	0.5°C (1.0°F) resolution 0.5°C (1.0°F) accuracy			
Cup Material	Blackened aluminium			
Dimensions	260 x 280 x 260mm (10.2 x 11.0 x 10.2”)			
Weight	5kg (11.0lb)			
Packing List	Elcometer 6910 Setaflash ‘Series 3’ Open Cup Tester, 2ml (0.067fl oz) syringe, gas valve & cap, 105mm silicone tube, test flame height gauge, mains power cable, inspection certificate, warranty registration form and operating instructions			

Accessories

KT006910N001	Cooling Module Option for 5°C (41°F) Ambient Temperature
KT006910N009	Certified Flash Point Material (50ml/1.7fl oz)

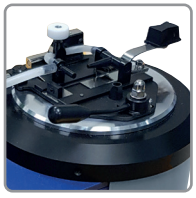
○ Optional Calibration Certificate available.

Elcometer 6910/3

Setaflash ‘Series 3’ Active-Cool Closed Cup Tester







STANDARDS:
ASTM D1655, ASTM D3278, ASTM D3828, ASTM D7236, ASTM E502, BS 2000-523, DEF STAN 91-91, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

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. A sample cup is heated and then cooled by Peltier cells. This gives very accurate and stable sub-ambient test temperatures and the benefit of rapid temperature normalisation between tests.

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.

- Flash/No Flash & Ramp Modes
- Flash point test in less than 2 minutes
- Small sample size, 2ml (0.067fl oz) or 4ml (0.135fl oz)
- Automatic flash detection
- Electronic Peltier cooling
- Audible and on-screen prompts
- Portable
- Corrosion resistant cup insert

Technical Specification

Part Number	Description	Certificate
K6910M013	Elcometer 6910/3 Setaflash ‘Series 3’ Active-Cool	○
Temperature Range	10°C to 135°C (50°F to 275°F)	
Test Modes	Rapid Equilibrium and Ramp	
Sample Size	2ml (0.067fl oz) for flash points up to 100°C (212°F)	
	4ml (0.135fl oz) for flash points above 100°C (212°F)	
Test Duration	1 minute below 100°C, 2 minutes above 100°C, or user determined 1 to 99 minutes	
Ramp Rate	2°C/min ramp (3.6°F/min ramp)	
Cup Material	Corrosion resistant steel insert	
Dimensions	195 x 295 x 140mm (7.6 x 11.6 x 5.5”)	
Weight	3kg (6.6lb)	
Packing List	Elcometer 6910 Setaflash ‘Series 3’ Active-Cool Closed Cup Tester, 2ml (0.067fl oz) syringe, gas valve & cap, power supply, mains power cable, 2mm Allen key, quality assurance certificate, warranty registration form and operating instructions	

Accessories

KT006910N009	Certified Flash Point Material (50ml/1.7fl oz)

○ Optional Calibration Certificate available.

Elcometer 6910

Setaflash ‘Series 8’ Closed Cup Tester







STANDARDS:
ASTM D3278, ASTM D3828, ASTM D7236, ASTM E502, BS 2000-523, CLP Regulations EC No 1272/2008, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

The Elcometer 6910 Setaflash ‘Series 8’ is an automated closed cup tester with a temperature range of ambient to 300°C (ambient to 572°F).

Test parameters, instrument status and flash point results are shown on the bright colour LCD display - all easily accessed via menus, navigated by the keypad, which guides the operator through a straightforward testing process.

The instrument uses an electric hot wire ignitor and is designed with two modes of flash point operation; Flash/No Flash and Ramp. Ramp Mode increases the sample temperature at the rate of 2°C/min and automatically dips the ignitor every 1°C up to 100°C (every 2°C above 100°C), until either a flash is detected or the end of test temperature is reached.

During the test the automatic flash point is set to ignore halo and other false flash effects reducing the risk of inaccurate test results and enhancing repeatability. At the end of the flash point test, the sample cup is cooled by forced air to reduce the cycle time between tests.

Up to 64 results can be stored in the memory which can be downloaded to a PC or printer via the USB port for further reporting.

- Small sample size, 2ml (0.067fl oz) or 4ml (0.135fl oz)
- Flash/No Flash & Ramp Modes
- Electric ignitor
- Automatic dipping and flash detection
- 64 test memory
- Forced air cooling for rapid test cycling

Technical Specification

Part Number	Description	Certificate
K6910M020	Elcometer 6910 Setaflash ‘Series 8’ Closed Cup Tester	●
Temperature Range	Ambient to 300°C (Ambient to 572°F)	
Sample Size	2ml (0.067fl oz) or 4ml (0.135fl oz) according to method	
Test Modes	Rapid Equilibrium and Ramp	
Test Duration Rapid Equilibrium Mode	1 minute below 100°C (212°F), 2 minutes above 100°C (212°F)	
Test Duration Ramp Mode	Typically 7 minutes	
Cool Down Time	80°C to 20°C (176°F to 68°F) in 4 minutes	
Cup Material	Aluminium	
Dimensions	300 x 340 x 380mm (11.8 x 13.4 x 15.0”)	
Weight	8kg (17.6lb)	
Packing List	Elcometer 6910 Setaflash ‘Series 8’ Closed Cup Tester, mains power cable, 2ml (0.067fl oz) syringe, programming plug, 2mm Allen key, 2.5mm Allen key, ‘O’ ring fitted, certified flash point material (50ml/1.7fl oz), quality assurance certificate and operating instructions	

Accessories

KT006910N009	Certified Flash Point Material (50ml/1.7fl oz)

● Calibration Certificate supplied as standard.

Elcometer 6910

Setaflash ‘Series 8’ Active-Cool Closed Cup Tester







STANDARDS:
ASTM D3278, ASTM D3828, ASTM D7236, ASTM E502, BS 2000-523, CLP Regulations EC No 1272/2008, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

The Elcometer 6910 Setaflash ‘Series 8’ Active-Cool Closed Cup Tester offers the same features as the Setaflash ‘Series 8’ Closed Cup Tester but is designed with a temperature range of -20°C to 130°C (-4°F to 266°F) with no external cooling required. When connected to a suitable water supply, the range is extended down to -20°C (- 4°F) and operates with an electric ignition.

This Active Cool Closed Cup Tester uses the Peltier cell technology for heating and cooling, ensuring precise temperature control and rapid cool down after a test is completed.

- Small sample size, 2ml (0.067fl oz) or 4ml (0.135fl oz)
- Flash/No Flash & Ramp Modes
- Electric ignitor
- Automatic dipping and flash detection
- Active-Cool electronic Peltier cooling
- 64 test memory & USB port

Technical Specification

Part Number	Description	Certificate
K6910M021	Elcometer 6910 Setaflash ‘Series 8’ Active-Cool Closed Cup Tester	●
Temperature Range	-30°C to 135°C (-22°F to 275°F)	
Sample Size	2ml (0.067fl oz) or 4ml (0.135fl oz) according to method	
Test Modes	Rapid Equilibrium and Ramp	
Test Duration Rapid Equilibrium Mode	1 minute below 100°C (212°F), 2 minutes above 100°C (212°F), FAME 1 minute or user defined 1 to 99 minutes	
Test Duration Ramp Mode	Typically 7 minutes	
Cool Down Time	80°C to 20°C (176°F to 68°F) in 4 minutes	
Cup Material	Aluminium	
Dimensions	300 x 340 x 380mm (11.8 x 13.4 x 15.0”)	
Weight	8kg (17.6lb)	
Packing List	Elcometer 6910 Setaflash ‘Series 8’ Active-Cool Closed Cup Tester, 2ml (0.067fl oz) syringe, ignitor, mains power cable, programming plug, 2mm Allen key, 2.5mm Allen key, certified flash point material (50ml/1.7fl oz), certificate of calibration, warranty registration form and operating instructions	

Accessories

KT006910N009	Certified Flash Point Material (50ml/1.7fl oz)

● Calibration Certificate supplied as standard.

Elcometer 6910

Setaflash ‘Series 8’ Active-Cool (Corrosion Resisting)







STANDARDS:
ASTM D3278, ASTM D3828, ASTM D7236, ASTM E502, BS 2000-523, CLP Regulations EC No 1272/2008, EPA 1020 A & B, ISO 3679, ISO 3680, UN Class 3 Non-viscous Flammable Liquids

The Elcometer 6910 Setaflash ‘Series 8’ Active-Cool (Corrosion Resisting) offers the same feature as the Active Cool Closed Cup Tester but comes with a corrosion resisting insert in the cup for testing corrosive samples.

It has been designed to carry out flash/no flash tests with a temperature range of 10°C to 130°C (50°F to 266°F) with no external cooling required. When connected to a suitable chilled water supply, the range is extended down to -20°C (-4°F).

There is also the Ramp Mode which increases the sample temperature at the rate of 2°C/min and automatically dips the ignitor every 1°C up to 100°C (every 2°C above 100°C), until either a flash is detected or the end of test temperature is reached.

- Small sample size, 2ml (0.067fl oz) or 4ml (0.135fl oz)
- Flash/No Flash & Ramp Modes
- Electric ignitor
- Automatic dipping and flash detection
- ActiveCool electronic Peltier cooling
- 64 test memory & USB port
- Corrosion resisting insert

Technical Specification

Part Number	Description	Certificate
K6910M022	Elcometer 6910 Setaflash ‘Series 8’ Active-Cool (Corrosion Resisting)	●
Temperature Range	-30°C to 135°C (-22°F to 275°F)	
Sample Size	2ml (0.067fl oz) or 4ml (0.135fl oz) according to method	
Test Modes	Rapid Equilibrium and Ramp	
Test Duration Rapid Equilibrium Mode	1 minute below 100°C (212°F), 2 minutes above 100°C (212°F), FAME 1 minute or user defined 1 to 99 minutes	
Test Duration Ramp Mode	Typically 7 minutes	
Cool Down Time	80°C to 20°C (176°F to 68°F) in 4 minutes	
Cup Material	Corrosion Resistant Steel Insert, Aluminium Cup	
Dimensions	300 x 340 x 380mm (11.8 x 13.4 x 15.0”)	
Weight	8kg (17.6lb)	
Packing List	Elcometer 6910 Setaflash ‘Series 8’ Active-Cool (Corrosion Resisting), 2ml (0.067fl oz) syringe, flash detector, mains power cable, programming plug, 2mm Allen key, 2.5mm Allen key, certified flash point material (50ml/1.7fl oz), certificate of calibration, warranty registration form and operating instructions	

Accessories

KT006910N009	Certified Flash Point Material (50ml/1.7fl oz)

● Calibration Certificate supplied as standard.

elcometer®



Take accurate and repeatable 20°, 60° & 85° Gloss, % Reflectance and haze measurements at 3 readings per second for all angles with the **Elcometer 480 Glossmeter.**

See page 14-5


elcometer®



Film Application & Test Charts

Automatic Film Applicators & Vacuum Tables 4-3

Bar Coaters, Applicators & Sag Tests 4-8

Test Charts 4-18

4



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.

Any measurements made on coatings for the purpose of describing their physical properties (drying time, elasticity, abrasion, 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.

Elcometer's range of Motorised Film Applicators has been designed specifically to ensure the greatest levels of repeatability and reproducibility by ensuring:

- Constant speed of application
- Smoothness of operation - ensuring no jerks which create ridges and variation in thickness

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 97.7µm (3.9mils) and 102.3µm (4.1mils). On glass, the readings produced would be between 88µm (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 Charts covers a variety of testing needs including the hiding power of coatings, ink qualities, penetration, spreading rates and opacity.

Elcometer 4340 Motorised/Automatic Film Applicator

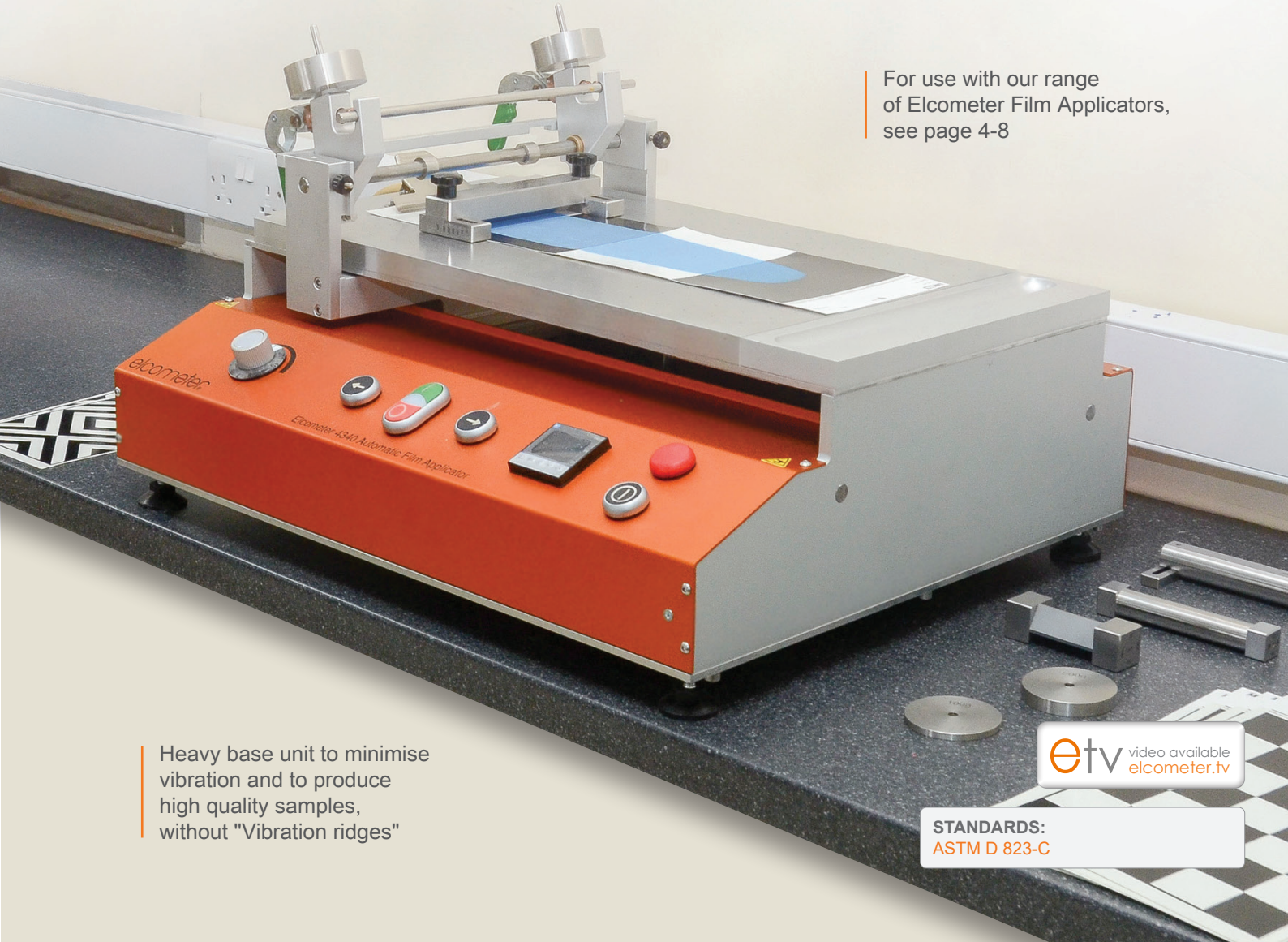
The **Elcometer 4340** Motorised Film Applicator is essential for preparing a wide variety of product samples including paint, varnish, cosmetics and glue.

Ideal for testing liquids including:
paint, varnish, cosmetics and glue

Precision engineered flat aluminium table for better repeatability
- 5 times flatter than glass

Standard table &
perforated or channelled
vacuum tables available

For use with our range
of Elcometer Film Applicators,
see page 4-8



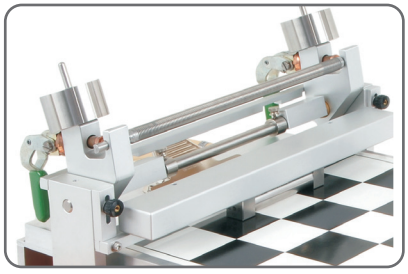
Heavy base unit to minimise
vibration and to produce
high quality samples,
without "Vibration ridges"

etv video available elcometer.tv

STANDARDS:
ASTM D 823-C

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.



Durable & Rugged

- Sturdy rigid design to eliminate vibration during film application
- Up to 15 years of standard use



Choice of Table

- Standard flat table
- Single and double channelled vacuum tables
- Perforated and heated vacuum tables
- Electrically heated sample tables available for temperature control



Smooth & Repeatable Tests

- Use up to 3 film applicators simultaneously
- Test up to 2 test charts simultaneously
- 11 pre-set transverse speeds from 0.2 - 3.9 inches per second

Elcometer 4340

Motorised/Automatic Film Applicator



The Elcometer 4340 range of Motorised Film Applicators allows the flexibility to test using standard film applicators (filmographs) or spiral bar coaters by using the combined attachment.

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

Technical Specification

Part Number	Test Chart Clip	Standard Table	Perforated Vacuum Table[1]	Double Channel Vacuum Table[1]	Electrically Heated Ambient to 200°C (Ambient to 392°F)	Certificate
K4340M10-	■	■				○
K4340M12-[2]	■	■			■	○
K4340M100	■		■			○
K4340M102	■			■		○
K4340M120[2]	■		■		■	○

Dimensions	780 x 490 x 320mm (30.7 x 19.3 x 12.6”)		
Table Dimensions[3]	600 x 305mm (23.6 x 12”)[4] / 521.75 x 305mm (20.5 x 12”)	Weight	29kg (64lb)
Packing List	Elcometer 4340 Film Applicator, Combined Film Applicator & Spiral Bar Coater Attachment, 3 x mains leads (UK, EUR & US) and operating instructions		

Motorised Film Applicator Attachments

Models		
M10-, M13-, M100, M101, M102, M130	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*

[1] Vacuum Pump supplied separately (Elcometer 4900, see page 4-6)

[2] For 110V unit, add D to end of part number, e.g. K4340M120D

[3] Excluding run-off tray

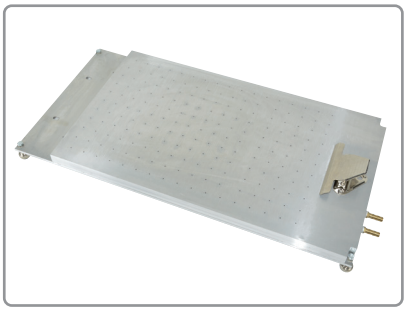
[4] Table dimension size only applies to part numbers K4340M10-

○ Optional Calibration Certificate available.

* Each Spiral Bar Coater Attachment is supplied with a rubber mat

Elcometer 4900

Free Standing Vacuum Tables



Elcometer 4900 free standing vacuum tables provide an ideal surface for manual application of films on test charts or samples. Made of perforated aluminium, the Elcometer 4900 keeps a wide range of test pieces absolutely flat (2.3µm variation over a 100mm length), including glass, plastic sheets, contrast charts, etc., ideal for thicker, more substantial test pieces.

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

Technical Specification

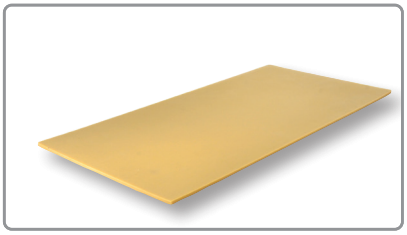
Part Number	Description	Paper Size	Table Dimensions	
			mm	inches
K0004900M001	Perforated Vacuum Table	A4	305 x 225	12 x 8.9
K0004900M002	Perforated Vacuum Table	A3	521.75 x 305	20.5 x 12

Accessories

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 page 4-8 and 4-3.

Technical Specification

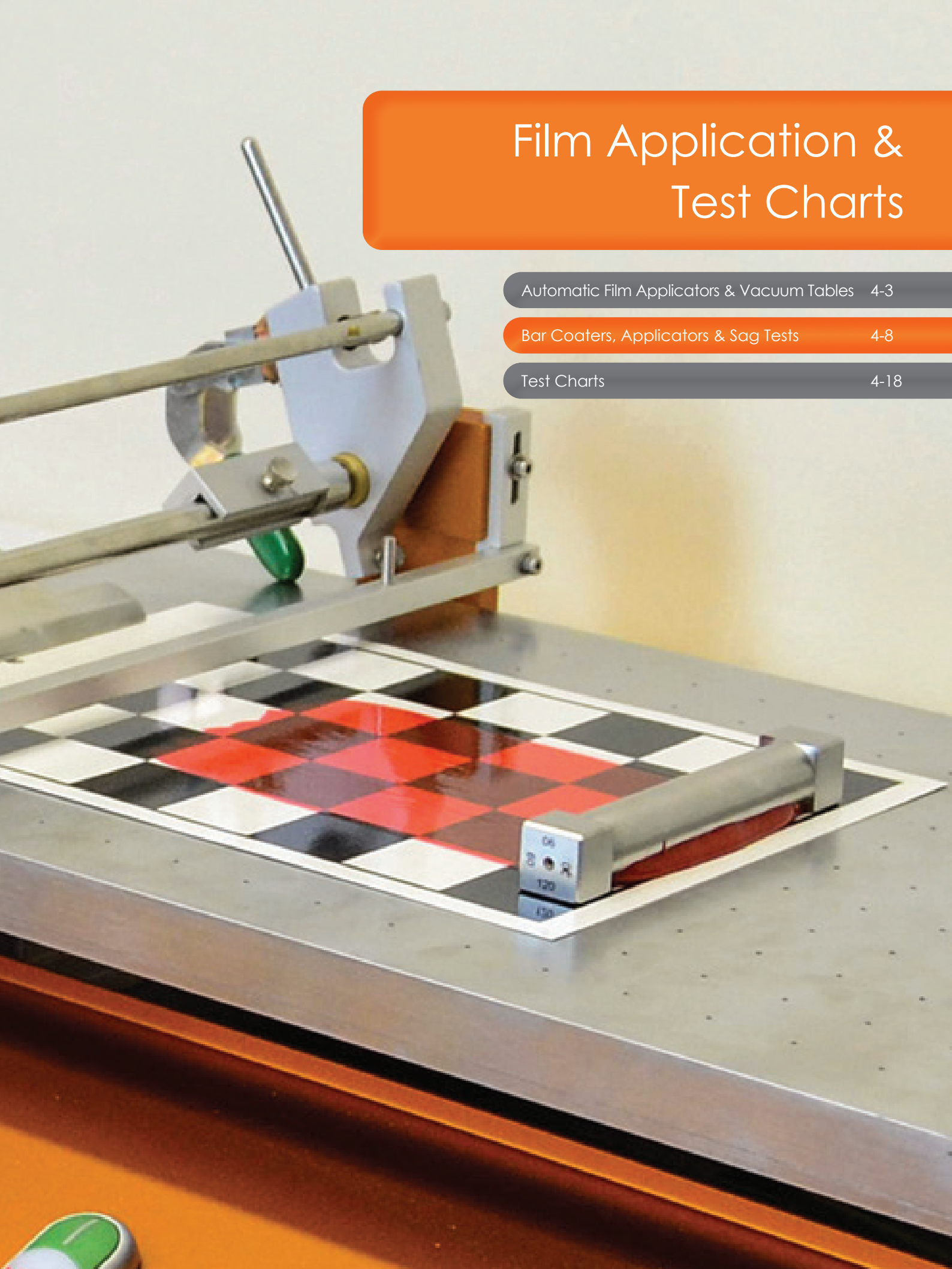
Part Number	Description	Depth		Dimensions	
		mm	inches	mm	inches
KT004350P052	Elcometer 4350/52 Non-Slip Rubber Mat	5	0.2"	510 x 250	20 x 9.8

Film Application & Test Charts

Automatic Film Applicators & Vacuum Tables 4-3

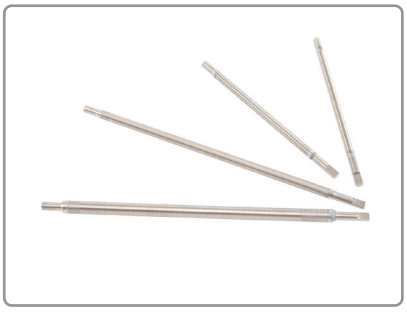
Bar Coaters, Applicators & Sag Tests 4-8

Test Charts 4-18



Elcometer 4361

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 provides a range of measures for coating thicknesses from 4 to 500µm (0.157 to 19.685mils). Other wire diameters are available on request up to a maximum of 500µm (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.

Ideal for use with the Elcometer 4340 Motorised Film Applicators; see page 4-3.
A range of standard and heated vacuum tables are available; see page 4-5 for more information.

STANDARDS:
ASTM D 4147

etv video available elcometer.tv

Technical Specification

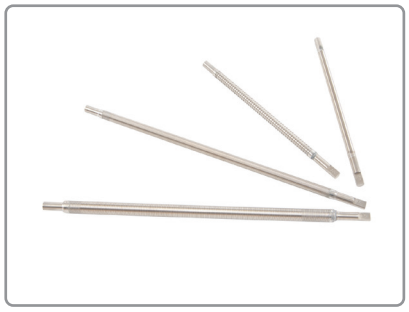
Bar Width 140mm (5.5”)		Coating Thickness				Coating Thickness	
Part Number	Model	µm	mils	Part Number	Model	µm	mils
K0004361P001	Elcometer 4361/1	4	0.157	K0004361P014	Elcometer 4361/14	50	1.968
K0004361P002	Elcometer 4361/2	6	0.236	K0004361P020	Elcometer 4361/20	80	3.149
K0004361P003	Elcometer 4361/3	8	0.315	K0004361P021	Elcometer 4361/21	90	3.543
K0004361P004	Elcometer 4361/4	10	0.393	K0004361P022	Elcometer 4361/22	100	3.937
K0004361P005	Elcometer 4361/5	12	0.472	K0004361P023	Elcometer 4361/23	110	4.330
K0004361P006	Elcometer 4361/6	16	0.630	K0004361P024	Elcometer 4361/24	120	4.724
K0004361P007	Elcometer 4361/7	20	0.787	K0004361P027	Elcometer 4361/27	150	5.905
K0004361P008	Elcometer 4361/8	26	1.024	K0004361P029	Elcometer 4361/29	175	6.890
K0004361P009	Elcometer 4361/9	30	1.181	K0004361P030	Elcometer 4361/30	200	7.874
K0004361P010	Elcometer 4361/10	34	1.338	K0004361P031	Elcometer 4361/31	300	11.811
K0004361P012	Elcometer 4361/12	40	1.574	K0004361P033	Elcometer 4361/33	500	19.685
K0004361P013	Elcometer 4361/13	46	1.811				



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

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 provides a range of measures for coating thicknesses from 4 to 500µm (0.157 to 19.685mils). Other wire diameters are available on request up to a maximum of 500µm (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.

Ideal for use with the Elcometer 4340 Motorised Film Applicators; see page 4-3.
A range of standard and heated vacuum tables are available; see page 4-5 for more information.

STANDARDS:
ASTM D 4147

etv video available elcometer.tv

Technical Specification

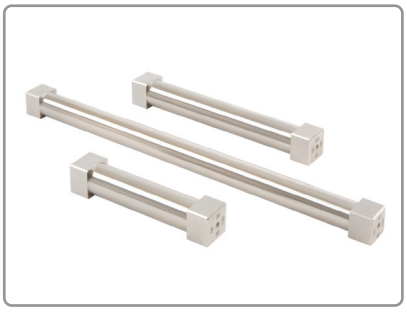
Bar Width 250mm (9.8”)		Coating Thickness				Coating Thickness	
Part Number	Model	µm	mils	Part Number	Model	µm	mils
K0004360P001	Elcometer 4360/1	4	0.157	K0004360P016	Elcometer 4360/16	60	2.362
K0004360P002	Elcometer 4360/2	6	0.236	K0004360P018	Elcometer 4360/18	70	2.755
K0004360P003	Elcometer 4360/3	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	K0004360P024	Elcometer 4360/24	120	4.724
K0004360P008	Elcometer 4360/8	26	1.024	K0004360P025	Elcometer 4360/25	130	5.118
K0004360P009	Elcometer 4360/9	30	1.181	K0004360P027	Elcometer 4360/27	150	5.905
K0004360P010	Elcometer 4360/10	34	1.338	K0004360P030	Elcometer 4360/30	200	7.874
K0004360P011	Elcometer 4360/11	38	1.496	K0004360P031	Elcometer 4360/31	300	11.811
K0004360P012	Elcometer 4360/12	40	1.574	K0004360P032	Elcometer 4360/32	400	15.748
K0004360P014	Elcometer 4360/14	50	1.968	K0004360P033	Elcometer 4360/33	500	19.685

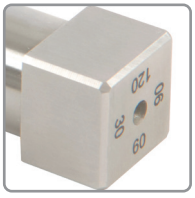


Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

Elcometer 3520

Baker Film Applicator







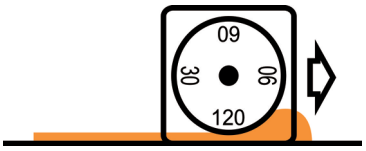
STANDARDS:
ASTM D 823-E

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 page 4-3.

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.

etv video available elcometer.tv



Elcometer 3520

Technical Specification

Part Number	Model	Film Thickness				Film Width*
Metric		µm				mm
K0003520M001	Elcometer 3520/1	30,	60,	90,	120	25
K0003520M002	Elcometer 3520/2	30,	60,	90,	120	50
K0003520M003	Elcometer 3520/3	30,	60,	90,	120	60
K0003520M101	Elcometer 3520/101	50,	100,	150,	200	60
K0003520M004	Elcometer 3520/4	30,	60,	90,	120	75
K0003520M005	Elcometer 3520/5	30,	60,	90,	120	100
K0003520M006	Elcometer 3520/6	30,	60,	90,	120	125
K0003520M007	Elcometer 3520/7	30,	60,	90,	120	150
K0003520M009	Elcometer 3520/9	30,	60,	90,	120	250



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

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

Elcometer 3525 & 3530

Adjustable Baker Film Applicators



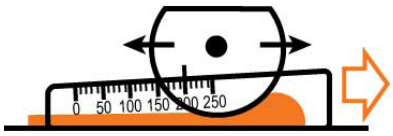




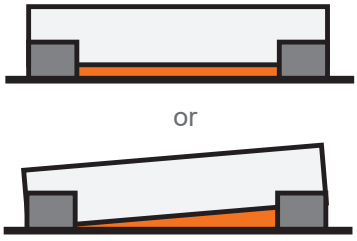
STANDARDS:
ASTM D 823-E

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 page 4-3.



Elcometer 3530



Technical Specification

Part Number	Model	Film Thickness		Film Width*	
Metric		µm	mils	mm	inches
K0003525M001	Elcometer 3525/1	0 - 100	-	50	-
K0003525M002	Elcometer 3525/2	0 - 100	-	75	-
K0003525M003	Elcometer 3525/3	0 - 100	-	100	-
K0003525M004	Elcometer 3525/4	0 - 100	-	150	-
K0003525M005	Elcometer 3525/5	0 - 100	-	200	-
K0003525M006	Elcometer 3525/6	0 - 100	-	250	-
K0003530M001	Elcometer 3530/1	0 - 250	0 - 10	50	2
K0003530M002	Elcometer 3530/2	0 - 250	0 - 10	75	3
K0003530M003	Elcometer 3530/3	0 - 250	0 - 10	100	4
K0003530M004	Elcometer 3530/4	0 - 250	0 - 10	150	6
K0003530M005	Elcometer 3530/5	0 - 250	0 - 10	200	8
K0003530M006	Elcometer 3530/6	0 - 250	0 - 10	250	10

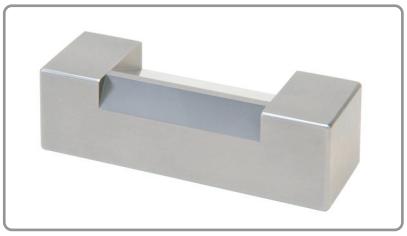


Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

* Add 30mm (1.2”) to the Film Width to calculate the total width of the applicator

Elcometer 3550

Single Sided Film Applicators



The Elcometer 3550 Single Sided Film Applicators are easy to clean gauges manufactured to the highest accuracy. These precision ground stainless steel Single Sided Film Applicators have a flat edged prismatic body making them suitable for coatings applied to a flat and relatively strong substrate.

The Elcometer 3550 Single Sided Film Applicators can be used with the Elcometer 4340 Motorised Film Applicators, see page 4-3.

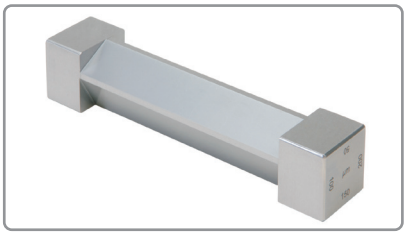
STANDARDS:
ASTM D 823-E

Technical Specification

Part Number	Model	Film Thickness		Film Width+	
Metric		µm	mils	mm	inches
K0003550M001	Elcometer 3550/1	50	2	50	2
K0003550M003	Elcometer 3550/3	50	2	150	6
K0003550M201	Elcometer 3550/1	75	3	50	2
K0003550M203	Elcometer 3550/3	75	3	150	6

Elcometer 3540

Four Sided Film Applicators



The Elcometer 3540 Four Sided Film Applicators are easy to clean gauges manufactured to the highest accuracy. These precision ground stainless steel Four Sided Film Applicators have 4 thicknesses per applicator each with a flat edged prismatic body making them suitable for coatings applied to a flat and relatively strong substrate.

Available in a range of film widths and can be used with the Elcometer 4340 Motorised Film Applicators, see page 4-3.

STANDARDS:
ASTM D 823-E

Technical Specification

Part Number	Model	Film Thickness		Film Width*	
Metric		µm	mils	mm	inches
K0003540M001	Elcometer 3540/1	50, 100, 150, 200	2, 4, 6, 8	50	2
K0003540M002	Elcometer 3540/2	50, 100, 150, 200	2, 4, 6, 8	75	3
K0003540M003	Elcometer 3540/3	50, 100, 150, 200	2, 4, 6, 8	100	4
K0003540M004	Elcometer 3540/4	50, 100, 150, 200	2, 4, 6, 8	150	6
K0003540M005	Elcometer 3540/5	50, 100, 150, 200	2, 4, 6, 8	200	8
K0003540M006	Elcometer 3540/6	50, 100, 150, 200	2, 4, 6, 8	250	10



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

* Add 40mm (1.6”) to the Film Width to calculate the total width of the applicator

Elcometer 3570

Micrometric Film Applicators







STANDARDS:
ASTM D 823-E

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

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



Elcometer 3570

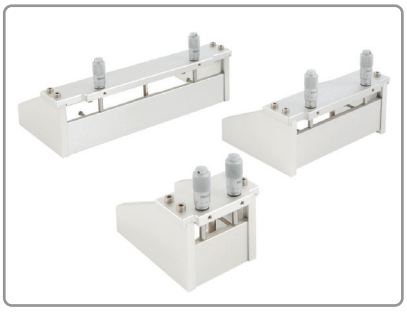
Technical Specification

Part Number	Model	Film Thickness	Film Width*	
		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

Elcometer 3580

Casting Knife Film Applicators





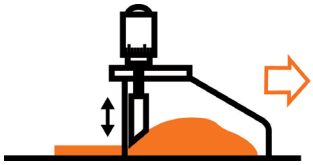


STANDARDS:
ASTM D 823-E

The Elcometer 3580 Casting Knife Film Applicators are the ideal gauge for the laboratory, available in a wide range of film widths and have extended sides to confine the coating during the application.

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

Technical Specification

Part Number	Model	Film Thickness	Film Width*	
		µm	mm	inches
K0003580M201	Elcometer 3580/1 Casting Knife Film Applicator	0 - 5000	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

Elcometer 3505

Cube Film Applicator



The Elcometer 3505 Cube Film Applicator is manufactured from hardened stainless steel, this allows you to apply a single 12mm (0.5” wide) film stripe accurately.

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, ASTM D 1640−03

Technical Specification

Part Number	Model	Film Thickness		Film Width[1]		Number of
Metric		µm	mils	mm	inches	Stripes
K0003505M001	Elcometer 3505/1	30 - 1000	1 - 40	12	0.50	1

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 Reservoirs



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 page 13-3) or for comparing two coatings simultaneously.

STANDARDS:
ASTM D 823-E (Elcometer 3560)

Technical Specification

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

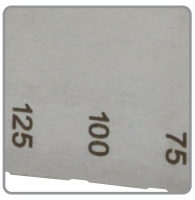
[1] Elcometer 3505/1 total width: 26mm (1.0”)
[2] Elcometer 3560 total width: 90mm (3.5”); Elcometer 3508 total width: 165mm (6.5”)

Elcometer 4270

Sag Tester



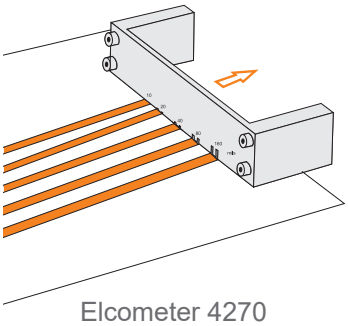




STANDARDS:
ASTM D 4400, FTMS 141 4494.1

Made from stainless steel, the straight scraper has 11 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

Technical Specification

Part Number Metric	Description*	Range µm	Range mils	Notch Depth µm	Notch Depth mils
K0004270M001	Elcometer 4270/1	75 - 300	3 - 12	75, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300	3, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
K0004270M203	Elcometer 4270/3	350 - 1500	14 - 60	350, 400, 450, 500, 620, 750, 875, 1000, 1125, 1250, 1500	14, 16, 18, 20, 25, 30, 35, 40, 45, 50, 60
K0004270M204	Elcometer 4270/4	100 - 600	4 - 24	100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

* Elcometer 4270 total width: 127mm (5")

Film Application & Test Charts

Automatic Film Applicators & Vacuum Tables 4-3

Bar Coaters, Applicators & Sag Tests 4-8

Test Charts 4-18



Elcometer 4695

Leneta Test Charts



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 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-fluorescent 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.

etv video available elcometer.tv

Elcometer 4695

Opacity Charts



Form 2A



Form 2C



Form 3B



Form 5C

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.

Technical Specification

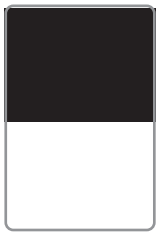
Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M003	K0004695M203	Leneta Chart 2A	140 x 254	5½ x 10	2.72kg (6lb)	250	6
K0004695M004	-	Leneta Chart 2C	194 x 260	7⅝ x 10¼	4.08kg (9lb)	250	4
K0004695M006	K0004695M206	Leneta Chart 3B	194 x 289	7⅝ x 11⅜	4.08kg (9lb)	250	4
K0004695M015	K0004695M215	Leneta Chart 5C	194 x 260	7⅝ x 10¼	4.08kg (9lb)	250	4



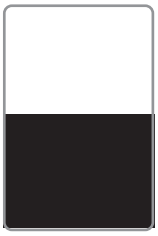
Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

Elcometer 4695

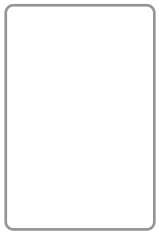
Brushout Cards



Form 2DX



Form 5DX



Form WDX

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).

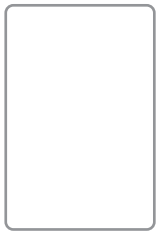
Brushout Cards are also used widely for drawdowns and colourimetric measurements.

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	3⅞ x 6	3.18kg (7lb)	500	4
K0004695M016	K0004695M216	Leneta Chart 5DX	98 x 152	3⅞ x 6	3.18kg (7lb)	500	4
K0004695M102	K0004695M302	Leneta Chart WDX	98 x 152	3⅞ x 6	3.18kg (7lb)	500	4

Elcometer 4695

Duplex Applicator Charts



Form WF

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.

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M103	-	Leneta Chart WF	76 x 184	3 x 7¼	2.27kg (5lb)	500	-



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

Elcometer 4695

Display Charts/Spreading Rate

Display Chart



Form 8B

Spreading Rate Chart



Form 8H

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 metres (approximately one square foot) in area, and are used in brushout hiding tests at specified spreading rates as described in ASTM Method D 344.

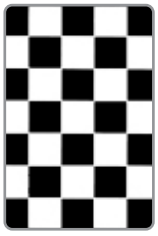
Technical Specification

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	7⅝ x 11⅜	4.08kg (9lb)	250	4
K0004695M023	-	Leneta Chart 8H	286 x 438	11¼ x 17¼	5kg (11lb)	125	-

Elcometer 4695

Checkerboard Charts

Display Chart



Form 10B

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 are typically used in drawdown hiding tests.

Technical Specification

Part Number		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
K0004695M030	-	Leneta Chart 10B	194 x 289	7⅝ x 11⅜	4.08kg (9lb)	250	4



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

Elcometer 4695 Plain White Charts

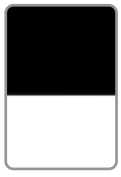


These are available in varying thicknesses and size. The Leneta WDX card comes with a convenience hole at the top.

Technical Specification

Part Number Box	Case	Description	Chart Dimensions mm	Chart Dimensions inches	Box Weight	Quantity per Box	Boxes per Case
Card thickness 0.5mm							
K0004695M102	K0004695M302	Leneta Chart WDX	98 x 152	3⅞ x 6	3.18kg (7lb)	500	4
Card thickness 0.3mm							
K0004695M103	-	Leneta Chart WF	76 x 184	3 x 7¼	2.27kg (5lb)	500	6

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

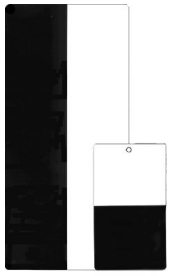
Part Number Box	Case	Description	Chart Dimensions mm	Chart Dimensions inches	Box Weight	Quantity per Box	Boxes per Case
K0004695M064	K0004695M264	Leneta Chart N2A	140 x 254	5½ x 10	2.72kg (6lb)	250	6



Can be used with the Elcometer 4340 Motorised Film Applicator, see pages 4-3

Elcometer 4695

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.

Black surface:
Solvent Resistant, Non bleeding, Reflective
- 1% maximum, measured according to ASTM Method E1347

White surface:
Solvent Resistant, Colour Retentive, Reflective, Reflectance
- 80% minimum, measured according to ASTM Method E1347

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

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		Description	Chart Dimensions		Box Weight	Quantity per Box	Boxes per Case
Box	Case		mm	inches			
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 4-3

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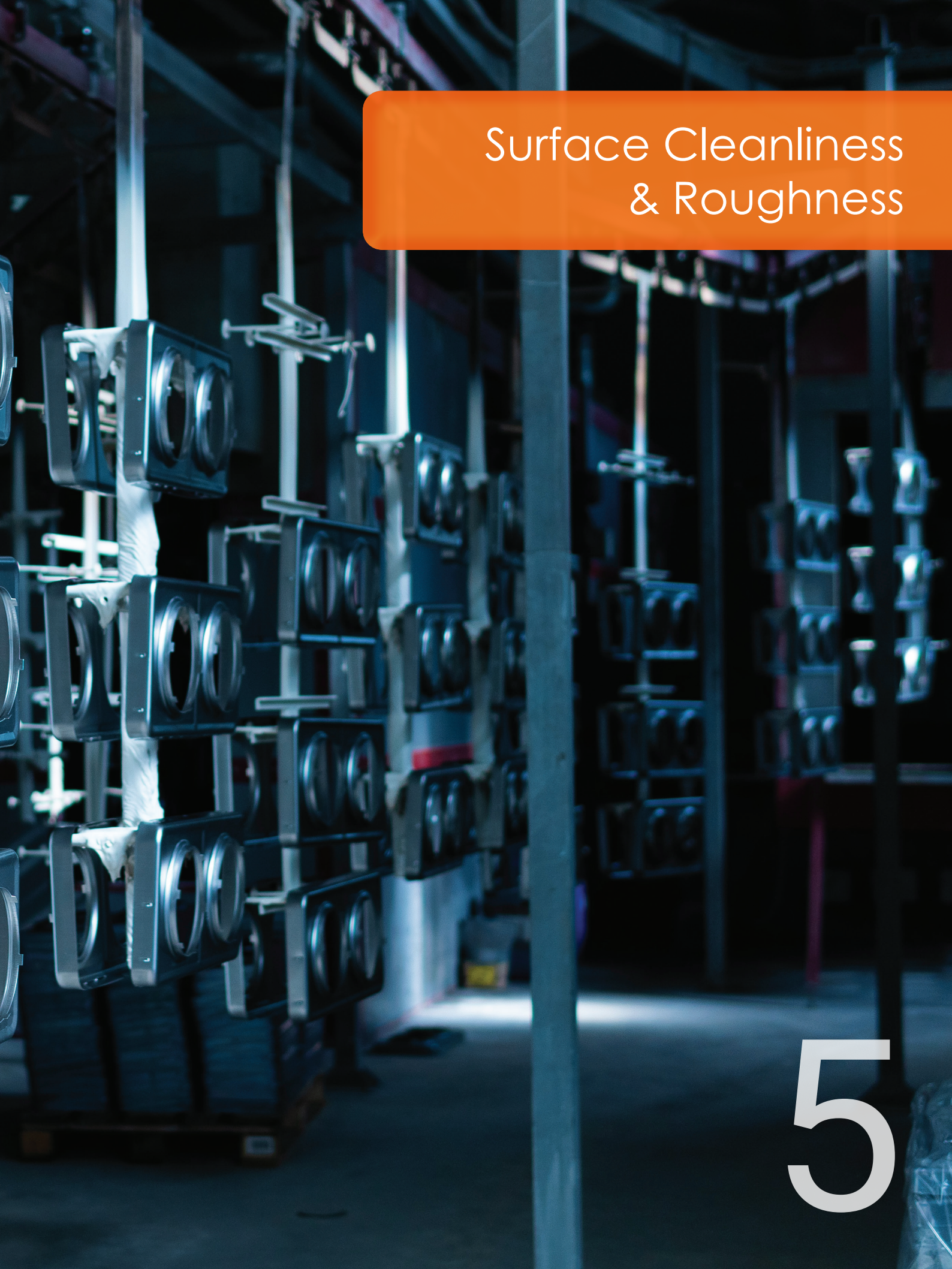
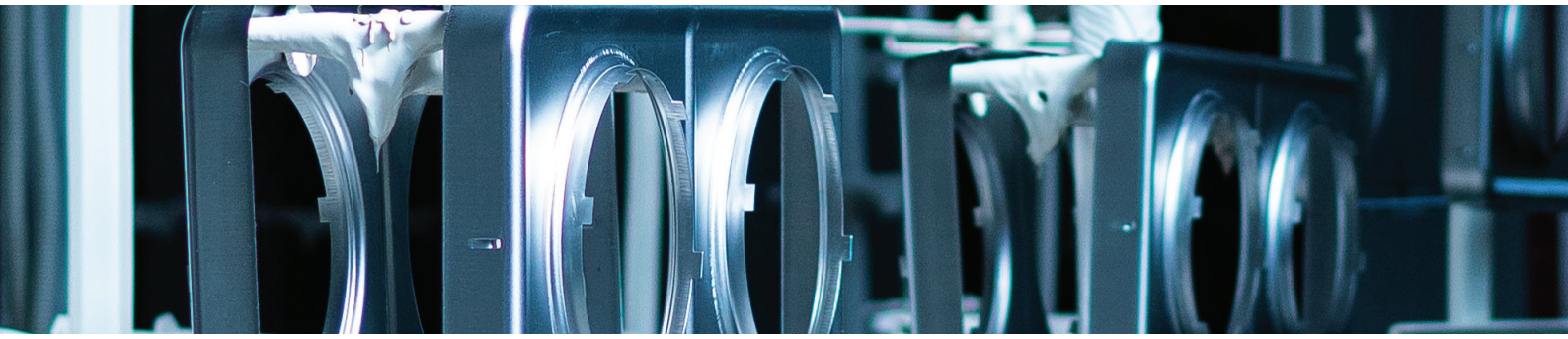


Surface Cleanliness & Roughness

5



Surface preparation is one of the most important factors in the successful application of a coating 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, these include;

Surface Cleanliness: soluble salts & ion specific contamination (sulphates, chlorides, nitrates, etc.) which are often invisible to the eye) 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.

Surface Roughness: these consist of a stylus attached to an arm which moves over the surface to record and measure the roughness over a specified distance, recording peak-to-valley average.

Elcometer 138/2

Surface Contamination Kit



STANDARDS:
AS 3894.6-A, AS 3894.6-D,
SSPC Guide 15

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 re-coating 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

Technical Specification

Part Number	Description		Certificate
E138----2	Elcometer 138/2 Surface Contamination Kit		●
Measuring Range	Iron: 3,10, 25, 50, 100, 250, 500mg/l Fe^2 Chloride: 30 - 600µg/cm^2 (30 - 600ppm) Cl	pH: 0pH to 14pH	
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 Elcometer 135C Bresle test patches, 3 x 5ml (0.17fl oz) syringes, 3 x needles, 30ml (1fl oz) plastic beaker, carry case and operating instructions		

Accessories

E135----C25	Elcometer 135C Bresle Test Patch (Pack of 25)	T13827259	Pure Distilled Water, 250ml (8.5fl oz) Bottle
E135----C100	Elcometer 135C Bresle Test Patch (Box of 100)	T13820562	100 x pH Test Strips
T13818517	3 x 5ml (0.17fl oz) Syringes	T13820563	100 x Iron Test Strips
T13818518	3 x Needles	T13820564	40 x Chloride Test Strips
T13818519	Plastic Beaker, 30ml (1fl oz)		

Elcometer 138/2

pH Test Strips



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

These strips will determine if a solution or surface is acid or alkaline in nature. The strips can be dipped into a solution washed from the surface or by putting a wet strip on to the dry surface. pH does not measure the concentration but it does indicate how acidic or alkaline the surface is.

Technical Specification

Part Number	Description
T13820562	100 x pH Test Strips

● Certificate of Cleanliness & Test Area available at www.elcometer.com/cert

Elcometer 148

pH Tester







STANDARDS:
ASTM E 70

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

This simple, easy to use instrument measures both pH and temperature using a single sensor.

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

- 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

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.

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 AAA batteries	
Calibration	3 point at 7pH, 4pH and 10.01pH	
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 (3.38 fl oz) Bottle
T14821767-2	7pH Buffer Solution for Calibration: 100ml (3.38 fl oz) Bottle
T14821767-3	10.01pH Buffer Solution for Calibration: 100ml (3.38 fl oz) Bottle

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's sensor directly into the solution under test.

The Elcometer 138 Conductivity Meter includes a convenient salinity conversion indicator.

Features:

- Highly precise measurements can be obtained from a single drop
- Automatic range switching gives a wide measurement range of 1µs/cm to 19.99mS/cm
- Out of range and low battery alarms
- Visual indication when ambient temperature is outside the operating range

Technical Specification

Part Number	Description
E138-CM	Elcometer 138 Conductivity Meter
Measurement Principle	2 Electrode Bipolar AC
Measurement Mode	Conductivity, Temperature
Minimum Sample Volume	0.12ml
Measuring Range	0 - 19.99mS/cm
Resolution	0 - 1999µS/cm: 1µS/cm 2.00 - 19.99mS/cm: 0.01mS/cm
Accuracy	±2% full scale (for each range)
Operating Temperature	5°C to 40°C (41°F to 104°F)
Operating Humidity	85% or less relative humidity (no condensation)
Battery Type	2 x CR2032 lithium batteries
Battery Life	approx. 200 hours of continuous use without backlight
Weight	50g (1.76oz) - including sensor and batteries
Dimensions	164 x 29 x 20mm (6.5 x 1.1 x 0.79")
Packing List	Elcometer 138 Conductivity Meter, 14ml (0.5fl oz) bottle of conditioning solution, 14ml (0.5fl oz) bottle of standard 1413µS/cm calibration solution, 2 x CR2032 lithium batteries and operating instructions

Accessories

T13830628	Replacement Conductivity Sensor
T13830629-2	Standard 1413µS/cm Calibration Solution, 250ml (8.45fl oz) Bottle

Elcometer 142

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.

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 to 5 with descriptions for accurate class placement
Dimensions	210 x 297mm (8.27 x 11.69”) Weight 250g (9oz)
Packing List	Microscope with 10 x 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
T9999358-1	Adhesive Tape (1 roll) ISO 8502-3
T9999358-2	Adhesive Tape (2 rolls) ISO 8502-3
T14219525	Dust Assessment Plate

Elcometer 145

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.

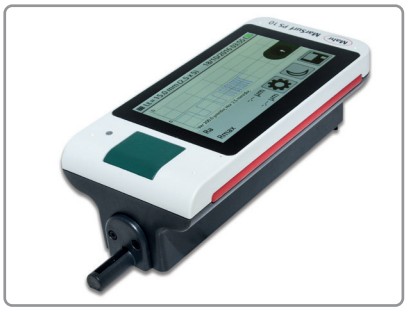
The Dust Tape Roller presses the Elcometer 142 Dust Tape to the surface using a controlled constant force as required by BS EN ISO 8502-3 (BS 7079-B3:1993).

Technical Specification

Part Number	Description
E145----1	Elcometer 145 Dust Tape Roller
Load Exerted	39.2 to 49.0 N, (8.8 to 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 7062

MarSurf PS10 Surface Roughness Tester







STANDARDS:
ASTM D7127, ASME B46, DIN 4768, EN 10049, ISO 4287, ISO 4287/1, JIS B 0601, SSPC PA 17

The Elcometer 7062 is a lightweight 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.

With 31 surface parameter settings available the Elcometer 7062 surface roughness tester can display all parameters that comply to National & International Standards. 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

Technical Specification

Part Number	Description	Certificate
K7062M001	Elcometer 7062 MarSurf PS10 Surface Roughness Tester	●
Unit of Measurement	Metric, Imperial	
Stylus pick-up*	Inductive skidded stylus pick-up, 2µm (80µin) stylus tip, measuring force approx. 0.7mN	
Parameters	DIN/ISO - Ra, Rq, Rz, Rmax, Rp, Rpk, Rk, Rvk, Mr1, Mr2, A1, A2, Vo, Rt, R3z, RPc, Rmr, RSm, Rsk, CR, CF, CL, R, AR, Rx JIS - Ra, Rq, Ry, RzJIS, tp, RSm, S ASME - Rp, Rpm, RPc, Rsk, tp MOTIF - R, AR, Rx, CR, CF, CL	
Measuring Range	0-350µm (0-13.78mils) Resolution 8nm (0.315µin)	
Filter	Phase-correct profile filter (Gaussian filter) according to DIN EN ISO 16610-21 (formerly ISO 11562), special filter according to DIN EN ISO 13565-1, Is filter according to DIN EN ISO 3274 (can be switched off)	
Cutoff (lc)	0.25mm, 0.8mm, 2.5mm; automatic (0.010”, 0.030”, 0.100”)	
Traversing Length (Lt)	1.5mm, 4.8mm, 15mm; automatic (0.06”, 0.192”, 0.6”)	
Traversing Length (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 16	
Memory Capacity	3,900 profiles, 500,000 results	
Battery	Rechargeable battery 100V to 264V power supply	
Dimensions	160mm × 77mm × 50mm (6.29” × 3.03” × 1.97”) Weight 500g (1.10lb)	
Packing List	Elcometer 7062 MarSurf PS10 base unit, drive unit, drive unit extension cable, 1 x standard stylus pick-up, built-in battery, roughness standard integrated into casing, height adjustment accessory, stylus pick-up protection, universal charger / mains adaptor, USB cable, carry case with shoulder strap and belt loop, calibration certificate and operating instructions	

● Calibration Certificate supplied as standard.

* Other stylus pick-ups are available

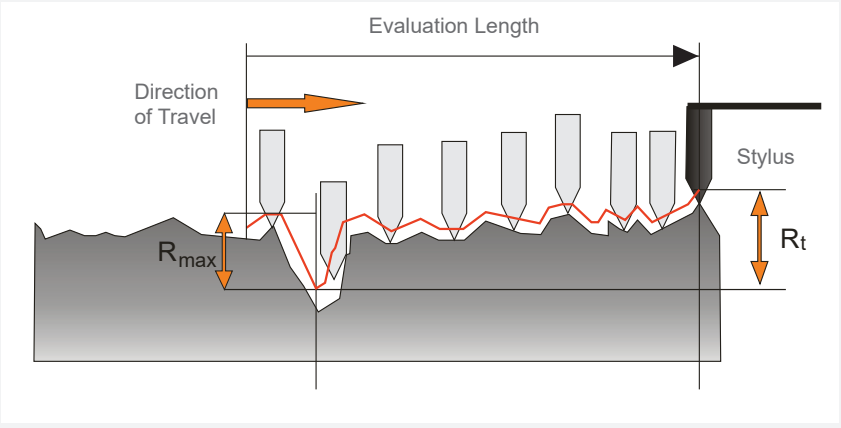
Elcometer 7062 MarSurf PS10 Surface Roughness Tester

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 7062 to the measuring stand
KT007061P011	End Face Vee-Block - For measuring on flat faces of cylindrical and planar components
KT007061P013	Adaptor Set for Transverse Tracing; Comprising of Adaptor for Transverse Tracing and Vee-Block Holder with Vee-Block - For hand-held transverse tracing of cylindrical measuring objects

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 pre-defined sample lengths.



The measurement technique provides a number of measurement parameters including:

- **Rmax:** The largest difference between peaks & valleys in an individual sampling length within the overall evaluation length
- **Ra:** The average roughness over the sampling length
- **Rt:** The distance between the highest peak and lowest valley over the evaluation length
- **Rz:** The average distance between the highest peak and lowest valley over a number of sampling lengths

elcometer®



Everything you need for fast and accurate **coating inspection** in one **cost-effective, easy-to-use kit.**

See page 10-3


elcometer®



Permeability & 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.

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.

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

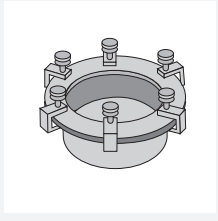
Technical Specification

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				

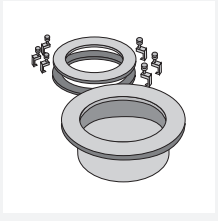
Accessories

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

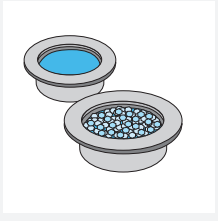
How to use Payne Permeability Cups



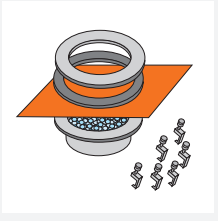
Prepare the film to be tested using a film applicator and suitable test chart.



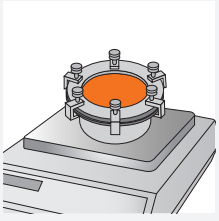
Disassemble the permeability cup.



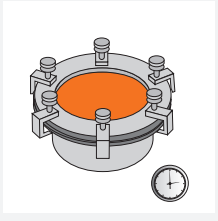
Fill with required liquid (typically water) or dry desiccant (absorbent).



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 the appropriate time, re-weigh, calculate the change in mass (Δm) & water vapour transmission rate.



For use with Elcometer 8720 compact balance, see page 1-7


elcometer®



Coating Thickness

Wet Film & Powder Thickness 7-2

Dry Film Thickness 7-13

7

elcometer®



Coating Thickness

Wet Film & Powder Thickness 7-2

Dry Film Thickness 7-13

7

elcometer®

Wet Film & Powder 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 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.

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.

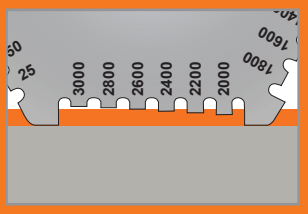
The cured dry film thickness is determined by the level of shrinkage, which in turn is influenced by factors such as particle size and density of the uncured powder.

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.

Using a Wet Film Comb

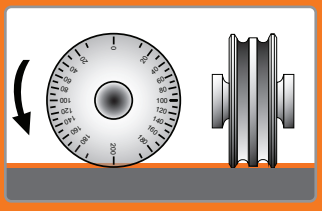
Place a comb perpendicular to and touching the substrate. Hold the comb in position and wait a few seconds until the teeth are wet. Remove the comb from the film.



The wet film thickness lies between the highest value 'coated' or 'wet' tooth and the highest value 'uncoated' or 'dry' tooth.

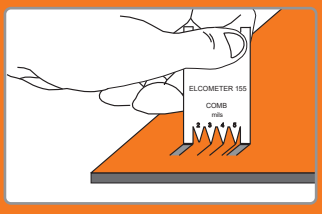
Using a Wet Film Wheel

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.



Using 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 highest value where a drag mark is not.

Elcometer 112 & 3236

Hexagonal Wet Film Combs (Stainless Steel)



These hexagonal precision formed stainless steel wet film combs are long lasting, reusable and supplied in a range of thicknesses measuring up to 3,000µm (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

etv video available elcometer.tv

Technical Specification

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 - 2,000µm	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, 1,000, 1,100, 1,200, 1,300, 1,400, 1,500, 1,600, 1,700, 1,800, 1,900, 2,000µm	○
B112----1B	25 - 3,000µm	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 1,000, 1,100, 1,200, 1,400, 1,600, 1,800, 2,000, 2,200, 2,400, 2,600, 2,800, 3,000µm	○
K0US3236M203	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	○
K0US3236M204	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 3236 M201 / M203	53 x 50 x 1mm (2.09 x 1.97 x 0.04”), 10g (0.35oz)	
	Elcometer 3236 M202 / 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		

○ Optional Calibration Certificate available.

Elcometer 115

Wet Film Combs (Stainless Steel)



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

These reusable precision stainless steel combs are made to be long lasting and are supplied with either Metric or Imperial measurements.

Four separate thickness ranges are available up to a maximum of 1,250µm or 50mils and are manufactured to an accuracy of ±5% of marked value or ±3µm (0.12mil), whichever is greater.

Each comb has 10 measurement steps (teeth).

etv video available elcometer.tv

Technical Specification

Metric Combs				Imperial Combs			
Part Number	Range	Measurement Steps	Certificate	Part Number	Range	Measurement Steps	Certificate
B11529455M	20 - 325µm	20, 35, 50, 75, 100, 125, 175, 225, 275, 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 - 1,250µm	125, 250, 375, 500, 625, 750, 875, 1,000, 1125, 1,250µm	○	B11529454E	5 - 50mils	5, 10, 15, 20, 25, 30, 35, 40, 45, 50mils	○
B1152959WM	-	Set of 4 Combs	○	B1152959WE	-	Set of 4 Combs	○

* Two 10mil values, one on each edge of the comb

Elcometer 3238

Long Edge Wet Film Combs (Stainless Steel)



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

These stainless steel combs are wire eroded to provide an accuracy ±5% of marked value or ±3µm (0.12mil), whichever is greater, and are supplied with either Metric or Imperial measurements.

Each comb has 24 measurement steps (teeth) providing a more accurate wet film thickness value.

etv video available elcometer.tv

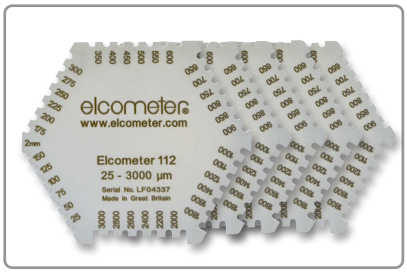
Technical Specification

Metric Combs				Imperial Combs			
Part Number	Range	Measurement Steps	Certificate	Part Number	Range	Measurement Steps	Certificate
K0003238M201	5 – 120µm	5µm	○	K0US3238M201	0.5 – 6mils	0.5mil	○
K0003238M202	25 – 600µm	25µm	○	K0US3238M202	1.0 – 24mils	1.0mil	○
K0003238M203	50 – 1,200µm	50µm	○	K0US3238M203	2.0 – 48mils	2.0mil	○
K0003238M204	-	Set of 3 Combs	○	K0US3238M204	-	Set of 3 Combs	○

○ Optional Calibration Certificate available.

Elcometer 112AL

Punched Wet Film Combs (Aluminium)



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 - 3,000µm) on one side and Imperial (1 - 118mils) on the other.

The Elcometer 112AL can be customised with your logo. Please contact Elcometer for further details.

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

etv video available elcometer.tv

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		

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

etv video available elcometer.tv

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

Elcometer 3230

Wet Film Wheels







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

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”) or 50cm (19”); please order separately.

When the volume to solids ratio of the coating is known (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 1,000µm (0 to 1mil and 0 to 40mils) are available.

- Continuous scale produces measurement accuracy of ±5% of marked value or ±3µm (0.12mil), whichever is greater
- Suitable for flat and curved surfaces

etv video available elcometer.tv

Technical Specification

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 - 1,000µm	50.0µm	○	K0US3230M007	0 - 40mils	2.0mils	○
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

○ Optional Calibration Certificate available.

Elcometer 3230

Coil Coating Wet Film Wheels





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

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.

When the volume to solids ratio of the coating is known (found on the product data sheet supplied by the manufacturer), the wet film thickness can be used to predict the dry film thickness.

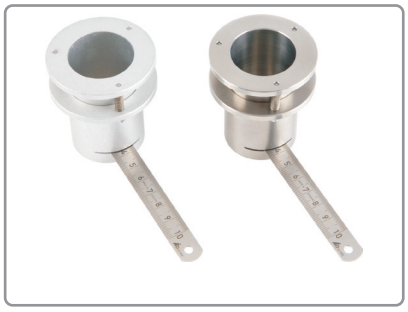
Technical Specification

Part Number	Metric			Imperial			
	Range	Graduations	Certificate	Part Number	Range	Graduations	Certificate
K0003230M017	0 - 50µm	2.5µm	○	K0US3230M017	0 - 2mils	0.1mils	○
K0003230M018	0 - 100µm	5.0µm	○	K0US3230M018	0 - 4mils	0.2mils	○
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						

○ Optional Calibration Certificate available.

Elcometer 3233

Pfund Thickness Gauge







STANDARDS:
ASTM D 1212-B, NF T30-125

Available in aluminium or stainless steel this instrument consists of two concentric cylinders, one sliding inside the other. A spherical glass lens is fitted to the end of the central cylinder and when pressed into the wet film, leaves a circular trace.

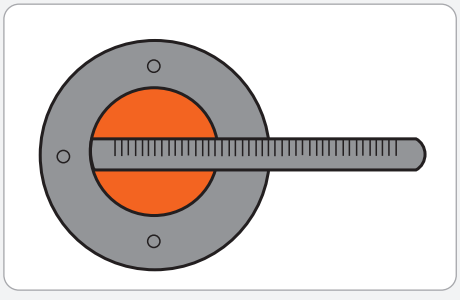
The diameter of the mark on the lens is measured and, using the supplied conversion table, the thickness of the coating can be easily assessed.

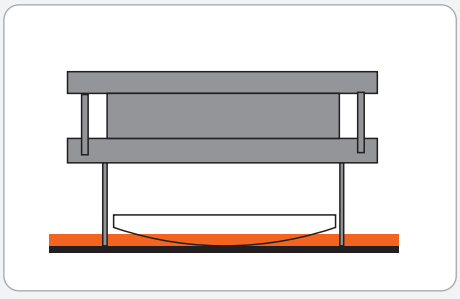
- Ideal for measuring the thickness of wet translucent products such as varnishes, oils, etc.
- Measurement range of 2.25 - 360µm (0.09 - 14.17mils)

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	195g (6.88oz)
Packing List	Pfund Thickness Gauge, stainless steel rule, conversion table, storage case and operating instructions		

How to use a Pfund Thickness Gauge



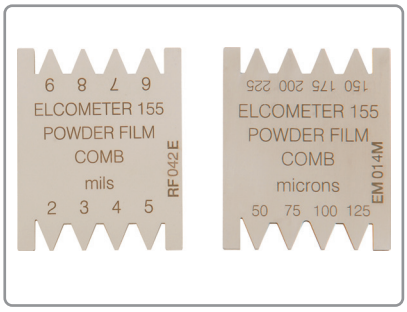


1. As soon as possible after the coating has been applied, place the gauge on to the surface being tested.
2. Press down firmly on the top flange of the gauge to force the lens into the wet film.
3. Release pressure on the top flange and then remove the gauge from the surface.
4. Use the steel rule to measure to the nearest millimetre the diameter of the paint spot on the lens.
5. Look up the film thickness using the table in paragraph 3, or calculate film thickness using the following formula where D is the diameter of the paint spot and all measurements are in millimetres:

$$\textit{Film Thickness} = \frac{D^2}{4000}$$

Elcometer 155

Uncured Powder Film Comb



Available in four scale ranges, the Elcometer 155 is designed to measure the 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.

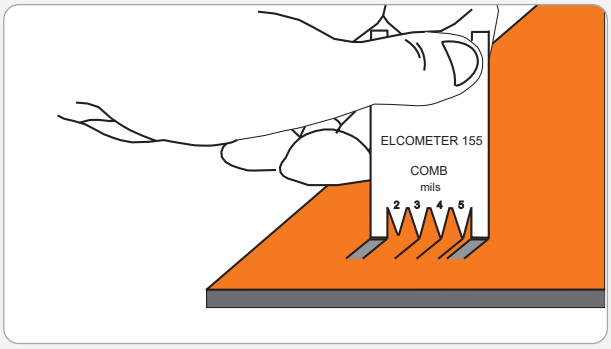
Note: the thickness of a coating prior to cure is not the same value after curing but there is a correlation. The powder comb should be used as a guide only.

STANDARDS:
ASTM D7378-A

Technical Specification

Part Number*	Description	Range	Certificate
B15513573-5	Elcometer 155 Metric Powder Film Comb	50 - 225µm	○
B15513573-6	Elcometer 155 Metric Powder Film Comb	225 - 1250µm	○
B15513573-1	Elcometer 155 Imperial Powder Film Comb	2 - 9mils	○
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 is not.

* The Elcometer 155 is not available for sale in the USA
○ Optional Calibration Certificate available.

elcometer®



Coating Thickness

Wet Film & Powder Thickness 7-2

Dry Film Thickness 7-13

7



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 and its appearance. It also ensures compliance with a host of International Standards.

A 'dry film' is the coating on a surface which has cured as the solvent has evaporated and the coating is dry to touch. The coating is typically a paint, a varnish or a powder. But it can be any substance applied to a substrate. A dry film thickness (DFT) gauge, often referred to as a coating thickness gauge, can be used to measure the thickness of coatings when dry.

Coating Thickness Standards

There are two 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).

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.

Choose the correct Thickness Gauge for your dry film thickness measurement

Elcometer 456 - separate gauge

- Available with a wide range of interchangeable probes; providing greater coating thickness
- See page **7-16**



Elcometer 456 - integral gauge

- Ideal for single handed operation for consistent, repeatable and accurate results
- See page **7-40**



Elcometer 415 - paint & powder

- Provides fast, accurate paint & powder thickness measurements on smooth & thin industrial coated surfaces.
- See page **7-44**



Elcometer 311 - automotive

- Provides an indication of the overall paintwork condition of vehicles.
- See page **7-47**



Elcometer 355 - precision

- Ideal for measuring thin substrates where precision and accuracy is important.
- See page **7-50**



elcometer®

Dry Film Thickness - Digital

Elcometer 456 **Separate Coating Thickness Gauge**

The **Elcometer 456** Coating Thickness Gauge is available with a wide range of interchangeable probes; providing greater coating thickness measurement flexibility on metal substrates.

- Measure coatings up to 31mm (1,220mils) on metal substrates
- Easy to read, user definable display with automatic screen brightness
- Ergonomic design, ideal for continuous use
- Dust and waterproof rugged design equivalent to IP64
- Temperature stable measurements

Measure DFT – Ferrous & Non-Ferrous Substrates – FAST · REPEATABLE · ACCURATE · DURABLE



Bluetooth® wireless technology

compatible with ElcoMaster®

etv video available elcometer.tv

Elcometer 456

Separate Coating Thickness Gauge



Large easy to read measurements in Metric and Imperial units

Fast

Helping you become more efficient

70+ readings per minute and 140+ per minute using the Scan Probe, multiple calibration memories and alphanumeric batch identification.

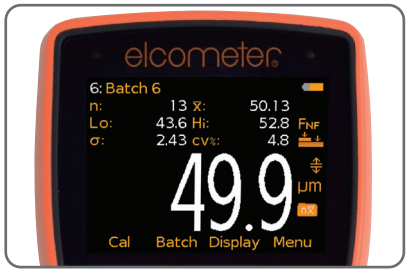


Halve the inspection time using the scan probe

Accurate

Accurate measurements on smooth, rough, thin and curved surfaces

Measures on smooth, rough, thin and curved surfaces to ±3% or 2.5µm in accordance with National & International Standards.



View up to 8 user selectable statistics on screen

Easy

Large buttons and colour screen

LCD screen with auto rotate; factory calibrated with high and low reading limit indicators in multiple languages.



Rugged and reliable, ideal for production lines

Reliable

Designed to last

Heavy duty, impact resistant and supplied with fully traceable test certificates and our 2 year gauge warranty*.

Powerful

Store up to 150,000 readings in up to 2,500 batches

Measures up to 31mm (1,220mils) of coating on metal substrates with USB and Bluetooth® data output making it compatible with ElcoMaster® software.



For a wide range of probes to meet your specific application, see page 7-22

* The Elcometer 456 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

Elcometer 456 Separate Coating Thickness Gauge

Scan and Auto Repeat Modes



Using the Scan Probe in Scan Mode

Using the Elcometer 456 with the Scan Probe in scan mode enables users to significantly reduce dry film thickness inspection times without affecting accuracy:

- Slide the Scan Probe over the entire surface area, as the probe is lifted off the surface the gauge displays the average coating thickness value, the highest thickness and the lowest thickness values.
- Each set of three readings (average, high and low) can be displayed on the run graph and stored into the memory.
- During each scan the Elcometer 456 displays the live thickness reading together with an analogue bar graph which graphically indicates the thickness relative to both the nominal thickness and any user-defined limits.



Using the Scan Probe in Auto Repeat Mode

When the Scan Probe is slid over the coated surface in Auto Repeat Mode*, a coating thickness reading is taken approximately every half a second. Each individual dry film thickness reading is stored into the memory.

With a reading rate in excess of 140 readings per minute, the Auto Repeat Mode can significantly speed up the dry film thickness inspection of large coated areas.



* Scan and Auto Repeat Modes require an Elcometer 456 Model T gauge with Scan Probe.

Elcometer 456 Separate Coating Thickness Gauge

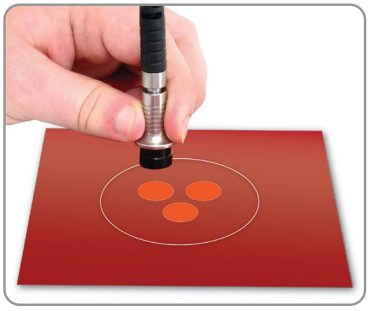
Scan Probes



The Scan Probes further enhance the speed and accuracy of field based dry film coating thickness measurement:

- Featuring a highly durable 'snap on' replaceable probe cap
- A revolutionary design which allows users to take individual readings or rapidly scan large surface areas - without damaging the probe or coating
- Uses the Elcometer 456's patented offset feature, ensuring that any cap wear during use[1] is incorporated within the calibration process - the gauge even informs the user when to replace the cap.
- Standard Scan Probe or larger Roller Bearing Scan Probe available
- Roller Bearing Scan Probe is ideal for large coated structures, abrasive coatings and pre-construction primers.

Counted Average and Fixed Batch Modes



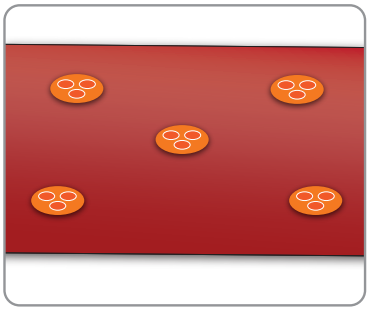
Counted Average Mode

- The Elcometer 456 Model S and Model T are supplied with the Counted Average Mode
- Once the user has defined the number of individual gauge readings to be taken within a spot measurement, the gauge stores the average of the individual gauge readings into the memory.

Fixed Batch Sizes

- The Fixed Batch Size feature within the Elcometer 456 Model T allows users to define the maximum number of readings in each batch.
- Once the maximum number of readings has been reached the gauge automatically opens up a new batch which is linked to the previous batch (name-1, name-2, etc.).

Working with Standards and Test Methods



- International Standards and test methods often describe the number of individual gauge readings to be taken in a spot measurement and/or the number of spot measurements required over a defined surface area.
- SSPC PA2 requires a minimum of three gauge readings to be taken per spot measurement and five spot measurements over 10m^2 (~100ft^2).
- The Elcometer 456 Model S or Model T can be set with a counted average of three and a fixed batch size of five to meet these requirements. Each batch defines an area of measurement.
- When the Scan Probe is connected to the Elcometer 456 Model T with Auto Repeat Mode selected, SSPC PA2 (or similar test methods) can be completed more than 40% faster.

[1] When tested on smooth surfaces probe end caps have been scanned in excess of 50km (30 miles)

Elcometer 456 Separate Coating Thickness Gauge

Product Features	■ Standard	□ Optional	
	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, waterproof & dust resistant; *equivalent to IP64*	■	■	■
Bright colour screen; *with permanent backlight*	■	■	■
Scratch & solvent resistant display; *2.4" (6cm) TFT*	■	■	■
Large positive feedback buttons	■	■	■
USB power supply; *via PC*	■	■	■
Test certificate	■	■	■
2 year gauge warranty[1]	■	■	■
Automatic rotating display; *0°, 90°, 180° & 270°*	■	■	■
Ambient light sensor; *with adjustable auto brightness*	■	■	■
Emergency light	■	■	■
Tap awake from sleep	■	■	■
Gauge software updates[2]; *via ElcoMaster® software*	■	■	■
Data output	■	■	■
USB; *to computer*	■	■	■
Bluetooth®; *to computer, Android™ & iOS[3] devices*		■	■
On screen statistics	■	■	■
Number of readings; *η* Mean (average); $\bar{x}$ Standard deviation; σ Highest reading; *Hi* Lowest reading; *Lo* Coefficient of variation; *CV%,* Elcometer index value[4]; *EIV*	■	■	■
Nominal dry film thickness; *NDFT*		■	■
IMO PSPC; *%>NDFT, %>90<NDFT, 90:10 pass/fail*		■	■
High & low limits; *definable audible & visual alarms*		■	■
Number of readings above high limit;		■	■
Number of readings below low limit;		■	■
Live reading trend graph; *in Batch Mode*		■	■
ElcoMaster® software & USB cable	□	■	■
Replaceable screen protectors	□	■	■
Protective case	■	■	■
Plastic transit case	□	□	■
Separate models; *with automatic probe recognition*	■	■	■
Probe type; *Ferrous (F), Non-Ferrous (N), Dual (FNF)*	F, N, FNF	F, N, FNF	F, N, FNF
Measurement range; *see page 7-22 for probe selection*	0-31mm 0-1,220mils	0-31mm 0-1,220mils	0-31mm 0-1,220mils
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; *for calibration according to ISO19840*		■	■
Predefined calibration & measurement methods		■	■
ISO, SSPC PA2, Swedish, Australian		■	■

[1] The Elcometer 456 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. [2] Internet connection required

[3] Visit www.elcometer.com/sdk to find out how to integrate Elcometer's MFi certified products to your App.

[4] Elcometer Index Values are used in the automotive industry to assess a coating's overall quality; USA Patent Number US7606671B2

Elcometer 456 Separate Coating Thickness Gauge

Product Features

■ Standard □ Optional

	Model B	Model S	Model T
Automatic calibration; *for rapid calibration*		■	■
Calibration memory type; *gauge (g) or gauge & batch (gb)*	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® software*		■	■
Limits; *user definable audible & visual pass/fail warnings*		■	■
Gauge (g) or gauge & batch specific (gb) limits		g	gb
Date and time stamp		■	■
Review, clear & delete batches		■	■
Batch types; *normal, counted average, IMO PSPC*		■	■
Navsea Mode			■
Batch review graph			■
Copy batches and calibration settings			■
Alpha-numeric batch names; *user definable on the gauge*			■
Scan & Auto Repeat Modes; *with Scan Probe connected*			■
Fixed Batch Size Mode; *with batch linking*			■

Technical Specification

Model	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	●
Display Information	2.4” (6cm) QVGA colour TFT display, 320 x 240 pixels			
Battery Type	2 x AA batteries, rechargeable batteries can also be used			
Battery Life	approximately 24 hours of continuous use at 1 reading per second*			
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)	161g (5.68oz)			
Operating Temperature	-10 to 50°C (14 to 122°F)			
Packing List	Elcometer 456 gauge, wrist harness, transit case (T), protective case (B, S, T), 1 x screen protector (S, T), 2 x AA batteries, operating instructions, USB cable (S, T), ElcoMaster® software (S, T) For separate gauge probe options see page 7-22			

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B244, 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 2178, 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

* Using default settings & lithium batteries, alkaline or rechargeable batteries may differ

● Certificate supplied as standard

Elcometer 456

Probe Range for Separate Coating Thickness Gauge

All **Elcometer 456 probes** are available in a number of designs and scale ranges to meet your specific application.



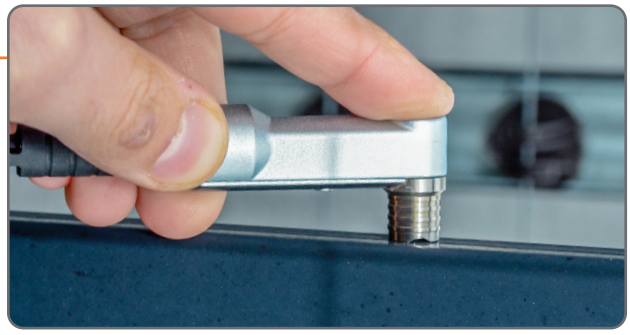
- Fully interchangeable and available in a number of designs and scale ranges
- Supplied with a Test Certificate and a set of calibration foils
- Ferrous, non-ferrous and dual FNF probes available
- Ergonomic design, ideal for continuous use
- Temperature stable measurements

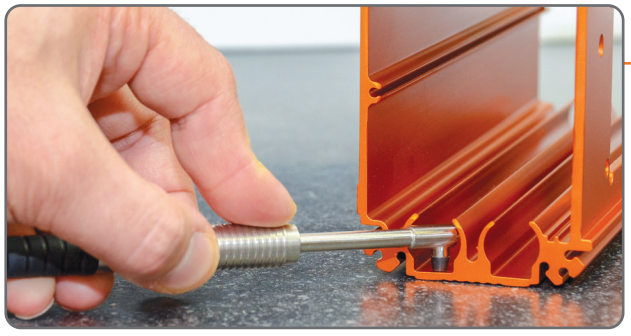
Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Choosing the correct probe for your coating thickness gauge:

Ferrous Probes (F)

- Ferrous probes measure non-magnetic coatings on ferromagnetic substrates.
- Elcometer 456 ferrous gauges accept any ferrous probe.





Non-Ferrous Probes (N)

- Non-ferrous probes measure non-conductive coatings on non-ferrous metal substrates.
- Elcometer 456 non-ferrous gauges accept any non-ferrous probe.

Dual Probes (FNF)

- Dual FNF probes measure both ferrous and non-ferrous applications with automatic substrate detection.
- Elcometer 456 FNF gauges accept all ferrous, non-ferrous and dual FNF probes.





High Temperature

- Elcometer probes have a maximum operating temperature of 80°C (176°F)*.
- Separate ferrous probes have a maximum operating temperature of 150°C (300°F)*.
- Hi-Temperature PINIP™ has a maximum operating temperature of 250°C (480°F)*.

To find out if you should be using a ferrous or non-ferrous probe,
see page 7-38



*The stated temperature is the substrate temperature, and the duty cycle of the probe must be reduced to ensure a minimal temperature build-up within the probe.

Elcometer 456 Probe Range for Separate Coating Thickness Gauge

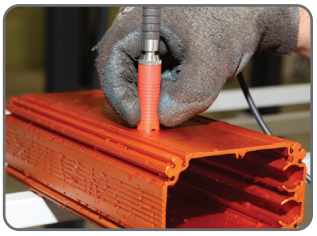
Choosing the correct probe for your coating thickness gauge:

Straight Probes



Standard Straight Probe

Standard probes measure coatings on both flat and curved surfaces.



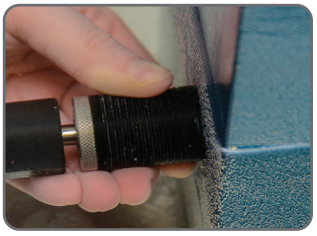
Anodising Probe

Chemical resistant & washable - ideal for the anodising environment.



Mini Probe

Mini probes are ideal for harder to reach areas and edges.



Waterproof Probe

Sealed for use underwater at depth, even in diving gloves.



Soft Coating Probe

Large surface area probes are for soft materials (HVCA approved).



Thick Coatings Probe

Ideal for measuring coatings up to 31mm thick.

Scan Probes



Standard Scan Probe

Rapidly scan large surface areas without damaging the probe or the coating.



Ball Bearing Scan Probe[1]

Clip on adaptors for large coated structures, abrasive coatings and pre-construction primers.

[1] UK Patent Number: 2571577

Elcometer 456 Probe Range for Separate Coating Thickness Gauge

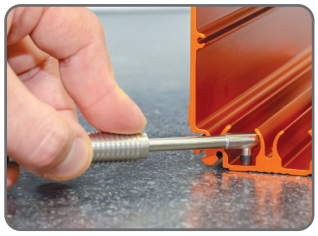
Choosing the correct probe for your coating thickness gauge:

Angled Probes



Right Angle Probe

Take readings in areas with restricted clearance.



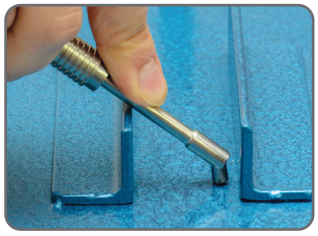
Mini Right Angle Probe

For measuring coatings on edges, narrow pipes or small surface areas.



Telescopic Probe

Extending probes for hard to reach areas.



45° Angle Probe

Measure difficult to access or complex areas.

Plug In Integral Probes (PINIP™)



PINIP™ Integral Probe

Transforms a separate gauge into an integral gauge, ideal for single handed use.



Hi-Temperature PINIP™

Measure coatings on ferrous substrates up to 250°C (480°F).

Armoured Cable Probes



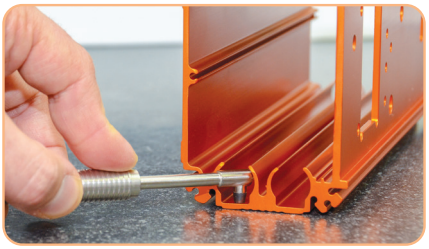
F / FNF Armoured Probe

Reinforced heavy duty cables reduce the risk of cable damage.

Elcometer 456

Probe Range for Separate Coating Thickness Gauge

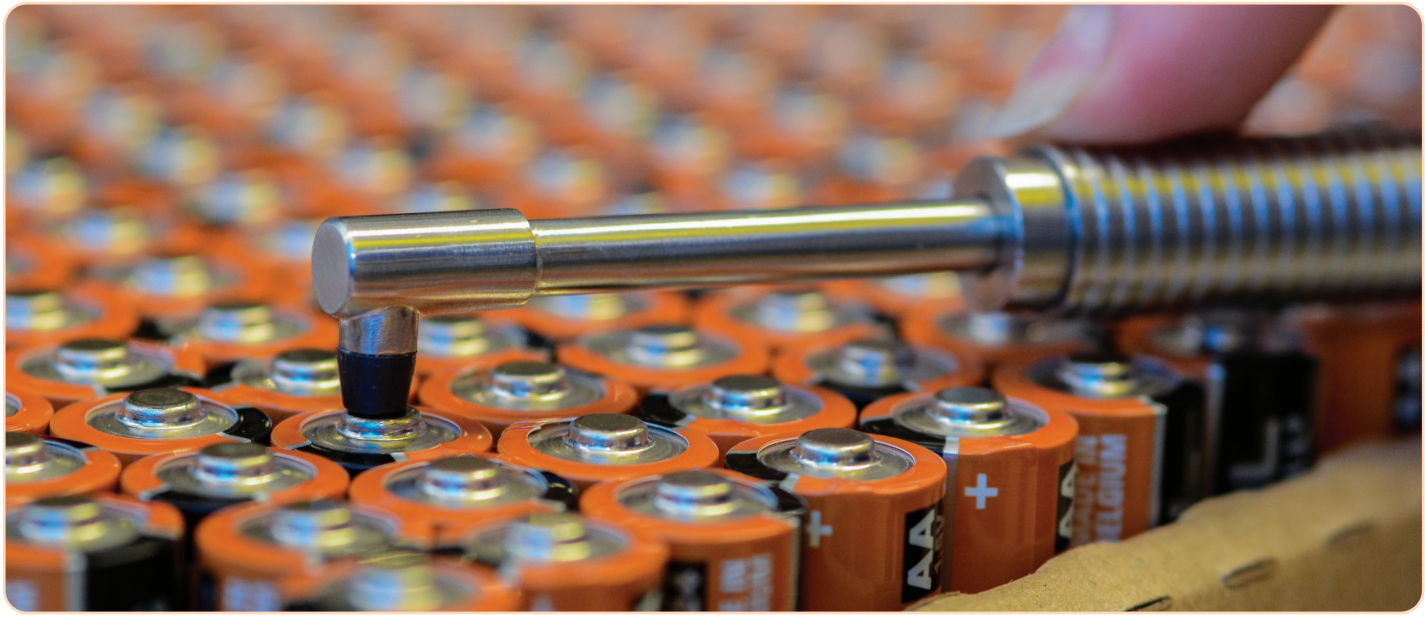
Scale 0.5 Probe Range — 0-500µm / 0-20mils



Accuracy[a]:	±1-3% or ±2.5µm	±1-3% or ±0.1mil
Range:	0-500µm	0-20mils
Resolution:	0.1µm: 0-100µm 1µm: 100-500µm	0.01mil: 0-5mils 0.1mil: 5-20mils
Certificate:	●	

See '#' on the probes table on the opposite page for comparison.

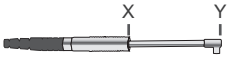




a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode

● Certificate supplied as standard.

c. Probe length is measured from X to Y



d. For Elcometer 456 Model T gauges only
Elcometer 456 probes are covered by a 1 year warranty

Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Scale 0.5 Probe Range 0-500µm / 0-20mils

Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
2	45° Angle Mini Probe	300mm (11.80”)	T456CFM3R45D	18mm (0.71”)	3mm (0.12”)
3	Right Angle Mini Probe	300mm (11.80”)	T456CFM3R90D	16mm (0.63”)	3mm (0.12”)
4	Right Angle Mini Probe	150mm (5.90”)	T456CFM3R90C	16mm (0.63”)	3mm (0.12”)
5	Straight Mini Probe	150mm (5.90”)	T456CFM3---C	6mm (0.24”)	3mm (0.12”)
6	45° Angle Mini Probe	45mm (1.77”)	T456CFM3R45A	16mm (0.63”)	3mm (0.12”)
7	Right Angle Mini Probe	45mm (1.77”)	T456CFM3R90A	16mm (0.63”)	3mm (0.12”)
8	Straight Mini Probe	45mm (1.77”)	T456CFM3---A	6mm (0.24”)	3mm (0.12”)

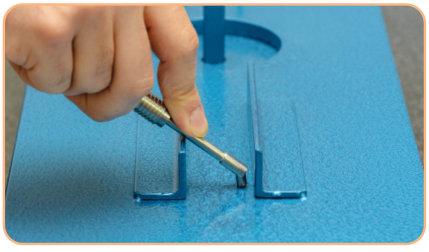
Non-Ferrous (N) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Right Angle Mini Probe	400mm (15.70”)	T456CNM3R90E	16mm (0.63”)	4mm (0.16”)
4	Right Angle Mini Probe	150mm (5.90”)	T456CNM3R90C	16mm (0.63”)	4mm (0.16”)
5	Straight Mini Probe	150mm (5.90”)	T456CNM3---C	6mm (0.24”)	4mm (0.16”)
7	Right Angle Mini Probe	45mm (1.77”)	T456CNM3R90A	16mm (0.63”)	4mm (0.16”)
8	Straight Mini Probe	45mm (1.77”)	T456CNM3---A	6mm (0.24”)	4mm (0.16”)

Non-Ferrous - Graphite (N)

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Right Angle Mini Probe	400mm (15.70”)	T456CNMG3R90E	16mm (0.63”)	4mm (0.16”)
4	Right Angle Mini Probe	150mm (5.90”)	T456CNMG3R90C	16mm (0.63”)	4mm (0.16”)
7	Right Angle Mini Probe	45mm (1.77”)	T456CNMG3R90A	16mm (0.63”)	4mm (0.16”)

Scale FM7 Probe Range 0.6-3.8mm / 25-150mils



Accuracy[a]:	±7.5% or ±114µm	±7.5% or ±4.5mils
Range[d]:	0.60-3.8mm	25-150mils
Resolution:	1µm: 0-1mm 10µm: 1-3.8mm	0.1mil: 0-139.3mils 1.0mil: 39.4-150mils
Certificate:	•	

Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
6	45° Angle Mini Probe	45mm (1.77”)	T456CFM7R45A	20mm (0.79”)	6.5 mm (0.26”)

Elcometer 456 — Probe Range for Separate Coating Thickness Gauge

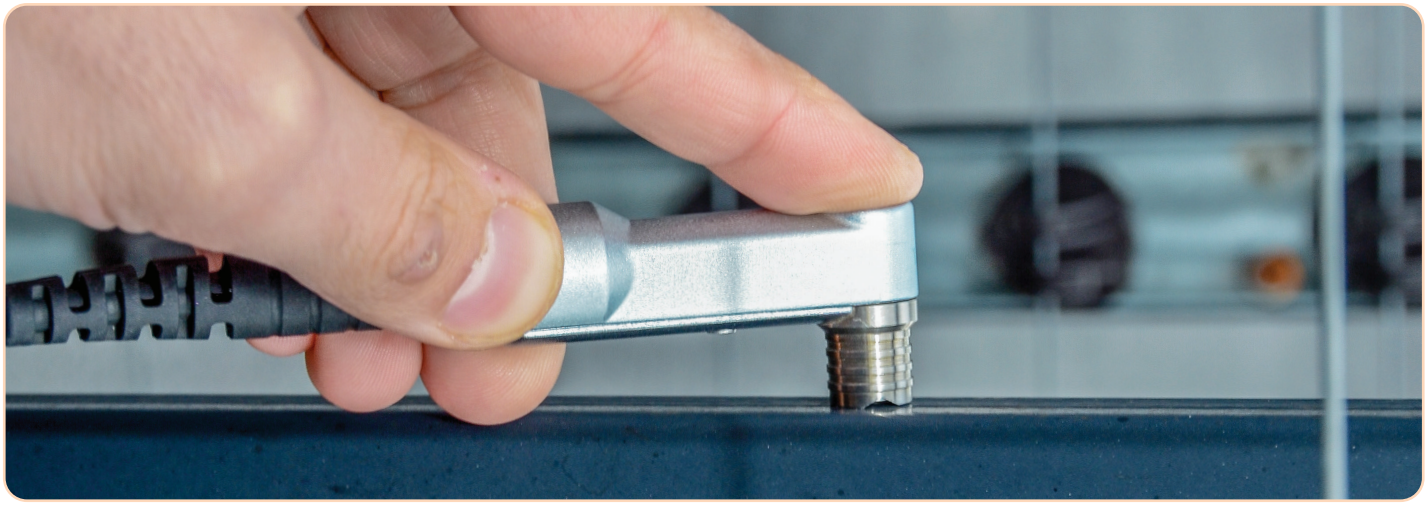
Scale 1 Probe Range — 0-1500µm / 0-60mils



Accuracy[ae]:	±1-3% or ±2.5µm	±1-3% or ±0.1mil
Range[d]:	0-1,500µm	0-60mils
Resolution:	0.1µm: 0-100µm 1µm: 100-1,500µm	0.01mil: 0-5mils 0.1mil: 5-60mils
Certificate:	•	

See '#' on the probes table on the opposite page for comparison.

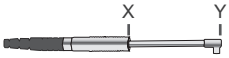




a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode

• Certificate supplied as standard.

c. Probe length is measured from X to Y



d. Excluding Scan Probe end cap
e. Scan Probe calibrated using a sample of the uncoated substrate
Elcometer 456 probes are covered by a 1 year warranty

Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77")	T456CF1S	85mm (3.35")	4mm (0.16")
1	Straight Probe sealed	45mm (1.77")	T456CF1E	85mm (3.35")	4mm (0.16")
2	Scan Probe	45mm (1.77")	T456CF1U	86mm (3.38")	15mm (0.59")
3	Scan Probe armoured	45mm (1.77")	T456CF1UARM	140mm (5.51")	15mm (0.59")
4	90° Probe	45mm (1.77")	T456CF1R	28mm (1.10")	4mm (0.16")
5	90° Mini Probe	45mm (1.77")	T456CFM5R90A	16mm (0.63")	4mm (0.16")
5	90° Mini Probe sealed	45mm (1.77")	T456CFME5R90A	16mm (0.63")	4mm (0.16")
5	90° Mini Probe sealed, 2m cable	45mm (1.77")	T456CFME5R90A-2	16mm (0.63")	4mm (0.16")
6	PINIP™ Integral Probe		T456CF1P	170mm (6.69")	4mm (0.16")

Non-Ferrous (N) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77")	T456CN1S	85mm (3.35")	4mm (0.16")
4	90°Probe	45mm (1.77")	T456CN1R	28mm (1.10")	4mm (0.16")
5	Mini 90°Probe	45mm (1.77")	T456CNM5R90A	16mm (0.63")	4mm (0.16")
5	Mini 90°Probe	150mm (5.90")	T456CNM5R90C	16mm (0.63")	4mm (0.16")
5	Mini 90°Probe	400mm (15.7")	T456CNM5R90E	16mm (0.63")	4mm (0.16")
6	PINIP™ Integral Probe		T456CN1P	180mm (7.09")	4mm (0.16")
7	Anodiser Probe	45mm (1.77")	T456CN1AS	100mm (3.94")	4mm (0.16")

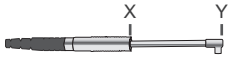
Ferrous & Non-Ferrous (FNF) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77")	T456CFNF1S	88mm (3.46")	F: 4mm (0.16") N: 6mm (0.24")
2	Scan Probe	45mm (1.77")	T456CFNF1U	89mm (3.50")	15mm (0.59")
4	Right Angle Probe	45mm (1.77")	T456CFNF1R	38mm (1.50")	F: 4mm (0.16") N: 6mm (0.24")
6	PINIP™ Integral Probe		T456CFNF1P	180mm (7.09")	F: 4mm (0.16") N: 6mm (0.24")
8	Straight Probe armoured cable	45mm (1.77")	T456CFNF1ARM	185mm (7.28")	F: 4mm (0.16") N: 6mm (0.24")

a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode

- Certificate supplied as standard.

c. Probe length is measured from X to Y
d. Excluding Scan probe end cap
e. Scan Probe calibrated using a sample of the uncoated substrate
Elcometer 456 probes are covered by a 1 year warranty



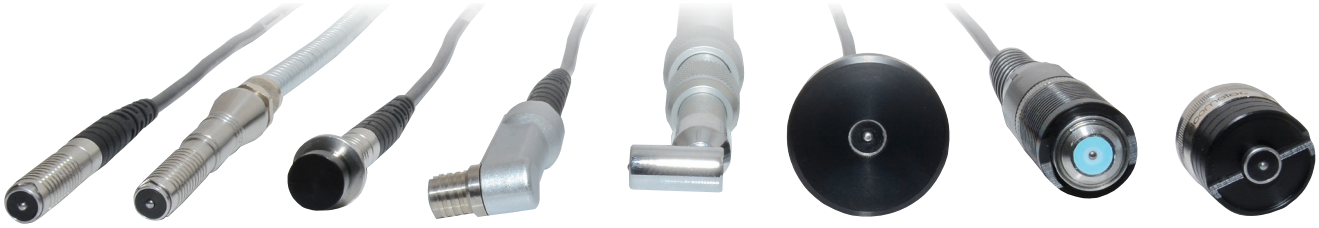
Elcometer 456 — Probe Range for Separate Coating Thickness Gauge

Scale 2 Probe Range — 0-5mm / 0-200mils



Accuracy[ae]:	±1-3% or ±20µm	±1-3% or ±1.0mil
Range[d]:	0-5mm	0-200mils
Resolution:	1µm: 0-1mm 10µm: 1-5mm	0.1mil: 0-50mils 1.0mil: 50-200mils
Certificate:	●	

See '#' on the probes table on the opposite page for comparison.

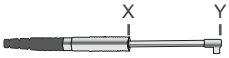


1 2 3 4 5 6 7 8



a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode
Elcometer 456 probes are covered by a 1 year warranty
● Certificate supplied as standard.

c. Probe length is measured from X to Y



d. Excluding Scan Probe end cap
e. Scan Probe accuracy is ±3% or ±0.02mm (0.8mil) with cap fitted, ±1-3% or ±0.02mm (0.8mil) without cap, when calibrated using a sample of the uncoated substrate.

Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Ferrous (F) Probes

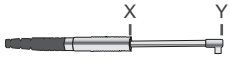
#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77”)	T456CF2S	89mm (3.50”)	8mm (0.32”)
2	Straight Probe armoured cable	45mm (1.77”)	T456CF2ARM	138mm (5.43”)	8mm (0.32”)
3	Scan Probe	45mm (1.77”)	T456CF2U	90mm (3.54”)	15mm (0.59”)
4	90° Probe	45mm (1.77”)	T456CF2R	32mm (1.26”)	8mm (0.32”)
5	Telescopic Probe	56-122cm (22-48”)	T456CF2T	36mm (1.42”)	8mm (0.32”)
6	Soft Coating Probe	45mm (1.77”)	T456CF2B	89mm (3.50”)	8mm (0.32”)
7	Waterproof Probe 1m (3’) cable	45mm (1.77”)	T456CF2SW	138mm (5.43”)	8mm (0.32”)
7	Waterproof Probe 5m (15’) cable	45mm (1.77”)	T456CF2SW-5	138mm (5.43”)	8mm (0.32”)
7	Waterproof Probe 15m (45’) cable	45mm (1.77”)	T456CF2SW-15	138mm (5.43”)	8mm (0.32”)
7	Waterproof Probe 30m (98’) cable	45mm (1.77”)	T456CF2SW-30	138mm (5.43”)	8mm (0.32”)
7	Waterproof Probe 50m (164’) cable	45mm (1.77”)	T456CF2SW-50	138mm (5.43”)	8mm (0.32”)
7	Waterproof Probe 75m (250’) cable	45mm (1.77”)	T456CF2SW-75	138mm (5.43”)	8mm (0.32”)
8	PINIP™ Integral Probe		T456CF2P	174mm (6.85”)	8mm (0.32”)
8	Hi-Temperature PINIP™		T456CF2PHT	174mm (6.85”)	8mm (0.32”)

Non-Ferrous (N) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77”)	T456CN2S	88mm (3.46”)	14mm (0.55”)
8	PINIP™ Integral Probe		T456CN2P	185mm (7.28”)	14mm (0.55”)

a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode
Elcometer 456 probes are covered by a 1 year warranty
● Certificate supplied as standard.

c. Probe length is measured from X to Y
d. Excluding Scan Probe end cap
e. Scan Probe accuracy is ±3% or ±0.02mm (0.8mil) with cap fitted, ±1-3% or ±0.02mm (0.8mil) without cap, when calibrated using a sample of the uncoated substrate.



Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Scale 3 Probe Range 0-13mm / 0-500mils



Accuracy[a]:	±1-3% or ±50µm	±1-3% or ±2.0mils
Range[d]:	0-13mm	0-500mils
Resolution:	1µm: 0-2mm 10µm: 2-13mm	0.1mil: 0-100mils 1.0mil: 100-500mils
Certificate:	●	

See '#' on the probes table on the opposite page for comparison.

1 

2 

3 

Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77”)	T456CF3S	102mm (4.02”)	14mm (0.55”)
2	PINIP™ Integral Probe		T456CF3P	184mm (7.24”)	14mm (0.55”)

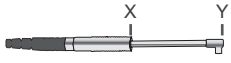
Non-Ferrous (N) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
3	Straight Probe	45mm (1.77”)	T456CN3S	170mm (6.69”)	35mm (1.38”)

a. Whichever is the greater
b. FNF (F): FNF probe in F Mode FNF (N): FNF probe in N Mode

● Certificate supplied as standard.

c. Probe length is measured from X to Y
d. Excluding Scan Probe end cap
Elcometer 456 probes are covered by a 1 year warranty



Elcometer 456 Probe Range for Separate Coating Thickness Gauge

Scale 6 Probe Range F: 0-25mm / 0-980mils N: 0-30mm / 0-1,200mils

Accuracy[a]:	±1-3% or ±100µm	±1-3% or ±4.0mils
Range[d]:	F: 0-25mm N: 0-30mm	F: 0-980mils N: 0-1,200mils
Resolution:	10µm: 0-2mm 100µm: 2-30mm	1mil: 0-100mils 10mils: 100-1,200mils
Certificate:	•	



See '#' on the probes table below for comparison.

1 

2 

Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77”)	T456CF6S	150mm (5.90”)	51 x 51mm² (2 x 2 inch²)
2	Straight Probe armoured cable	45mm (1.77”)	T456CF6ARM	190mm (7.48”)	51 x 51mm² (2 x 2 inch²)

Non-Ferrous (N) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
1	Straight Probe	45mm (1.77”)	T456CN6S	160mm (6.30”)	58mm (2.29”)
2	Straight Probe armoured cable	45mm (1.77”)	T456CN6ARM	200mm (7.87")	58mm (2.29”)

Scale 7 Probe Range 0-31mm / 0-1,220mils

Accuracy[a]:	±1-3% or ±100µm	±1-3% or ±4.0mils
Range[d]:	0-31mm	0-1,220mils
Resolution:	10µm: 0-2mm 100µm: 2-31mm	1.0mil: 0-100mils 10mils:100-1,220mils
Certificate:	•	



Ferrous (F) Probes

#	Description	Probe Length[c]	Part Number	Minimum Headroom	Minimum Sample Diameter[b]
2	Straight Probe armoured cable	45mm (1.77”)	T456CF7ARM	200mm (7.87”)	55 x 55mm² (2.17 x 2.17 inch²)

Elcometer 456 & 355 **Probe Placement Jig**

The **Elcometer Probe Placement Jig** is the ideal accessory for measuring coatings on small or complex components when the highest levels of repeatability and accuracy are required.

Increases the gauge's repeatability and reproducibility

Housings to suit other probes are available as optional accessories



Compatible with Elcometer 456 probes and Elcometer 355 probes

Ideal for small and large components alike

Elcometer 456 & 355

Probe Placement Jig



The Elcometer Probe Placement Jig is the ideal accessory for measuring coatings on small or complex components when the highest levels of repeatability and accuracy are required.

The Probe Placement Jig makes the gauge score highly in repeatability and reproducibility studies by placing the probe accurately, at the same angle and in the same place on the substrate each time.

Ideal for small and large components alike, the Probe Placement Jig is supplied with a probe housing and a component holder to suit straight Scale 1 or Scale 2 Elcometer 456 probes and standard F1, F2, F4, F5 and N1 Elcometer 355 probes. Housings to suit other probes are available as optional accessories.

Technical Specification

Part Number	Description
T95012880	Probe Placement Jig

Each Probe Placement jig is supplied with a probe housing and a component holder to suit straight Scale 1 or Scale 2 Elcometer 456 probes and standard F1, F2, F4, F5 and N1 Elcometer 355 probes.

T95013028	Component Hand Vice
T95012888	Cable Release Assembly - ideal for remote measurements
T95015961	Dual FNF Probe Housing Adaptor
T95016896	Mini Probe Housing Adaptor



For a wide range of probes to meet your specific application,
see page 7-22

Elcometer 456

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 Hand Grip



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



Scan Probe Replacement End Caps

Highly durable - when tested on smooth surfaces probe end caps have been used in excess of 50km (30 miles) - each end cap snaps on to the end of the Scan probe significantly enhancing the lifetime of the probe.

F & Dual FNF Probes	Scale 1	Scale 2
Accuracy:	±3% or ±2.5µm (±1mil)	±1-3% or ±0.02mm (±1mil)
Measuring Range:	100-1,000µm (3.9-39mils)	0.1-4.5mm (4-180mils)
Part Number	T456C23956	
Description	Replacement Scan Probe End Caps (3 per pack)	



Roller Scan Probe Cap

Clip on adaptor designed for large coated structures, abrasive coatings and pre-construction primers. The Roller Scan Cap can scan in excess of 50km (30 miles) on rough surfaces without damaging the substrate or probe.

F & Dual FNF Probes	Scale 1	Scale 2
Accuracy:	±6%	±5%
Measuring Range:	100-1,000µm (3.9-39mils)	0.5-4.5mm (20-180mils)
Part Number	T456C29050	
Description	Elcometer 456 Roller Scan Probe Cap[1]	

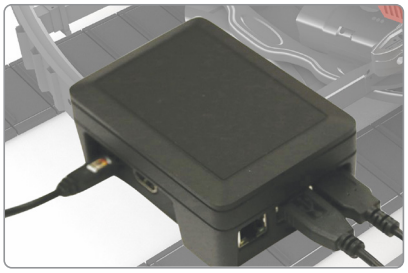


For a full range of calibration standards and foil sets see page 7-54

[1] UK Patent Number: 2571577

Elcometer 456

Accessories



Data Output Controller
Enables data to be output from the Elcometer 456 via RS232 ports for the purposes of controlling automated production lines.

The Elcometer Software Support Team or users can produce their own customised software to utilise the data output from the Elcometer 456 gauge in order to remotely trigger pass/fail criteria for their processes.

Technical Specification

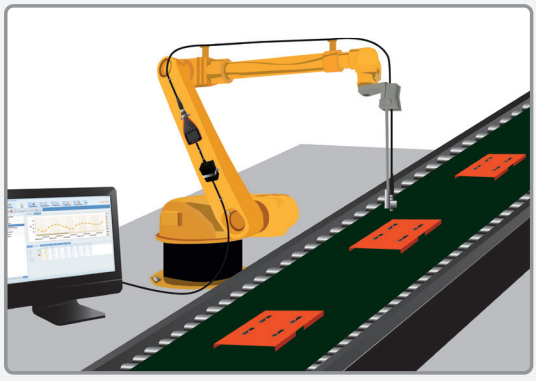
Part Number	Description
T99925387	Elcometer Data Output Controller
Operating Temperature	0 to 50°C (32°F to 122°F)
Data Input	USB
Data Output	One RS232 serial output via 9 way D-Type connector
Power Supply	Requires 5V 1A(min) DC supply via mini USB. External plug-in mains adaptor with interchangeable UK/EU/US/AUS pins supplied.
Packing List	Elcometer Data Output Controller, USB to RS232 converter lead, power supply (with 4 sets of interchangeable pins)

Using the Data Output Controller

The Elcometer 456 coating thickness gauge probe is attached to a robot arm which automatically measures dry film thickness on the production line.

The Elcometer 456 connects to the data output controller to transfer live dry film thickness readings via RS232 ports to the automated production line.

Customised software for the data output controller can be produced, using high/low limits to trigger a pass or fail on the automated production line, helping to improve quality.





For a full range of calibration standards and foil sets see page 7-54

Elcometer

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.

	SUBSTRATE									
COATING	Aluminium	Brass	Bronze	Copper	Steel	Magnesium	Stainless Steel	Titanium	Uranium	Zinc
Aluminium	-	-	-	-	F	-	-	-	-	-
Anodising	NF	-	-	-	-	NF	-	-	-	-
Brass	-	-	-	-	F	-	-	-	-	-
Bronze	-	-	-	-	F	-	-	-	-	-
Cadmium	-	-	-	-	F	-	-	-	-	-
Ceramic	-	-	-	-	F	-	-	-	-	-
Chrome (Hard)	NF*	-	-	NF*	F	-	-	-	-	-
Copper	-	-	-	-	F	-	-	-	-	-
Eloxal	NF	-	-	-	F	-	-	-	-	-
Epoxy	NF	NF	NF	NF	F	-	NF	NF	-	NF
Galvanising	-	-	-	-	F	-	-	-	-	-
Lacquer	NF	NF	NF	NF	F	-	NF	-	-	NF
Metal Spray	-	-	-	-	F	-	-	-	-	-
Molybdenum 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

elcometer®



Accurately measure your product and oven temperature profiles with the **Elcometer 215 Oven Data Logger** and **ElcoMaster® software.**

See page 9-3

elcometer®

Dry Film Thickness - Digital

Elcometer 456 **Integral Coating Thickness Gauge**

The **Elcometer 456** Coating Thickness Gauge is available with an **integral probe**; ideal for single handed operation for consistent, repeatable and accurate results.



Measure coatings up to 13mm (500mils) on metal substrates

Reading rate of 70+ per minute

Easy to read, user definable display with automatic screen brightness

Ergonomic design, ideal for continuous use

Stores up to 150,000 readings in alphanumeric batches

Scratch and solvent resistant screen

Bigfoot™ integral probe

Bluetooth® wireless technology

compatible with ElcoMaster®

etv video available elcometer.tv

Elcometer 456

Integral Coating Thickness Gauge



Large easy to read measurements in Metric and Imperial units



Bigfoot™ integral probe for accurate measurements



Easy to use and minimum set up required



USB and Bluetooth® data output to iPhone[2] or Android™ devices

Easy

Calibrated and ready for immediate use

Easy to use menus, large buttons and colour LCD screen with auto rotate; factory calibrated and ready to use, straight from the box.

Accurate

Accurate measurements on smooth, rough, thin and curved surfaces

With a thickness measurement capability to ±1% and increased reading resolution, the Elcometer 456 produces accurate, temperature stable measurements every time.

Reliable

Peace of mind

Repeatable and reproducible and available with a 2 year[1] manufacturer's warranty; giving you peace of mind.

Rugged

Durable and suitable for use on production lines

Suitable for use on production lines, the Elcometer 456 is sealed, heavy duty and impact resistant with dust and waterproof equivalent to IP64.

Powerful

Store up to 150,000 readings in 2,500 batches

Measures up to 13mm (500mils) of coating on metal substrates with USB and Bluetooth® data output making it compatible with ElcoMaster® software.

STANDARDS:

AS 2331.1.4, AS 3894.3-B, AS/NZS 1580.108.1, ASTM B244, 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 2178, 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

[1] The Elcometer 456 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. [2] Compatible with iPod, iPhone and iPad.

Elcometer 456 Integral Coating Thickness Gauge for Metal Substrates

Product Features	Model B	Model S	Model T
	■ Standard	■ Standard	■ Standard
	□ Optional	□ Optional	□ Optional
Fast, accurate reading rate; *70+ readings per minute*	■	■	■
Repeatable & reproducible measurements	■	■	■
Easy to use menu structure; *in 30+ languages*	■	■	■
Tough, impact, waterproof & dust resistant; *equivalent to IP64*	■	■	■
Bright colour screen; *with permanent backlight*	■	■	■
Scratch & solvent resistant display; *2.4" (6cm) TFT*	■	■	■
Large positive feedback buttons	■	■	■
USB power supply; *via PC*	■	■	■
Test certificate	■	■	■
2 year gauge warranty[1]	■	■	■
Automatic rotating display; *0°, 90°, 180° & 270°*	■	■	■
Ambient light sensor; *with adjustable auto brightness*	■	■	■
Emergency light	■	■	■
Tap awake from sleep	■	■	■
Gauge software updates[2]; *via ElcoMaster® software*	■	■	■
Data output	■	■	■
USB; *to computer*	■	■	■
Bluetooth®; *to computer, Android™ & iOS[3] devices*		■	■
On screen statistics	■	■	■
Number of readings; *n,* Mean (average); $\bar{x}$, Standard deviation; σ Highest reading; *Hi,* Lowest reading; *Lo,* Coefficient of variation; *CV%,* Elcometer index value[4]; *EIV*	■	■	■
Nominal dry film thickness; *NDFT*		■	■
IMO PSPC; *%>NDFT, %>90<NDFT, 90:10 pass/fail*		■	■
High & low limits; *definable audible & visual alarms*		■	■
Number of readings above high limit;		■	■
Number of readings below low limit;		■	■
Live reading trend graph; *in Batch Mode*		■	■
ElcoMaster® software & USB cable	□	■	■
Replaceable screen protectors	□	■	■
Protective case	■	■	■
Plastic transit case	□	□	■
Integral models; *with automatic gauge switch on*	■	■	■
Probe type; *Ferrous (F), Non-Ferrous (N), Dual (FNF)*	F, N, FNF	F, N, FNF	F, N, FNF
Measurement range	0-13mm 0-500mils	0-1500µm 0-60mils	0-1500µm 0-60mils
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; *for calibration according to ISO19840*		■	■
Predefined calibration & measurement methods		■	■
ISO, SSPC PA2, Swedish, Australian		■	■

[1] The Elcometer 456 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. Elcometer 456 probes are covered by a 1 year warranty. [2] Internet connection required

[3] Visit www.elcometer.com/sdk to find out how to integrate Elcometer's MFi certified products to your App.

[4] Elcometer Index Values are used in the automotive industry to assess a coating's overall quality; USA Patent Number US7606671B2

Elcometer 456 Integral Coating Thickness Gauge for Metal Substrates

Product Features

■ Standard □ Optional

	Model B	Model S	Model T
Automatic calibration; *for rapid calibration*		■	■
Calibration memory type; *gauge (g) or gauge & batch (gb)*	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® software*		■	■
Limits; *user definable audible & visual pass/fail warnings*		■	■
Gauge (g) or gauge & batch specific (gb) limits		g	gb
Date and time stamp		■	■
Review, clear & delete batches		■	■
Batch types; *normal, counted average, IMO PSPC*		■	■
Navsea Mode			■
Batch review graph			■
Copy batches and calibration settings			■
Alpha-numeric batch names; *user definable on the gauge*			■
Scan & Auto Repeat Modes; *with Scan probe connected*			■
Fixed Batch Size Mode; *with batch linking*			■

Technical Specification

Scale 1 Range: 0-1,500µm (0-60mils) Accuracy[7]: ±1-3% or ±2.5µm (±0.1mil)
Resolution: 0.1µm: 0-100µm; 1µm: 100-1,500µm (0.01mil: 0-5mils; 0.1mil: 5-60mils)

Model	Model B	Model S	Model T	Certificate
Elcometer 456 Ferrous Integral	A456CFBI1	A456CFSI1	A456CFTI1	●
Elcometer 456 Non-Ferrous Integral	A456CNBI1	See separate gauges with N1 PINIP™ Probe	See separate gauges with N1 PINIP™ Probe	●
Elcometer 456 Dual FNF Integral	A456CFNFBI1	A456CFNFSI1	A456CFNFTI1	●

Scale 2 Range: 0-5mm (0-200mils) Accuracy[7]: ±1-3% or ±20µm (±1.0mil)
Resolution: 1µm: 0-1mm; 10µm: 1-5mm (0.1mil: 0-50mils; 1mil: 50-200mils)

Model	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	●

For higher resolution & accuracy on thin coatings Scale 2 gauges can be switched to the Scale 1 mode measurement performance

Scale 3 Range: 0-13mm (0-500mils) Accuracy[7]: ±1-3% or ±50µm (±2.0mils)
Resolution: 1µm: 0-2mm; 10µm: 2-13mm (0.1mil: 0-100mils; 1mil: 100-500mils)

Model	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	●

Display Information	2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels
Battery Type	2 x AA batteries, rechargeable batteries can also be used
Battery Life	approximately 24 hours of continuous use at 1 reading per second[8]
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)	156g (5.50oz)
Operating Temperature	-10 to 50°C (14 to 122°F)
Packing List	Elcometer 456 gauge, calibration foils, 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® software (S, T)

[7] Whichever is the greater [8] Using default settings & lithium batteries, alkaline or rechargeable batteries may differ ● Certificate supplied as standard.

Elcometer 415

Paint & Powder Coating Thickness Gauge

The **Elcometer 415** Industrial Paint & Powder Thickness Gauge provides fast, accurate paint & powder thickness measurements on smooth & thin industrial coated surfaces.

Auto rotating large colour display provides clear visibility whatever the angle of measurement

Scratch, solvent & powder resistant display

Large easy to read values in microns or mils



Rugged & resistant to powder coatings ingress equivalent to IP64

Easy to use, ergonomic design provides maximum comfort for continuous use

1 point & 2 point calibration ensures accuracy on smooth & thin coated substrates

Incredibly fast (60+ readings per minute), reducing inspection times, increasing productivity

Automatically switches between ferrous & non-ferrous substrates*

* Elcometer 415 FNF models

Bluetooth® wireless technology

compatible with ElcoMaster®

etv video available elcometer.tv

Elcometer 415

Paint & Powder Coating Thickness Gauge



Large reading with key statistics

Statistics

The Elcometer 415 doesn't just take a thickness measurement

In addition to the coating thickness, the Elcometer 415 displays the key statistical values required to assess the overall industrial finishing; number of readings (n), average ($\bar{x}$), lowest (Lo) and highest (Hi) paint thickness.



Ideal for measuring dry film thickness on thin substrates

Accurate

Stay accurate with simple calibration

The Elcometer 415 is easy to use and has 1 point & 2 point calibration, ensuring accurate measurements on smooth & thin industrial paint & powder coated surfaces.



360° auto rotating display for clear readings at any angle

Reliable

Each gauge is designed to last

Robust, durable & powder resistant, the Elcometer 415 is available with a 2 year[1] manufacturer's warranty; giving you peace of mind.



Transfer live data via Bluetooth® to PC, Android™ or iOS mobile devices[2]

Wireless Connectivity

Connect to any PC, Android™ or iOS mobile device

As each measurement is taken the new Elcometer 415 instantly transmits the thickness values via USB or Bluetooth®[2] to your PC or mobile device using ElcoMaster® or your own software application.

STANDARDS:

AS2331.1.4, AS/NZS 1580.108.1, ASTM B 499, ASTM D 1186, 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 2178, 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

[1] The Elcometer 415 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

[2] Elcometer 415 Model T

Elcometer 415 Paint & Powder Coating Thickness Gauge

Technical Specification

Model	Model B	Model B	Model T	Model T	Certificate
Part Number	A415CFBI	A415CFNFBI	A415CFTI	A415CFNFTI	●
Built in Probe Type	Ferrous	Ferrous/ Non-Ferrous	Ferrous	Ferrous/ Non-Ferrous	
Live Data Output	USB	USB	Bluetooth® & USB	Bluetooth® & USB	
On Screen Statistics	Number of readings (n), Average/Mean ($\bar{x}$), Lowest reading (Lo), Highest reading (Hi)				
Fast Accurate Reading Rate	60+ readings per minute		Measurement Range: 0 - 1,000µm (0 - 40mils)		
Accuracy[3]	±1-3% or ±2.5µm (±0.1mil)				
Resolution	0.1µm: 0 -100µm; 1µm: 100 - 1,000µm (0.01mil: 0 - 5mils; 0.1mil: 5 - 40mils)				
Minimum Substrate Thickness	Steel: 300µm (12mils)		Aluminium: 100µm (4mils) - FNF gauges only		
Operating Temperature	-10 to 50°C (14 to 122°F)		Relative Humidity (RH): 0 to 95%		
Power Supply	2 x AA Batteries or via USB Cable *(rechargeable batteries can also be used)*				
Battery Life[4]	Alkaline: Approximately 16 hours Lithium: Approximately 24 hours				
Gauge Dimensions *(h x w x d)*	14.1 x 7.30 x 3.70cm (5.55 x 2.87 x 1.46")				
Gauge Weight	156g (5.5oz) *(including batteries)*				
Packing List	Elcometer 415 gauge, 2 x AA batteries, steel & aluminium check pieces[5], foil set, wrist strap, impact resistant carry case, screen protector[6], calibration test certificate, operating instructions, USB cable[6], ElcoMaster® software CD[6] & 2 year warranty extension card[7]				

Accessories

T99916925	Calibration Check Piece; Steel (Ferrous)
T99916901	Calibration Check Piece; Aluminum (Non-Ferrous)
T99022255-1	Foil Set; 0-1,000µm (0 - 40mils)
T99022255-1C	Certified Foil Set; 0 - 1,000µm (0 - 40mils)
T99921325	USB Cable
T99922341	Self Adhesive Screen Protectors (Pack of 10)

[3] When subject to a 2-point calibration: ±1% when calibrated close to the required thickness, ±3% across the range

[4] Using default settings & lithium batteries, alkaline or rechargeable batteries may differ

[5] F models: steel check piece; FNF models: steel & aluminium check pieces

[6] Elcometer 415 Model T

[7] The Elcometer 415 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

● Calibration test certificate supplied as standard.

Elcometer 311 Automotive Refinishing Gauge

The **Elcometer 311** Automotive Refinishing Gauge is one of the fastest on the market, used to instantly measure paint thickness and provide an indication of the overall condition of paintwork.



Fast reading rate of 60+ readings per minute significantly reduces inspection times

Scratch, solvent & water resistant colour display for protection against accidental damage

Ambient light sensor automatically adjusts the screen brightness to your lighting condition

Ergonomic design gives you maximum comfort when measuring vehicles all day

Large easy to read values in mils & microns

Switches automatically to measure coatings on steel & aluminium[1]

Bluetooth® wireless technology

compatible with ElcoMaster®

etv video available elcometer.tv

Elcometer 311

Automotive Refinishing Gauge



Large easy to read display

Statistics

The Elcometer 311 doesn't just take a thickness measurement

In addition to the coating thickness, the Elcometer 311 displays the key statistics such as the number of readings (n), average coating thickness (x̄), the lowest paint thickness (Lo) and the Elcometer Index Value (EIV)[2].



Durable & impact resistant case clips straight on to your belt

Powerful

The higher the EIV the more severe the PPW

The EIV provides the inspector with a single number which illustrates the vehicle's overall paint condition and establishes any previous paintwork (PPW) that may have been undertaken.



360° auto rotating display for measuring at any angle

Reliable

Giving you peace of mind

Robust, durable & weather resistant, the Elcometer 311 is available with a 2 year[3] manufacturer's warranty.



USB and Bluetooth® data output to iPhone[5] or Android™ devices

Wireless Connectivity

Connect to any PC, Android™ or iOS mobile device

Instantly transmit your thickness values via USB or Bluetooth® to your PC or mobile device using ElcoMaster®[4] or your own software application.

STANDARDS:
ISO 2178, ISO 2808, ISO 2808-7C, ISO 2808-7D, ISO 2808-12A, ISO 2808-11B, ASTM E376, JIS K 5600-1-7, AS/NZS 1580.108.1

[1] Elcometer 311 FNF models [2] EIV Patent number US 7,606,671 B2 [3] The Elcometer 311 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. [4] Available on the Elcometer 311 Model T only
[5] Compatible with iPod, iPhone and iPad.

Elcometer 311 Automotive Refinishing Gauge

Technical Specification

	Model B	Model B	Model T	Certificate
Part Number	A311CFBI	A311CFNFBI	A311CFNFTI	●
Built in Probe Type	Steel (F)	Steel & Aluminium (FNF)	Steel & Aluminum (FNF)	
Live Data output via Bluetooth® or USB			■	
Zero Calibration	■	■	■	
On screen statistics	Number of readings (n), Mean/Average ($\bar{x}$), Lowest reading (Lo), Elcometer Index Value (EIV)[1]			
Fast accurate reading rate	60+ readings per minute	Measurement Range	0-500µm / 0-20mils	
Accuracy[2]	±5% or ±20µm (1.0mil)			
Resolution	10µm (0.5mil)			
Minimum Substrate Thickness[3]	Steel: 800µm (30mils)	Aluminium: 300µm (12mils) - FNF gauges only		
Operating Temperature	-10 to 50°C / 14 to 122°F	Relative Humidity (RH)	0 to 95%	
Power Supply	2 x AA Batteries or via USB *(rechargeable batteries can also be used)*			
Battery Life[4]	Alkaline: approximately 16 hours Lithium: approximately 24 hours			
Gauge Dimensions *(h x w x d)*	14.1 x 7.30 x 3.70cm / 5.55 x 2.87 x 1.46"			
Gauge Weight	156g / 5.5oz *(including batteries)*			
Packing List	Elcometer 311 gauge, 2 x AA batteries, steel & aluminium check pieces[5], calibration check foil, wrist strap, impact resistant carry case, calibration test certificate, operating instructions, 2 year warranty extension card[6]			

Accessories

T99916925	Calibration Check Piece; Steel (Ferrous)
T99916901	Calibration Check Piece; Aluminum (Non-Ferrous)
T99022570-7A	Calibration Check Foil; Nominal value 125µm (5mils)
T99922341	Self Adhesive Screen Protectors (Pack of 10)
T99921325	USB Cable

Elcometer Index Value - EIV

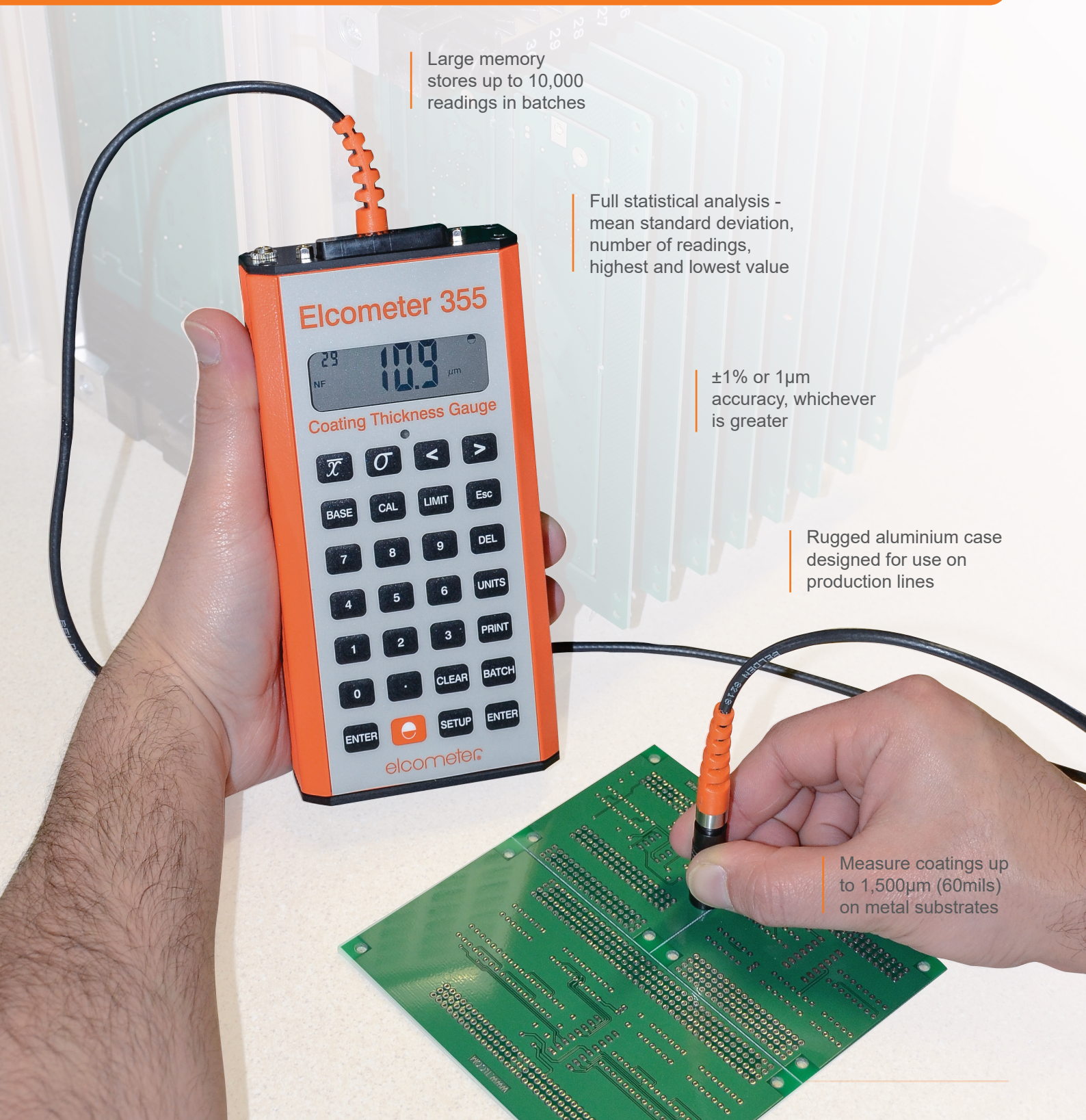
The Elcometer Index Value (EIV) provides the inspector with a single number which illustrates the vehicle's overall paint condition and establishes whether any previous paint work (PPW) has been undertaken. This quantifiable number determines the extent of rework & the overall quality of the vehicle being appraised.

[1] EIV Patent number US 7,606,671 B2 [2] Whichever is the greater [3] For specified accuracy
[4] Using default settings & lithium batteries, alkaline or rechargeable batteries may differ [5] F models: steel check piece; FNF models: steel & aluminium check pieces
[6] The Elcometer 311 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.
● Calibration test certificate supplied as standard.

Elcometer 355

Precision Coating Thickness Gauge

The **Elcometer 355's** watchwords are accuracy, simplicity, versatility and durability making this a state of the art hand-held measuring system packed with time-saving and cost-saving features.



Large memory stores up to 10,000 readings in batches

Full statistical analysis - mean standard deviation, number of readings, highest and lowest value

±1% or 1µm accuracy, whichever is greater

Rugged aluminium case designed for use on production lines

Measure coatings up to 1,500µm (60mils) on metal substrates

Elcometer 355

Precision Coating Thickness Gauge



Rugged aluminium case

Accurate

Accuracy is key

With an accuracy of ±1% or 1µm, the Elcometer 355 is ideal for measuring thin coatings where precision and accuracy is key.



Probe Modules accurate to ±1% or 1µm, whichever is the greater

Statistics

Store key statistics for evaluation

In addition to the coating thickness, the Elcometer 355 can record the key statistics such as the number of readings (n), average coating thickness ($\bar{x}$), the lowest paint thickness (Lo) and standard deviation (σ).

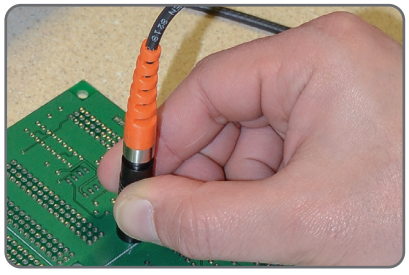


Large easy to read display

Rugged

Rugged, reliable and impact resistant

Robust & durable aluminium case, the Elcometer 355 is designed for use on production lines.



Choice of probes for the relevant applications

Powerful

Store up to 10,000 readings in 200 batches

Measures up to 1,500µm (60mils) of coating on metal substrates with data output making it compatible with ElcoMaster® software.

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 2178, 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

Elcometer 355 Precision Coating Thickness Gauge

Technical Specification

Part Number	Description	Certificate
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 Auto Repeat Mode 130/140 readings per minute	
Data Output	RS232C Serial or Parallel Output via D25 Type Connector (Female)	
Memory	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 Gauge, leather carry case, precision hand grip, 3 x AA batteries, ElcoMaster® software, PC cable and operating instructions	

Probe Range



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 1,100mm (43").

Other probe options available, please visit www.elcometer.com for more infomation.

Scale 1 Range: 0-1,500µm (0-60mils) Accuracy*: ±1% or ±1µm (±0.04mil)
Resolution: 0.1µm: 0-200µm; 0.5µm: 200-500µm; 1µm: 500-1,500µm (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 Telescopic	T35511959	30mm (1.18")	6mm (0.24")	●
N1 Standard	T35511982	85mm (3.35")	8mm (0.31")	●

Scale 2 Range: 0-5mm (0-200mils) Accuracy*: ±1% or ±5µm (±0.2mil)
Resolution: 2µm: 0-500µm; 5µm: 500-5,000µm (0.1mil: 0-20mils; 0.2mil: 20-200mils)

Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate
F2 Telescopic	T35511960	36mm (1.42")	10mm (0.39")	●
N2 Standard	T35511984	88mm (3.46")	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")	●

* Whichever is greater ○ Optional Calibration Certificate available. ● Test Certificate supplied as standard.

Elcometer 355

Probe Placement Jig



The Elcometer Probe Placement Jig is the ideal accessory for measuring coatings on small or complex components when the highest levels of repeatability and accuracy are required.

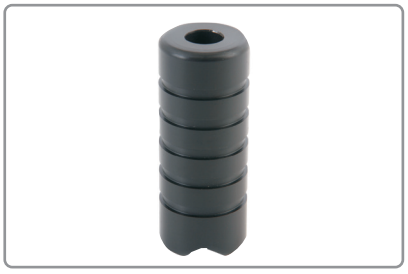
The Probe Placement Jig makes the gauge score highly in repeatability and reproducibility studies by placing the probe accurately, at the same angle and in the same place on the substrate each time.

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.

Technical Specification

Part Number	Description
T95012880	Probe Placement Jig
T95013028	Component Hand Vice
T95012888	Cable Release Assembly - ideal for remote measurements
T95015589	N4 Probe Adaptor - must be purchased for use with N4 Probes

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



For more information on the Probe Placement Jig, see page 7-34

Elcometer 990

Individual Precision Foils



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[1]		Certificate[2]
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")	1,000µm	(40mils)	○
T99022570-14B	Grey-Blue	75 x 50mm	(2.95 x 1.97")	1,000µm	(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")	1,500µm	(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)	○
T99022570-23A	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[3]	Grey	n/a		1,500µm	(60mils)	○
T45618978-[3]	Grey	n/a		5,000µm	(197mils)	○

[1] Actual foil values may vary, but are accurately labelled

[2] A Certificate can be supplied with any combination of up to 8 Foils

[3] 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.

○ Optional Calibration Certificate available.

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
- 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

Description	Foil Values (µm)	Foil Values (mils)	Un-Certified	Certified
Scale 1 Foil Set; 0-1500µm (0-60mils)	25, 50, 125, 250, 500, 1,000	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, 1,000, 2,000, 3,000	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, 1,000, 2,000, 4,000, 8,000	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; 0-800µm (0-32mils)	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 (0-1,200mils)	1,000, 2,000, 5,000, 9,500, 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*; 0-5mm (0-200mils)	25, 50, 125, 250, 500, 1,000, 2,000, 2,000	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.



* The Scale 2B foil sets are designed for soft coating probes and have a larger foil surface area.

Elcometer 990

Zero Test Plates



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 page 7-54.

Technical Specification

Description	Size	Size	Ferrous	Non-Ferrous	Certificate
Precision Zero Test Plate (±1%)	50.8 x 25.4mm	2.0 x 1.0”	T9994910-	T9994911-	
Zero Test Plate	76.2 x 50.8mm	3.0 x 2.0”	T9999529-	T9999530-	
Zero Test Plate (large)	76.2 x 101.6mm	3.0 x 4.0”	T9994054-	T9994055-	○
Steel (F) Checkpiece*	50.8 x 88.9mm	2.0 x 3.5”	T99916925	-	
Aluminium (N) Checkpiece*	50.8 x 88.9mm	2.0 x 3.5”	-	T99916901	

* To be used only with the Elcometer 311 or Elcometer 415

○ Optional Calibration Certificate available.

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See page 17-2


elcometer®



Temperature, Humidity & Moisture

8



Monitoring climatic conditions, such as temperature, relative humidity, dewpoint and moisture, is often vital to the successful application of a coating and are critical to the resulting quality and performance of the coated product.

Climatic Conditions: Elcometer offer a complete range of dewpoint and relative humidity meters, thermometers, dataloggers and moisture meters to monitor climatic conditions.

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), 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.

Moisture: 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.

On porous materials such as 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, which generates steam – causing significant coating finish issues.

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.

Digital Dewpoint Meter

- The Elcometer 319 measures and records all relevant climatic parameters required to determine whether the conditions are suitable for painting.
- See page **8-4**



Digital Hygrometer

- The Elcometer 308 measures relative humidity and surface temperature, the Elcometer 309 also measures the difference between surface temperature and the dewpoint temperature.
- See page **8-8**



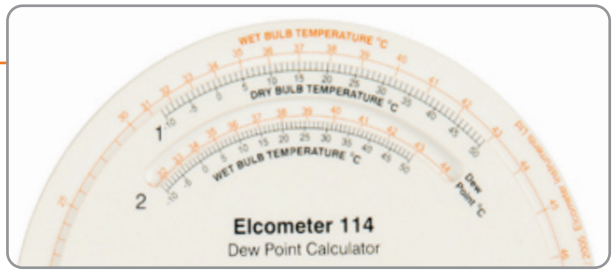
Whirling & Sling Hygrometers

- These manually operated instruments are designed to determine the dewpoint and relative humidity at any given time.
- See page **8-9**



Dewpoint Calculators

- Provides accurate values of dewpoint and relative humidity from the wet bulb and dry bulb temperatures measured by a Whirling or Sling Hygrometer.
- See page **8-10**



Thermometers

- A range of analogue and digital thermometers designed to measure surfaces or liquids in Celsius or Fahrenheit.
- See page **8-11**



Digital Moisture Meter

- Using two pin probes or non-invasive probes the Elcometer 7000 offers accurate and easy to use moisture measurement.
- See page **8-15**



elcometer®

Temperature, Humidity & Moisture

Elcometer 319 Dewpoint Meter

The rugged **Elcometer 319** Dewpoint Meter is designed to measure and record all relevant climatic parameters required to determine whether the conditions are suitable for painting.



- Integrated magnets allow the gauge to be attached to the substrate during remote logging
- Stores 25,000 records in up to 999 batches[1]
- A hand-held Dewpoint meter with both manual and automatic data logging in one gauge[1]
- Robust temperature sensors
- Easy to use, intuitive menu structure
- Fully dustproof and waterproof (equivalent to IP66)
- Visual and audible indication of user defined limits for any or all parameters
- Gauges can be recertified at Elcometer Authorised Service Centres

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2 YEAR* WARRANTY

[1] Model T only

* The Elcometer 319 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

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



Large easy to read measurements in degrees °C or °F



View up to 5 user selectable parameters on screen



Review individual readings

Measure and record climatic parameters:

- RH Relative humidity
- Ta Air temperature
- Ts Surface temperature
- Td Dewpoint temperature
- TΔ TΔ (the difference between surface temperature and dewpoint)
- Tdb Dry Bulb temperature
- Twb Wet Bulb temperature
- Te External probe temperature (K-type)
- SH Specific Humidity[1]

Versatile

- Can be used as either a hand-held dewpoint meter or as a remote data logging monitor[2]
- Rapid response time
- Each gauge can be powered by either 2 x AA batteries (for up to 400 hours[1] 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
- Intelligent memory calculates total available logging time when using batches
- Gauges can be recertified at Elcometer Authorised Service Centres

Accurate

- Meets requirements of ISO 8502 standard
- Each instrument is supplied with a Calibration Certificate
- Readings are switchable between Celsius and Fahrenheit
- All readings are time & date stamped

[1] Based on 1 reading every 10 minutes in Logging Mode.
[2] Model T only

Elcometer 319

Dewpoint Meter



Te - Ideal for use as a simple thermometer



Waterproof and rugged to IP66



Remote monitoring of climatic parameters



Fully dustproof and waterproof

Simple

- Easy menu-driven user interface in multiple languages
- Clear, illuminated display showing up to five user-defined parameters
- Arrow indicators show parameter trends

Flexible

- The gauge can be used as either a hand-held Dewpoint meter or as a remote data logging monitor[1]
- Integrated K-Type connector allows measurement of surface temperature during remote logging using a separate probe
- Using an external probe, the thermometer mode transforms the gauge into a thermometer - ideal for measuring the temperature of paint prior to application
- Hold/freeze function allows manual readings to be reviewed before being added into the memory

Durable

- Available with a two year[2] manufacturer's warranty; giving you peace of mind
- Safe to use in climates between -20°C (-4°F) and +80°C (+176°F)
- Waterproof and dustproof rating equivalent to IP66
- Rugged and ergonomic design, re-engineered sensors have greater durability for an extended life

Powerful

Connect the Elcometer 319 via Bluetooth® or USB to a PC, Android™ or iOS mobile device & download the data into an inspection application or into ElcoMaster® for instant report generation.

Bluetooth® wireless technology | compatible with ElcoMaster | etv video available elcometer.tv

[1] Model T only [2] The Elcometer 319 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

Elcometer 319 Dewpoint Meter

Technical Specification

Model	Model S	Model T	Certificate
Part Number	G319----S	G319----T	●
Reading Parameters - RH, Ta, Ts (Te[6]), Td, TΔ, Tdb, Twb[1], SH[1, 8]	■	■	
Statistics - number of readings, standard deviation, mean, coefficient of variation, minimum, maximum	■	■	
Dustproof & waterproof - 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 24 hours	
Data Output			
USB		■	
Bluetooth® *to computer, Android™ & iOS[4] devices*		■	
ElcoMaster® software & USB cable		■	

	Temperature Range	Accuracy	Resolution
Gauge[5]	-20 to +80°C (-4 to +176°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)[7]	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)	-40 to +200°C (-40 to+392°F)	±0.5°C (±1°F)[6]	0.1°C (0.1°F)
Relative Humidity (RH)	0 to 100%RH	±3%RH[3]	0.1%
Gauge & LCD Operating Range	-20°C to +80°C (-4°F to +176°F)		
Power Supply	2 x AA 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, protective pouch, calibration certificate, USB cable[8], ElcoMaster®[8] and operating instructions		

Accessories

T31920162	External Magnetic Surface Temperature Probe; -40 to +80°C (-40 to +176°F)
T9996390-	External Liquid Temperature Probe; -200 to +1100°C (-328 to +2012°F)
T99921325	USB Cable
T99916063	Wrist Strap
T99923480	Protective Pouch

[1] Calculated Value [2] With Part Number T31920162 [3] At 1m/s [4] Visit www.elcometer.com/sdk to find out how to integrate Elcometer's MFi certified products to your App [5] Do not expose the gauge to temperatures outside the gauge and LCD operating range [6] Accuracy ±2°C (4°F) with K Type probes supplied by Elcometer. Gauge tested with voltage input [7] Accuracy ±0.75°C below 10°C (±1.35°F below 50°F) [8] Model T only ● Certificate supplied as standard.

Elcometer 308 & 309

Digital Hygrometers





Elcometer 308



Elcometer 309

STANDARDS:
BS 7079-B4 (Elcometer 309),
ISO 8502-4 (Elcometer 309)

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 beyond recommended limits can have a detrimental effect 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): Expressed as a percentage, RH is the ratio of the amount of water vapour actually held by the air compared to the maximum amount of water vapour the air could hold at a given temperature. Typical maximum RH values specified by paint manufacturers are between 75% and 85%.

Technical Specification

Model	Elcometer 308 Hygrometer	Elcometer 309 Delta T Hygrometer	Certificate
Part Number	G308----1	G309----1	●
	Ts RH	TΔ RH	
Operating Range	-20ºC to +80ºC (-4ºF to +176ºF)	-20ºC to +80ºC (-4ºF to +176ºF)	
Surface Temperature (TS)	-20ºC to +80ºC (-4ºF to +176ºF)	-20ºC to +80ºC (-4ºF to +176ºF)	
Relative Humidity (RH) & Accuracy[1]	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 batteries or via USB Cable	2 x AA batteries or via USB Cable	
Battery Life	Greater than 40 hours (Backlight off)	Greater than 40 hours (Backlight off)	
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.	

[1] at 1m/s

● Basic Calibration Certificate supplied as standard.

Elcometer 116

Whirling & Sling Hygrometers



STANDARDS:
ASTM E 337-B, BS 2842, ISO 8502-4

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.

- Manual operation
- Spirit filled thermometers

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Technical Specification

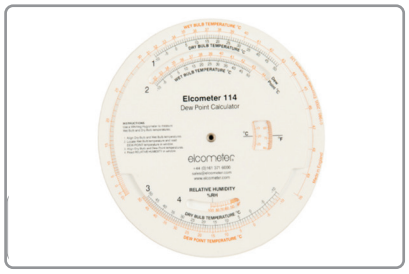
Part Number	Description		
G116A---1	Elcometer 116A Whirling Hygrometer - Metric °C		
G116C---1	Elcometer 116C Sling Hygrometer - Metric °C		
G116C---2	Elcometer 116C Sling Hygrometer - Imperial °F		
Measuring Range	-5°C to 50°C (23°F to 122°F)		
Dimensions	17 x 22mm (6.9 x 10”)	Weight	300g (0.6lb)
Packing list	Elcometer 116 Whirling Hygrometer, RH look-up table, carry case and operating instructions Elcometer 116 Sling Hygrometer, slide rule table and operating instructions		

Accessories

T1164441-	Elcometer 116A Spare Thermometer (°C)
T11631224	Elcometer 116C Spare Thermometer (°C) (Pack of 2)
T1164479-	Elcometer 116C Spare Thermometer (°F)
T1164487-	Elcometer 116A Wicks (Pack of 5)
T11631168	Elcometer 116C Wicks (Pack of 4)
T11600212	Elcometer 116A Replacement Slide Rule
T13827259	Pure Distilled Water - 250ml (8.5fl oz)
T13827494	Pure Distilled Water - 1,000ml (33.8fl oz)

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.

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Td RH TΔ

Technical Specification

Part Number	Description
G114----2	Elcometer 114 Dewpoint Calculator



Elcometer 113

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.

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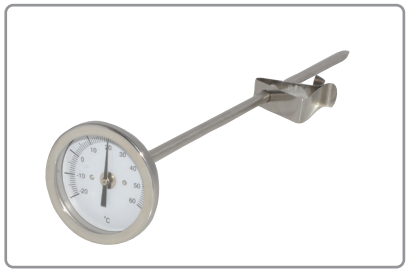
Ts

Technical Specification

Part Number	Description	Scale Range
G113----1	Elcometer 113 Magnetic Thermometer	-40°C to 60°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----2B	Elcometer 113 Economy Magnetic Thermometer	0°C to 120°C
Dimensions	57 x 20mm (2.25 x 0.8”)	
Weight	56g (1.9oz)	
Packing List	Elcometer 113 Magnetic Thermometer	

Elcometer 210

Paint Thermometer



It is often important to ensure the temperature of the paint to be applied is at a temperature which will ensure correct application.

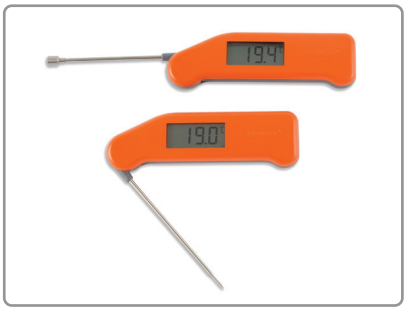
The Elcometer 210 Paint Thermometer is supplied with a clip which enables the thermometer to be hooked on to the edge of a paint pot, allowing accurate temperature measurement of the paint.

Technical Specification

Part Number	Description
G210----1	Elcometer 210 Paint Thermometer
Scale Range	-20°C to 60°C (-4°F to 140°F)
Dimensions	300mm (12”) length with a 50mm (1.97”) dial
Weight	67g (2.4oz)
Packing List	Elcometer 210 Paint Thermometer

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 probe when not in use, conveniently folds back into the side of the instrument, preventing damage.

- Liquid or surface temperature options available
- User switchable between °C and °F
- Resolution can be set to 0.1°C (0.1°F) or 1°C (1°F)

etv video available elcometer.tv

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 batteries
Battery Life	Approximately 1,500 hours
Auto Switch Off Time	10 minutes
Case Dimensions	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

Elcometer 213/2

Digital Waterproof Thermometer







The Elcometer 213/2 is a simple, easy-to-use digital thermometer for quick and easy measurements of surface and liquid temperature plus the temperature of soft materials.

Features:
- Rubber bumper seals for impact resistance
- Waterproof case (IP67 protection)
- Extruded aluminium case for superior durability
- °C/°F switchable
- Easy to read LCD display

Probes are available to purchase separately.

etv video available elcometer.tv Ts Te

Technical Specification

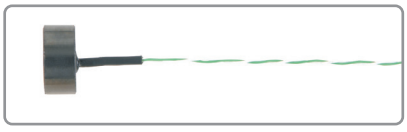
Part Number	Description	Certificate
G213----2	Elcometer 213/2 Digital Thermometer[1]	○
Operating Range[2]	-49°C to +1372°C (-56°F to 2500°F)	
Accuracy	±1% of the reading ±1 digit	
Resolution	0.1°C (0.1°F) up to 299.9°C (572°F), 1°C (1°F) above 299.9°C (599.9°F)	
Battery Life	5,000 hours	
Power Supply	3 x AAA (LR03) 1.5V	
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, protective pouch and operating instructions	

[1] Probes are not supplied as standard with the Elcometer 213/2; please select from the list below
[2] Operating range is dependent on probe used

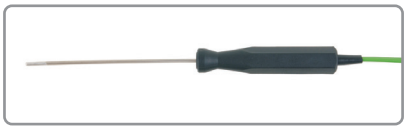
Accessories

T99911728	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: -200°C to 1100°C (-328°F to 2012°F)
T2136391-	Needle Probe, 130 x 3mm Diameter (5.11 x 0.12”)	Range: -50°C to 400°C (-58°F to 752°F)

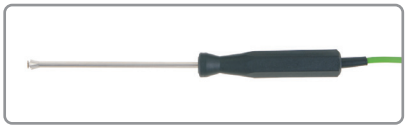
Other probes available on request. Contact Elcometer for further information.



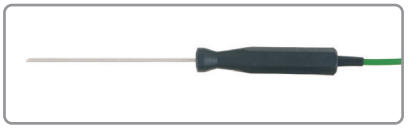
Magnetic
T99911728



Liquid
T9996390



Surface
T2136069



Needle
T2136391

○ Optional Calibration Certificate available.

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 of -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”).

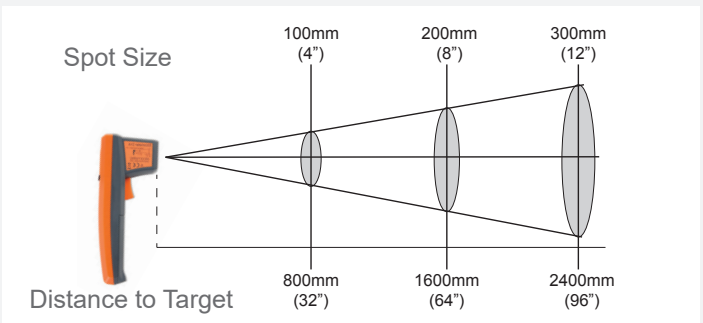
etv video available elcometer.tv

Ts

Technical Specification

Part Number	Description		
G214L----3	Elcometer 214 Infrared 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 AAA batteries	Battery Life	14+ hours continuous use
Dimensions	166 x 34 x 64 (6.5 x 1.3 x 2.5”)	Weight	113g (3.98oz)
Packing List	Elcometer 214 Infrared Digital Laser Thermometer, 2 x AAA batteries, wrist strap and operating instructions		

Digital Laser Thermometer



Elcometer 7000

Digital Moisture Meter



The Elcometer 7000 offers accurate and easy to use moisture measurement.

The Digital Moisture Meter has two pin probes that allows the gauge to be pressed on to a surface to enable you to take a measurement of the immediate area. It also has a non-invasive probe on the back of the gauge for moisture detection.

- Calibrated ready for use
- Instant readings on a clear, easy to read scale
- Fully portable and battery operated

Technical Specification

Model	Elcometer 7000PS Digital Moisture Meter	Certificate
Part Number	G7000PS	○
Measuring Range	70 to 999 relative (non-invasive) Dry (green); 70 - 169 At risk (yellow); 170 - 199 Wet (red); 200 - 999 7.9% to 99% WME (pin measurement) Dry (green); 7 - 16.9 At Risk (yellow); 17 - 19.9 Wet (red); 20 - 99.9	
Measurement Depth	Non-invasive up to 19mm (¾") Pin up to 12.7mm (½")	
Display	LCD Display with separate colour indicators	
Dimensions	190 x 70 x 49mm (7.5 x 2.75 x 1.9")	
Weight	225g (8oz)	
Power Supply	9V battery (~ 20 hours continuous use)	
Packing list	Elcometer 7000PS Moisture Meter, HD MC probe, Deep Wall probe 127mm (5"), pin calibration check, wood calibration chart, battery, carry case and operating instructions	

○ Optional Calibration Certificate available


F1 F2 F3 F4



Oven Temperature Profiling

9



Temperature profiling provides an effective method for measuring the actual environmental and product temperature during the cure process - essential for ensuring a quality finish and a successful cure of a powder coating.

Not all components are alike and are rarely of a uniform thickness, density or thermal capacity. This means that the oven temperature settings have to be adjusted to suit the coated product.

Monitoring and making adjustments to the oven temperature ensures that the product is brought to and held at, the specified temperature to ensure consistent quality of cure and visual properties at all times.

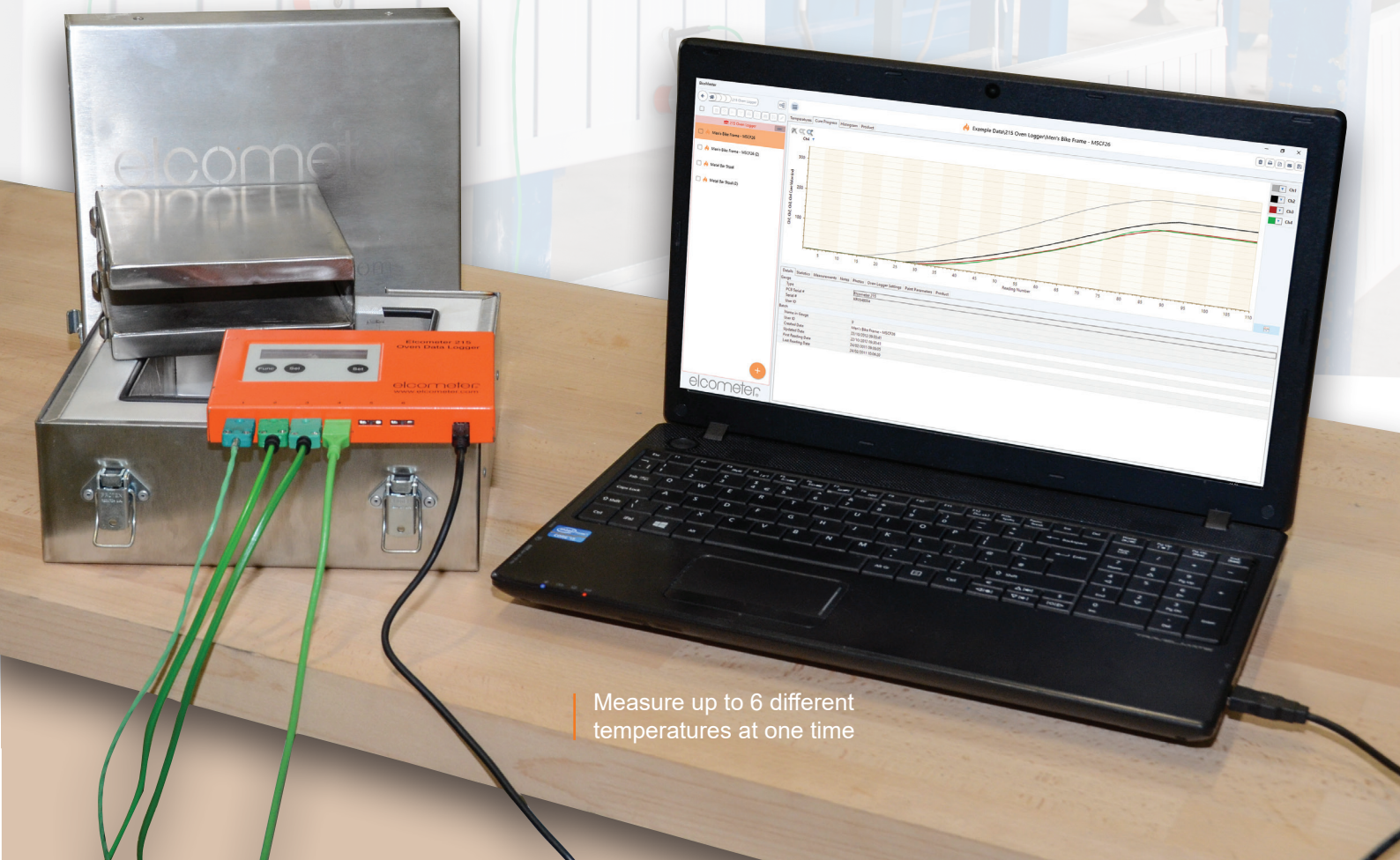
Incorrect oven temperature settings can lead to some or all of a product being too hot or too cold leading to under cure, coating burn, poor adhesion, discolouration, loss of gloss and other visible defects.

With a selection of magnetic or clamp type air & surface temperature probes, temperatures can be monitored both on or around the product and recorded by a data logger during the cure process. Once completed the measurement data can be transferred to the ElcoMaster® software to provide instant oven profile reports, process validation and much more.

Elcometer 215 Oven Data Logger

The **Elcometer 215** is the easy to use oven temperature profile solution, used to measure and store the temperature profiles of both the sample and the oven during the cure process.

- Large menu-driven display for easy operation
- Memory stores up to 260,000 readings
- Start and stop logging at a pre-set temperature
- Print full colour reports directly from the ElcoMaster® software
- Ideal in situations where powder coating thickness is inconsistent
- Ideal for testing powder or liquid coatings in batch or conveyor ovens
- Quick display shows maximum temperature, Cure-Index figure and pass/fail for each probe
- Variable measurement interval, date, time, °C / °F
- High temperature resistant teflon coated probe cables are easy to clean after each run
- Measure up to 6 different temperatures at one time

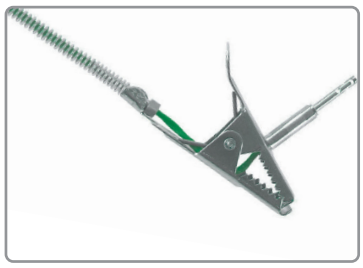


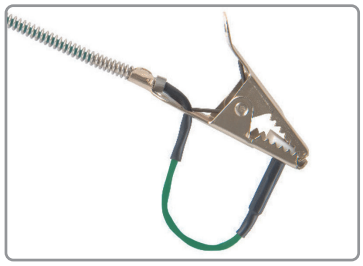
Elcometer 215

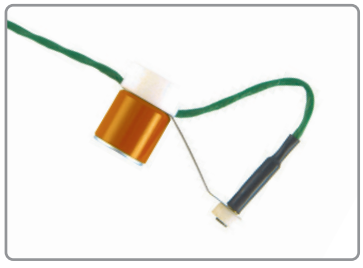
Oven Data Logger

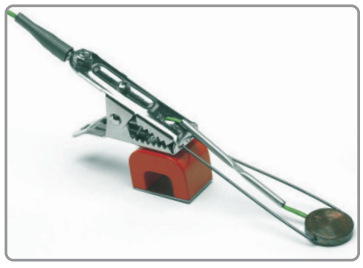
The logger display shows maximum temperature and Cure-Index figure, percentage and pass/fail, as a value or graphic representation for each probe.

Probes


Clamp air probe


Clamp surface probe


Magnetic surface probe


Combined clamp & magnetic surface probe


Probe ID Tags

Powerful

- Stores up to 260,000 readings
- USB data output to ElcoMaster® software, combines with other key inspection measurements

Efficient

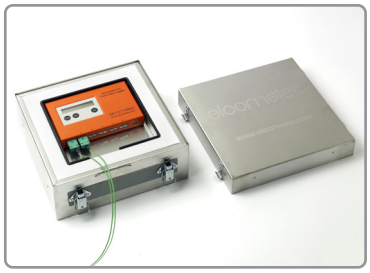
- Measure up to 6 different temperatures at one time
- Quick display shows maximum temperature, Cure-Index figure and pass/fail for each probe
- Start and stop logging at a pre-set temperature

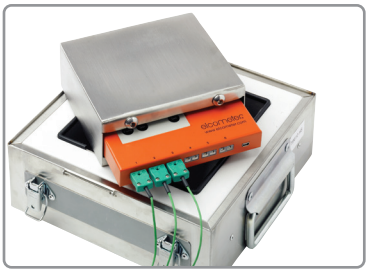
Rugged

- Standard thermal barrier kits - ideal for single runs
- High temperature barrier and heat sinks available for longer times at high temperature
- Wide range of K-type temperature probes with strong, highly flexible and easy to clean Teflon® coated cables

Flexible

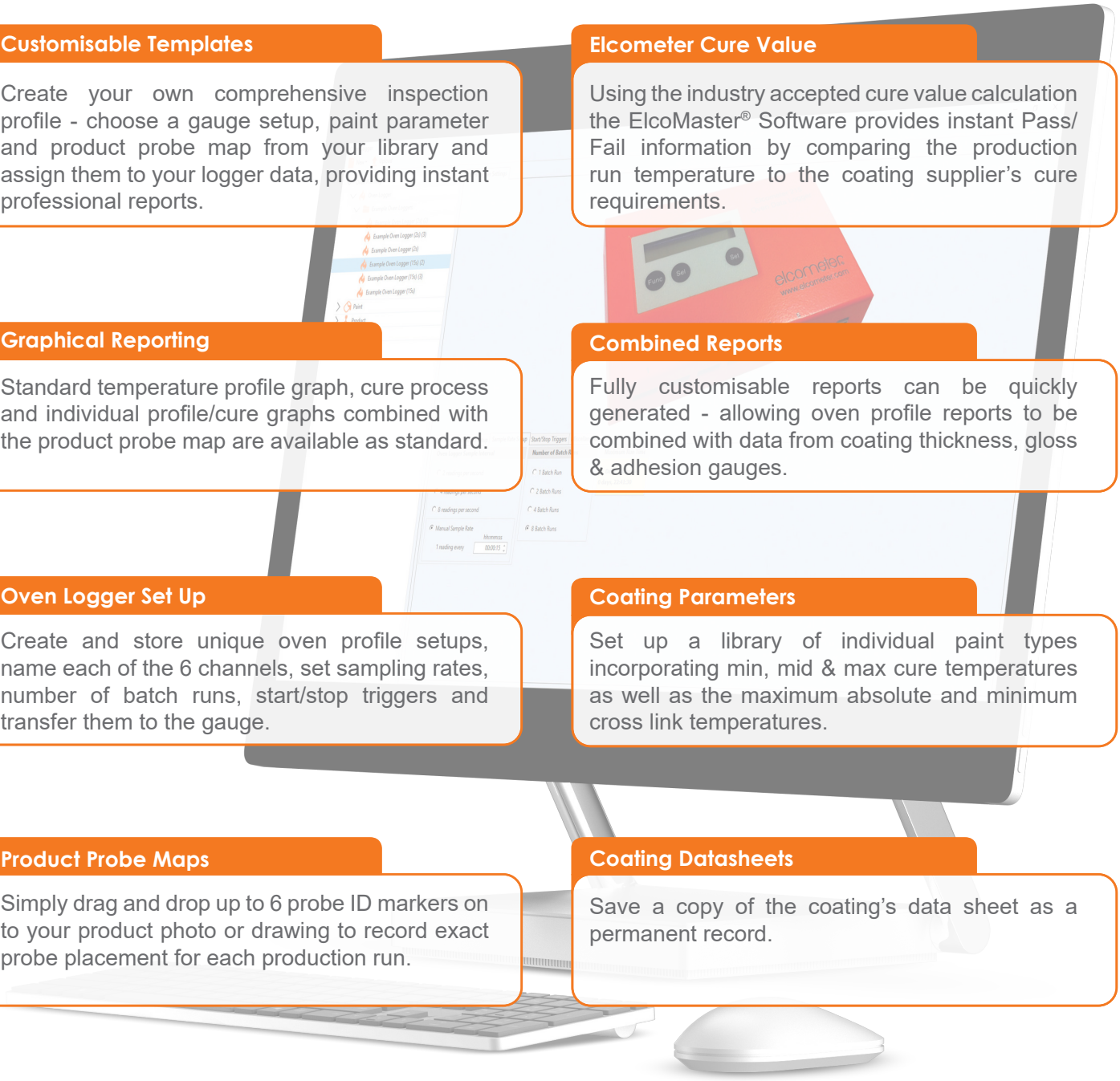
- Ideal for testing powder or liquid coatings in batch or conveyor ovens
- Variable measurement intervals, date, time, °C/°F


Standard Thermal Barrier Kit


High Temperature Barrier Kit

Elcometer 215 Oven Data Logger

ElcoMaster® is the easy to use software solution designed specifically for the management and assessment of your temperature profile, allowing you to generate professional inspection reports in seconds. Features include:



Customisable Templates

Create your own comprehensive inspection profile - choose a gauge setup, paint parameter and product probe map from your library and assign them to your logger data, providing instant professional reports.

Elcometer Cure Value

Using the industry accepted cure value calculation the ElcoMaster® Software provides instant Pass/Fail information by comparing the production run temperature to the coating supplier's cure requirements.

Graphical Reporting

Standard temperature profile graph, cure process and individual profile/cure graphs combined with the product probe map are available as standard.

Combined Reports

Fully customisable reports can be quickly generated - allowing oven profile reports to be combined with data from coating thickness, gloss & adhesion gauges.

Oven Logger Set Up

Create and store unique oven profile setups, name each of the 6 channels, set sampling rates, number of batch runs, start/stop triggers and transfer them to the gauge.

Coating Parameters

Set up a library of individual paint types incorporating min, mid & max cure temperatures as well as the maximum absolute and minimum cross link temperatures.

Product Probe Maps

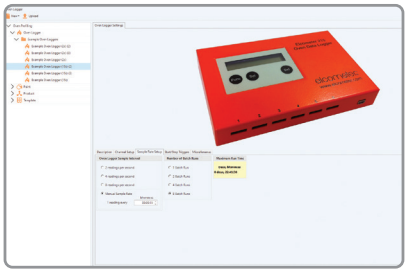
Simply drag and drop up to 6 probe ID markers on to your product photo or drawing to record exact probe placement for each production run.

Coating Datasheets

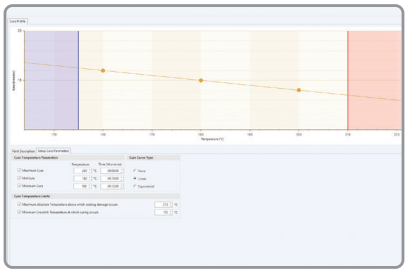
Save a copy of the coating's data sheet as a permanent record.

Elcometer 215

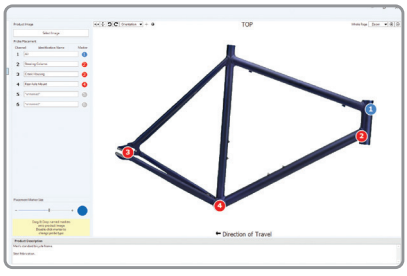
Oven Data Logger



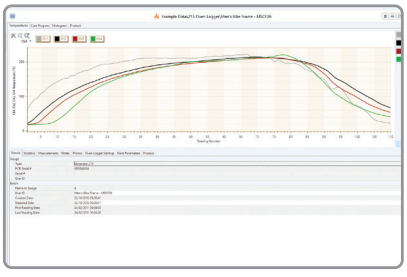
Create and store unique oven profile set ups and transfer them to the gauge.



Set up a library of individual paint parameters.



Individual product probe maps record the exact probe placement for each component.



Standard temperature profile and cure process graphs can be viewed at any time.



Statistical analysis by probe/channel.

Oven Logger Setup

Create and store unique oven profile setups and transfer them to the gauge.

Graphical Reporting

Standard temperature profile, cure process and product probe maps are available as standard.

Product Probe Maps

Place probe ID markers on your product photo or drawing to record exact probe placement for each production run.

Coating Parameters

Setup a library of individual paint types with min, mid and max cure temperatures.

Combined Reports

Oven profile reports can be combined with data from coating thickness, gloss & adhesion gauges.

Elcometer Cure Value

Instant pass/fail information compares the production run temperature to the coating supplier's cure requirements.

For more information on ElcoMaster® Software see page 17-2

Elcometer 215 Oven Data Logger

Technical Specification

Part Number	Description	Certificate
G215----2S	Elcometer 215 Oven Data Logger - Standard Thermal Barrier Kit	○
G215----2T	Elcometer 215 Oven Data Logger - High Temperature Thermal Barrier Kit*	○
Gauge Measurement Range	-200°C to 1300°C (-328°F to 2372°F)	
Gauge Operating Temperature	-30°C to 65°C (-22°F to 149°F) without thermal barriers	
Accuracy	5°C to 500°C: ±0.5°C (41°F to 932°F: ±1.0°F) >500°C: ±1.0°C (> 932°F: ±2.0°F)	
Resolution	0.1°C (0.2°F)	
Number of Channels	6	
Measuring Intervals	Adjustable from 8 per second to 1 per hour	
Memory	260,000 readings or 8 production runs	
Data Output	USB	
Power Supply	2 x AA batteries	
Gauge Dimensions	153 x 101 x 23mm (6 x 4 x 0.9")	
Gauge Weight	450g (15.8oz)	
Thermal Characteristics	Standard Thermal Barrier Kit	High Temperature Thermal Barrier Kit*
	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 300°C (572°F) for 30 minutes
Dimensions (in thermal barrier)	245 x 245 x 115mm (9.65 x 9.65 x 4.5")	
Weight (in thermal barrier)	4kg (8.8lb)	6kg (13.2lb)
Packing List	Elcometer 215 Oven Data Logger, thermal barrier (Model S), thermal barrier with heat sink block (Model T), ElcoMaster® software, USB cable, carry case, 2 x AA batteries and operating instructions	

Probes & Accessories

	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
Combined Magnetic Clamp Air & Surface Probe	T21521284	T21521285	T21521286
Probe Identification Tags (Pack of 6)			T21521241
Standard Thermal Barrier			T21521222
High Temperature Thermal Barrier for Elcometer 215 Model T (Heat Sink Block not included)			T21521217
Heat Sink Block for High Temperature Thermal Barrier			T21521219
Data Logger to PC USB Cable			T21521220

All probes have a continuous maximum temperature of 250°C (428°F).

○ Optional Calibration Certificate available.

* Includes Heat Sink


elcometer®

Hardness & Scratch Resistance



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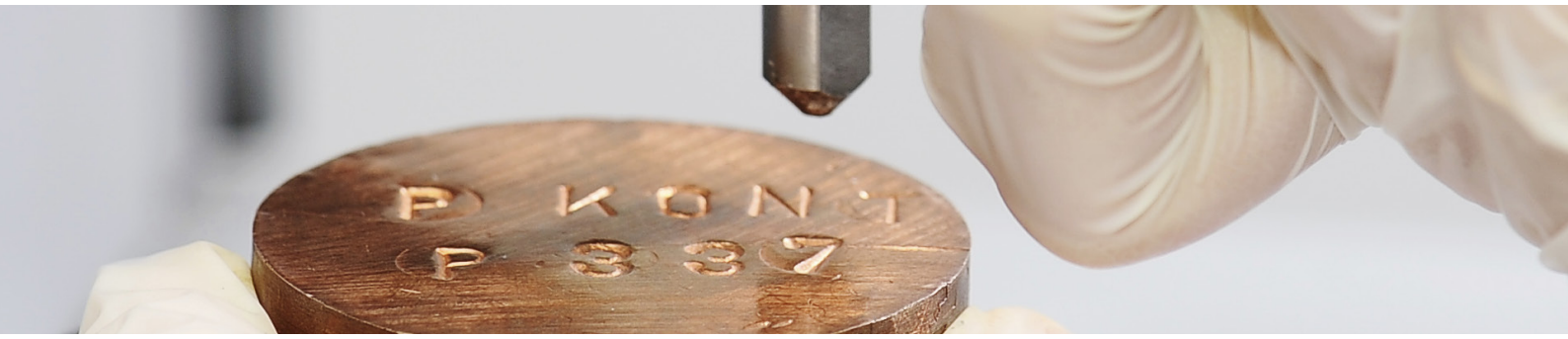


Hardness can be defined as a material's resistance to permanent deformation. In the coatings industry, hardness measurement can be used to determine the resistance of the coating to scratching from general wear and tear. It can also determine if a coating is fully cured.

Hardness: 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.

Scratch Resistance:

To assess a coating's resistance to scratch there are a number of different instruments that can be used:

- Pencil Hardness Tester (Wolff-Wilborn)
- Sclerometer
- Clemen Apparatus
- Scratching and Shearing Instrument

Resistance to Indentation:

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

Elcometer 3080

Pencil Hardness Tester







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

The pencil lead, sharpened 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, ECCA T4,
EN 13523-4, ISO 15184:2012,
JIS K 5600-5-4

etv video available elcometer.tv

Technical Specification

Part Number	Description
K0003080M203	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	Elcometer 3080 Pencil Hardness Tester, Pencil set - (14 x pencils, grades 6B - 6H), 2 x pencil sharpeners, abrasive paper block, storage stand 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)		
T99923040-1	Pencil Sharpener (6H to 2B)		
T99923040-2	Pencil Sharpener (3B to 6B)		

Elcometer 501

Pencil Hardness Tester







STANDARDS:
ASTM D 3363, ECCA T4,
EN 13523-4, ISO 15184:2012,
JIS K 5600-5-4

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, sharpened 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.

etv video available elcometer.tv

Technical Specification

Part Number	Description	Certificate
H501----1	Elcometer 501 Pencil Hardness Tester	○
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 x pencils, grades 6B - 6H), positioning block, 2 x pencil sharpeners, 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)		
T99923040-1	Pencil Sharpener (6H to 2B)		
T99923040-2	Pencil Sharpener (3B to 6B)		

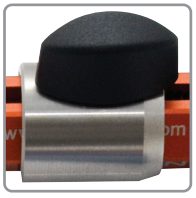
○ Optional Calibration Certificate available.

Elcometer 3092

Sclerometer Hardness Tester







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

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 to 30N is available to order separately.

etv video available elcometer.tv

Technical Specification

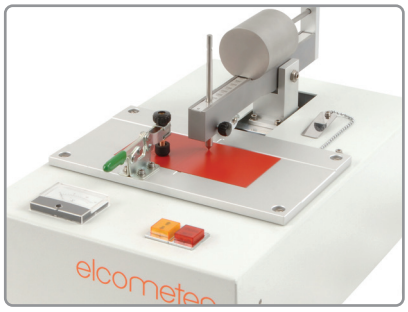
Part Number	Description
K0003092M201	Elcometer 3092 Sclerometer Hardness Testers - 3 ranges
Dimensions	165 x 24 x 16mm (6.5 x 1 x 0.6”)
Weight	370g (13oz)
Packing List	Elcometer 3092 Sclerometer, tool with 0.75mm (0.03”) diameter tungsten carbide tip, 3 springs (grey, red and blue), carry case and operating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

Accessories

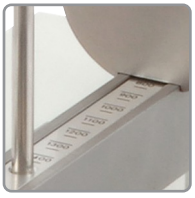
Part Number	Description
KT003092P001	0.5mm (0.02”) Tungsten Carbide Tip
KT003092P002	0.75mm (0.03”) Tungsten Carbide Tip
KT003092P003	1.0mm (0.04”) Tungsten Carbide Tip
KT003092P008	90° Diamond Point Cone, 90µm (3.54mils) Radius - ISO Type
KT003092P004	Grey Spring 0 - 3N (0 - 0.67lbF)
KT003092P005	Red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

Elcometer 3000

Motorised Clemen Unit







STANDARDS:
AS/NZS 1580.403.1, BS 3900-E2, DIN 53799, ECCA T12, EN 13523-12, ISO 1518-1:2019, JIS K 5600-5-5

The Elcometer 3000 Motorised Clemen Unit is a robust and accurate instrument for evaluating 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 a hemispherical tip of 1mm (0.04”) diameter (standard), lowered gradually on to the sample surface which is then pulled linearly 60mm (2.36”).

As the sample is pulled the tool lowers automatically on to the sample, moves along the sample and gently rises up at the end of the stroke.

To ensure consistent, repeatable and reproducible tests, the Motorised Clemen Unit automatically brings the tool gently in contact with the sample, moves across the coating and then lifts it with the automatic Start/Stop function. Depending on the load applied, varying degrees of penetration of the tool into the coating are observed - from a superficial trace to total destruction.

If the coating is completely removed during the test, the contact of the tool with the metallic substrate is indicated by a lamp and voltmeter indicator.

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

Technical Specification

Part Number	Description	Certificate
K3000M003	Elcometer 3000 Motorised Clemen Unit	○
Load Range	0 - 5kg (0 - 11lb)	
Sample Width	75 x 150mm (3 x 6”)	
Sample Thickness	Standard: 0.5 - 3mm (0.02 - 0.12”)	
	Extended*: 5 - 20mm (0.2 - 0.8”)	
Operating Temperature	5 to 40°C (41 to 104°F)	
Humidity Range	Not to exceed 80% relative humidity up to 31°C (88°F), decreasing linearly to 50% at 40°C (104°F).	
Dimensions	460 x 280 x 330mm (18 x 11 x 13”)	
Weight	20kg (44lb)	
Packing List	Elcometer 3000 Motorised Clemen Unit, 1kg weight (x 4), tungsten carbide ball tool; 1mm (0.04”), mains leads (UK, EUR and US) and operating instructions.	

Accessories

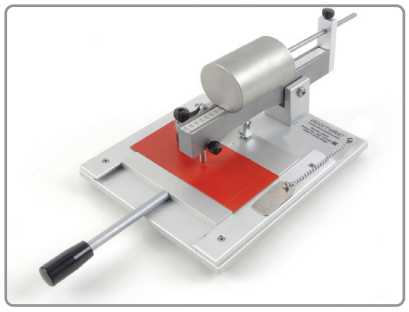
Part Number	Description
KT003000P021	1mm (0.04”) Ball Tool in Tungsten Carbide
KT003000N001	2mm (0.08”) Cutting Tool in Tungsten Carbide
KT003000N013	VW Cutting Tool
KT003000N015	Adjustment Kit to test from 5 to 20mm (0.02 to 0.8”)
KT007210M001	Illuminated Microscope (x30)
KT003025P007	Magnifier (x10)

* Using the optional Adjustment Kit

○ Optional Calibration Certificate available.

Elcometer 3000

Manual Clemen Unit



STANDARDS:
AS/NZS 1580.403.1, BS 3900-E2, DIN 53799, ECCA T12, EN 13523-12, ISO 1518-1:2019, JIS K 5600-5-5

The Elcometer 3000 Manual Clemen Unit is a robust and simple to use instrument for evaluating the resistance to scratching of a coated surface.

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

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

Technical Specification

Part Number	Description			Certificate
K0003000M001	Elcometer 3000 Manual Clemen Unit			○
Sample Width	75mm (2.95”)	Variable Load	0 - 2000g (70.5oz)	
Dimensions	410 x 200 x 155mm (16.1 x 7.9 x 6.1”)			
Weight	6kg (13.2lb)			
Packing List	Elcometer 3000 Manual, 1mm (0.04”) ball tool and operating instructions			

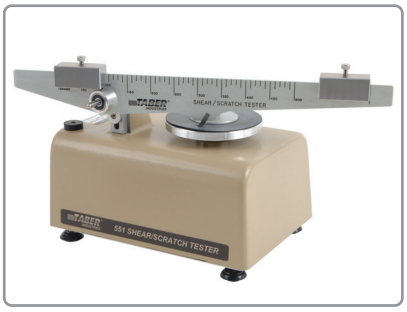
Accessories

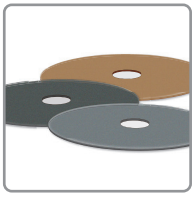
Part Number	Description
KT003000P021	1mm (0.04”) Ball Tool in Tungsten Carbide
KT003000N001	2mm (0.08”) Cutting Tool in Tungsten Carbide
KT003000N013	VW Cutting Tool
KT003000N015	Adjustment Kit to test from 5 to 20mm (0.02 to 0.8”)
KT007210M001	Illuminated Microscope (x30)
KT003025P007	Magnifier (x10)

○ Optional Calibration Certificate available.

Elcometer 3025

Scratch/Shear Tester







STANDARDS:
EN 438-2, ISO 4586-2

The motorised Elcometer 3025 tests the resistance of many materials to scratching, shearing, gouging, marring, scraping and engraving. This portable tester measures 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 coating or material hardness. The turntable rotates at a constant 5rpm to ensure repeatability and reproducibility of tests. By changing the load on the tool, from 0 to 1000g (0-2.2lb), the sample's scratch resistance 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.

Technical Specification

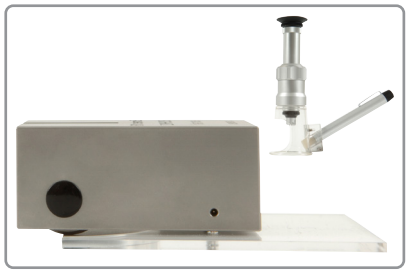
Part Number			Description
UK 240V	EUR 220V	US 110V	
K0UK3025M001	K0003025M001	K0US3025M001	Elcometer 3025 Scratch/Shear Tester
Dimensions	445 x 190 x 150mm (17 x 7.8 x 6")		
Weight	6.8kg (14.9lb)		
Packing List	Elcometer 3025 and operating instructions		

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)

Elcometer 3095

Buchholz Hardness Tester



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

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 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 provided.

etv video available elcometer.tv

Technical Specification

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, illuminated x20 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 mm	Indentation Resistance	Indentation Depth µm	Indentation Depth mils	Minimum coating thickness for which a measurement is valid µm	Minimum coating thickness for which a measurement is valid mils
0.8	125	5	0.2	15	0.59
0.85	118	6	0.24	20	0.79
0.9	111	7	0.28	20	0.79
0.95	105	7	0.28	20	0.79
1.0	100	8	0.31	20	0.79
1.05	95	9	0.35	20	0.79
1.1	91	10	0.39	20	0.79
1.15	87	11	0.43	25	1
1.2	83	12	0.47	25	1
1.3	77	14	0.55	25	1
1.4	71	16	0.63	30	1.18
1.5	67	18	0.71	30	1.18
1.6	63	21	0.83	35	1.38
1.7	59	24	0.94	35	1.38

○ Optional Calibration Certificate available.

Elcometer 3101

Barcol Impressor Hardness Tester







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

These easy to use hardness testers are ideal for testing the hardness of soft metals, plastics, glass fibre 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 aluminium and its alloys, brass, copper, glass fibre and some of the harder plastics. 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).

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; (x1)	87 - 89BU
KT003101P002	Certified Test Disc 934-1; (x5)	87 - 89BU
KT003101P203	Standard Test Disc 934-1; (x1)	43 - 48BU
KT003101P003	Certified Test Disc 934-1; (x5)	43 - 48BU
KT003101P204	Standard Test Disc 935; (x1)	87 - 89BU
KT003101P004	Certified Test Disc 935; (x5)	87 - 89BU
KT003101P205	Standard Test Disc 936; (x1)	43 - 48BU
KT003101P005	Certified Test Disc 936; (x5)	43 - 48BU

[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; 43 - 48 BU

Elcometer 3120

Shore Durometer







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

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 used 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.

Technical Specification

Part Number Without Certificate	With Certificate	Description	Certificate
K0003120M001	K0003120M015	Elcometer 3120 Shore Durometer A	○
K0003120M008	-	Elcometer 3120 Shore Durometer A with Max indicator	
-	K0003120M025	Elcometer 3120 Shore Durometer A with Max indicator and 10N weight	○
K0003120M005	K0003120M018	Elcometer 3120 Shore Durometer D	○
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	

Accessories

Part Number	Description
KT003120N002	Test Stand BS 61 II with 10N 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 →

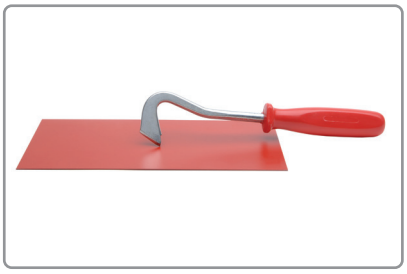
Shore A ASTM D2240, DIN 53505, ISO 868, ISO 7267-2

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

○ Calibration Certificate available under the separate part number listed.

Elcometer 1537

ISO Scratching Tool





STANDARDS:
BS 7479, EN 22063, ISO 2063,
ISO 7253, ISO 9227, NF A91-124

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 is available upon request.

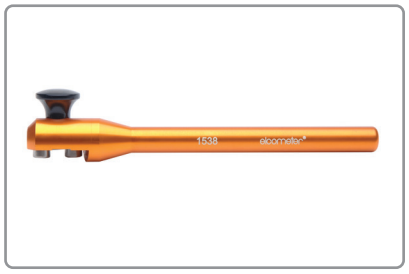
Technical Specification

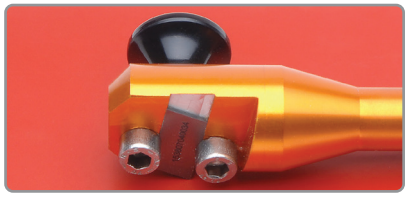
Part Number	Description	Certificate
K0001537M001	Elcometer 1537 ISO Scratching Tool	○
Dimensions	200 x 45 x 20mm (7.8 x 1.7 x 0.8”)	
Weight	100g (3.5oz)	
Packing List	Elcometer 1537 ISO Scratching Tool, operating instructions	

○ Optional Certificate of Conformity Available

Elcometer 1538

DIN Scratching Tool





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.

An adjustment device to ensure accurate setting of the blade is available as an optional accessory.

STANDARD:
BS EN ISO 4628-8:2012, DIN 53167, DIN EN ISO 4628-8:2012

Technical Specification

Part Number	Description
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

Accessories

KT001538N002	Spare 0.5mm (0.02”) Cutter	KT001538N001	Spare 1mm (0.04”) Cutter
KT001538M103	Blade Adjustment Device		





Elasticity & Deformation

11



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 perform fewer tests to achieve similar results 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.

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.

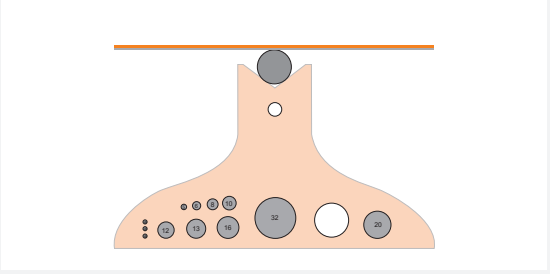
Coated metal sheets, maximum 150mm (5.9”) in length x 100mm (3.93”) wide, are manually and successively bent around mandrels of decreasing diameter until cracks appear.

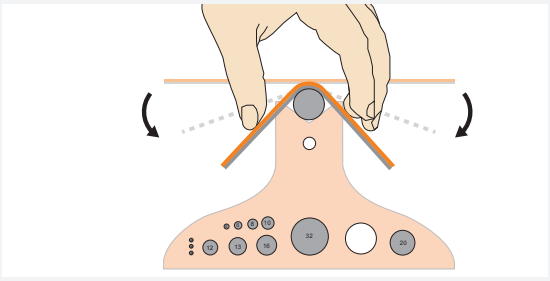
STANDARDS:
AS/NZS 1580.402.1, ASTM D 2485, ASTM D 522-B, ASTM D 1737, BS 3900-E1, DIN 53152, ISO 1519-1, JIS K 5600-5-1, NF T30-040

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) **or** set of 13 mandrels (Elcometer 1500/2) and operating instructions

How to use the Cylindrical Mandrel on a Stand

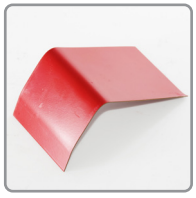




Elcometer 1506

Cylindrical Mandrel Bend Tester







STANDARDS:
AS/NZS 1580.402.1, ASTM D 2485, ASTM D 522-B, ASTM D 1737, ISO 1519-2, JIS K 5600-5-1

The Elcometer 1506 Cylindrical Mandrel 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 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.

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

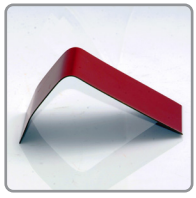
Accessories

KT001506P201	Elcometer 1506 Metric Mandrel Set, 2 to 32mm (one of each of the Metric Mandrels, as listed below)		
KTUS1506P201	Elcometer 1506 Imperial Mandrel Set, ⅛ to 1” (one of each of the Imperial Mandrels, as listed below)		
	Metric		**Imperial**
KT001506F002	2mm Mandrel	KTUS1506F022	⅛” Mandrel
KT001506F003	3mm Mandrel	KTUS1506F023	¼” Mandrel
KT001506F004	4mm Mandrel	KTUS1506F024	⅜” Mandrel
KT001506F005	5mm Mandrel	KTUS1506F025	½” Mandrel
KT001506F006	6mm Mandrel	KTUS1506F026	⅝” Mandrel
KT001506F007	8mm Mandrel	KTUS1506F027	¾” 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		

Elcometer 1510

Conical Mandrel Bend Tester







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

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 to 38.1mm (0.12 - 1.5”). A graduation indicates the mandrel diameter in both millimetres and inches.

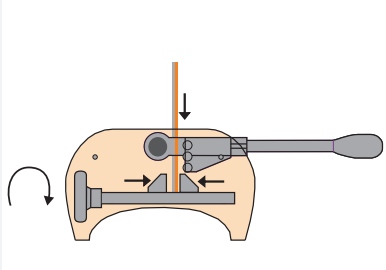
The specimen can be bent on part of, or along, the entire length of the mandrel, and the results (cracks) corresponding to different test diameters can be observed in a single operation. This is ideal for use in conjunction with the cylindrical mandrel, as it identifies the stop point for more focused 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 a long service life. A large, sturdy anodised base, which can be permanently fixed to a workstation, ensures stability during testing.

Technical Specification

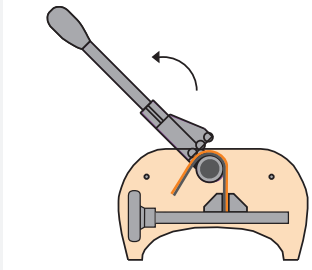
Part Number	Description	Certificate
K0001510M001	Elcometer 1510 Conical Mandrel Bend Tester	○
Diameter Range	3.2 - 38.1mm (0.1 x 1.5”)	
Sample Size	180 x 100 x 0.8mm (7 x 4 x 0.03”)	
Dimensions	325 x 350 x 100mm (12.8 x 13.8 x 4”)	
Weight	9kg (20lb)	
Packing List	Elcometer 1510 Conical Mandrel Bend Tester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

How to use a Cylindrical Mandrel Bend Tester



Insert a 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 coating for damage.

Repeat as necessary with smaller diameter mandrels.

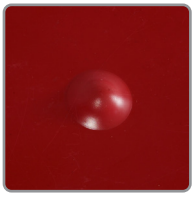
○ Optional Calibration Certificate available.

Elcometer 1620

Cupping Tester







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

This robust and user-friendly tester is 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 illuminated x10 magnifying glass.

Technical Specification

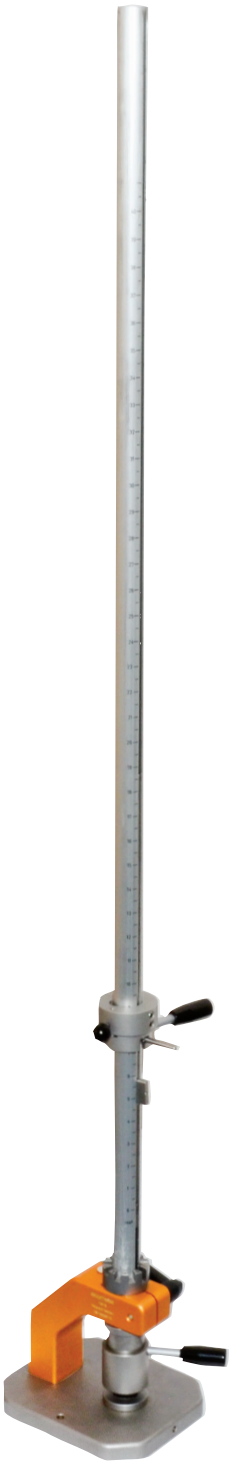
Part Number	Description	Gauge Type	Certificate
K0001620M004	Elcometer 1620/4 Manual Cupping Tester	Digital (mm, mils)	○
Dimensions	300 x 240 x 500mm (12 x 10 x 20”)		
Weight	24kg (53lb)		
Packing List	Elcometer 1620 Cupping Tester, gauge, gauge holder, zero setting sheet, illuminated x10 magnifying glass with magnet and operating instructions		

○ Optional Calibration Certificate available.

Elcometer 1615 Variable Impact Tester

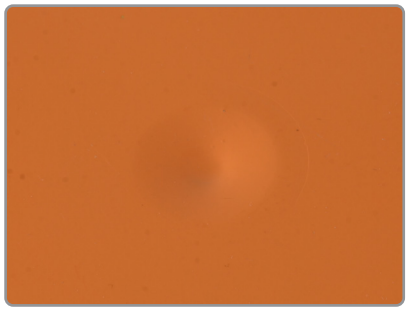
The **Elcometer 1615** Variable Impact Tester is a simple to use gauge ideal for evaluating the resistance of a coating to impact (elongation, cracking or peeling).

- Stop collar with 10 settings to change the depth of impact when working in accordance with ISO Standards, supplied with Kits A, D and F
- Integrated bubble level to ensure the tester is perpendicular for repeatable accurate results
- Comes as one universal assembly with the option of six different kits
- Quick, safe weight release mechanism
- Magnifier x10
- Easy to 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
- Graduated tube engraved in both kg-cm & lb-inch (1m, 39” height) Metric and Imperial units
- Heavy-duty, passivated base plate and anodised arm to prevent rusting
- Tube height 1,000mm (39”)



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

For impact tester kits, see page 11-9



A panel after being tested by the Elcometer 1615.

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 designed to meet a wide range of National and International Standards. The Elcometer 1615 is suitable for use on both direct and indirect methods:

- Direct: A weight with a hemispherical punch attached falls on to 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 seven 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, (for more information see page 11-9) and attach the punch, die and accessories to the base unit.

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.

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



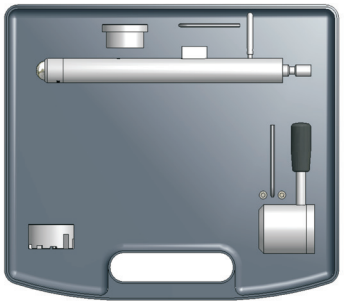
Technical Specification

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, magnifier (x6), 4mm Allen key, operating instructions and carry case

Elcometer 1615

Elcometer Impact Tester Kits

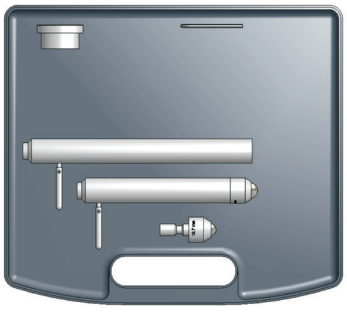
In order to test a sample in accordance with a specified Standard, a number of kits have been created to provide a single impact tester which, by using the appropriate kit, allows the user to work in accordance with a wide range of National and International Standards.



Part Number	Description	Certificate
KT001615KITA	Elcometer Impact Tester Kit A	○

Kit A: Falling 1kg (2.2lb) weight with a 20mm (0.79”) punch; 27mm (1.06”) die with fixing screw; sample clamp with two fixing screws; stop collar*; 3mm (0.12”) and 4mm (0.16”) hexagonal wrench

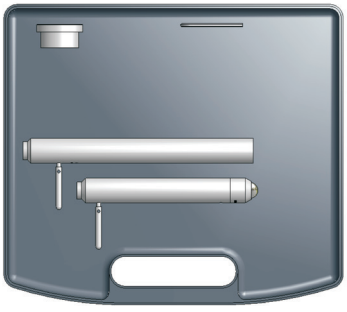
STANDARDS:
ISO 6272:1993, EN 13523, JIS K 5600-5-3, DIN EN ISO 6272-1



Part Number	Description	Certificate
KT001615KITB	Elcometer Impact Tester Kit B	○

Kit B: Falling 1kg (2.2lb) weight with static indenter with 15.9mm (0.6”) punch; 12.7mm (0.5”) punch; 16.3mm (0.64”) die with fixing screw; 3mm (0.12”) hexagonal wrench

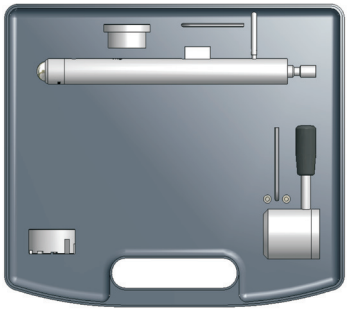
STANDARDS:
ASTM D 2794, BS EN ISO 6272-2, ISO 6272-2 :2002, Qualicoat



Part Number	Description	Certificate
KT001615KITC	Elcometer Impact Tester Kit C	○

Kit C: Falling 2lb (908g) weight with static indenter with 15.9mm (0.6”) punch; 16.3mm (0.64”) die with fixing screw; 3mm (0.12”) hexagonal wrench

STANDARDS:
ASTM D 2794, BS6496:1984, EN 12206-1, ASTM D 5420



Part Number	Description	Certificate
KT001615KITD	Elcometer Impact Tester Kit D	○

Kit D: Falling 1kg (2.2lb) weight with 20mm (0.79”) punch and stop key; 27mm (1.06”) die with fixing screw; stop collar*; sample clamp with fixing screws; 3mm (0.12”) and 4mm (0.16”) hexagonal wrench

STANDARDS:
ISO 6272-1, BS EN ISO 6272-1, NF EN ISO 6272-1

* 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”)
○ Optional Calibration Certificate available.

Elcometer 1615

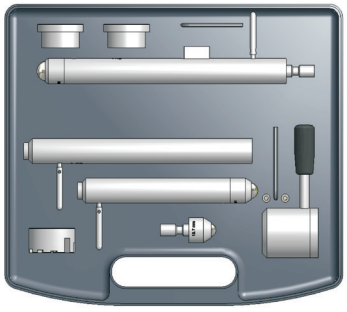
Elcometer Impact Tester Kits



Part Number	Description	Certificate
KT001615KITE	Elcometer Impact Tester Kit E	○

Kit E: Falling 400g (0.9lb) weight with 23mm (0.90”) punch; 22mm (0.87”) die with fixing screw; 3mm (0.12”) hexagonal wrench

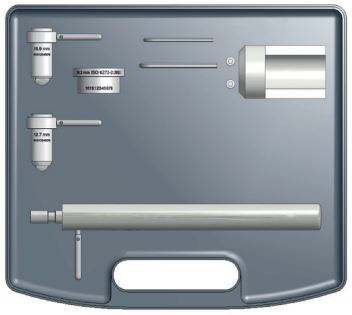
STANDARDS:
NF T30-017:1989



Part Number	Description	Certificate
KT001615KITF	Elcometer Impact Tester Kit F	○

Kit F: Falling 1kg (2.2lb) weight with a 20mm (0.79”) punch; 27mm (1.06”) die with fixing screw; Falling 1kg (2.2lb) weight with 12.7mm (0.5”) punch; sample clamp with two fixing screws; 16.3mm (0.64”) die with fixing screw; stop collar*; static indenter with 15.9mm (0.6”) punch; 3mm (0.12”) hexagonal wrench; 4mm (0.16”) hexagonal wrench

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

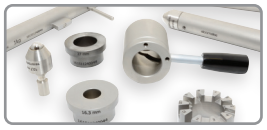


Part Number	Description	Certificate
KT001615KITG	Elcometer Impact Tester Kit G	○

Kit G: Falling 1kg (2.2lb) weight with a 15.9mm (0.62”) static indenter with handle and punch; 12.7mm (0.5”) static indenter with handle and punch; 16.3mm (0.64”) die with fixing screw; guide bracket with two fixing screws; 3mm (0.12”) hexagonal wrench; 4mm (0.16”) hexagonal wrench

Additional 1kg (2.2lb) weights are available as an optional extra.

STANDARDS:
BS EN ISO 6272-2:2011



For a full range of kits, dies and other accessories to meet a wide range of National and International Standards see page 11-11

○ Optional Calibration Certificate available.

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

		Suitable for Kit						
		A	B	C	D	E	F	G
KT001615N201	1kg (2.2lb) Falling Weight, 24.6mm (0.97") Diameter				■			
KT001615N221	1kg (2.2lb) Falling Weight, 25.0mm (0.98") Diameter	■					■	■
KT001615N226	20mm (0.79") Diameter Punch (Outside Diameter 25mm)	■					■	
KT001615N215	12.7mm (0.5") Diameter Punch		■				■	
KT001615N205	15.9mm (0.6") Diameter Punch		■	■			■	
KT001615N206	20mm (0.79") Diameter Punch (Outside Diameter 24.6mm)				■			
KT001615N207	23mm (0.9") Diameter Punch					■		
KT001615N216	Static Indenter with 12.7mm/0.5" Diameter Punch							■
KT001615N217	Static Indenter with 15.9mm/0.6" Diameter Punch							■
KT001615N208	Stop Ring Collar	■			■		■	
KT001615N209	Sample Clamp Mechanism	■			■		■	
KT001615N210	Weight Release Mechanism	■	■	■	■	■	■	■
KT001615N211	Replacement Graduated Tube	■	■	■	■	■	■	■
KT001615N212	16.3mm (0.64") Die		■	■			■	
KT001615N232	16.3mm (0.64") Die (with 1.5mm Radius)							■
KT001615N213	22mm (0.87") Die					■		
KT001615N214	27mm (1.06") Die	■			■		■	


elcometer®



Adhesion

12



From the largest commercial aircraft 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: simple to use, quantitative range giving a definitive adhesion value, ideal for the laboratory 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: 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: 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.

Elcometer 510 Automatic Pull-Off Adhesion Tester

The **Elcometer 510** Automatic Pull-Off Adhesion Tester accurately measures the strength of the bond between the coating and the substrate.



Fully adjustable pull rates 0.1-1.4MPa/s (15-203psi) to meet National and International Standards

User definable limits with unique pressure hold and release function

User definable measurement range with an accuracy of ±1% of full scale:
10mm dolly: 100MPa / 14,400psi
14.2mm dolly: 50MPa / 7,200psi
20mm dolly: 25MPa / 3,600psi
50mm dolly: 4MPa / 580psi

Store up to 60,000 readings with individual pull graphs in up to 2,500 alpha numerical batches, complete with attribute failure information

Intuitive & easy to use menu structure in multiple languages

10, 14.2, 20 and 50mm diameter dolly options

Automatic hydraulic pump ensures smooth and continuous pressure application for consistent, repeatable results

STANDARDS:
ASTM C1583, ASTM D4541, ASTM D7234-12, AS/NZS 1580.408.5, BS 1881-207, DIN 1048-2, EN 1015-12, EN 12636, EN 13144, EN 1542, EN 24624, ISO 16276-1, ISO 4624, JIS K 5600 5-7, NF T30-606, NF T30-062

Elcometer 510

Automatic Pull-Off Adhesion Tester



Range of reusable dollies and skirts ideal for thin substrates

Efficient

- Ideal for laboratory use
- 10, 14.2, 20 and 50mm (0.39, 0.56, 0.76 & 1.96") diameter reusable dollies
- Compatible with ElcoMaster® Software and ElcoMaster® Mobile App
- Measures on small, curved and flat surfaces



USB and Bluetooth® data output, compatible with ElcoMaster® Software

Powerful

- Suitable for use on metal, wood, concrete and other substrates
- Smooth load application up to 100MPa (14,400psi)
- USB and Bluetooth® data output to iOS† or Android™ devices
- Stores up to 60,000 readings in 2,500 batches



Sealed, heavy duty and impact resistant

Durable

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP64



An accuracy of ±1% of full scale

Accurate

- Measurement range up to 100MPa (14,400psi) with an accuracy of ±1% of full scale
- Can be used in accordance with National & International Standards

2 YEAR* WARRANTY

etv video available elcometer.tv

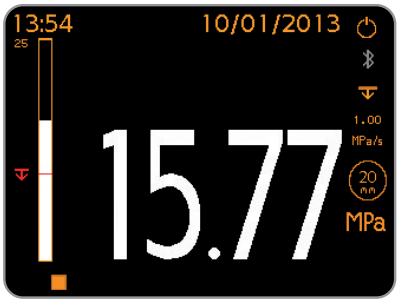
* The Elcometer 510 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

† Compatible with iPod, iPhone and iPad.

Elcometer 510 Automatic Pull-Off Adhesion Tester

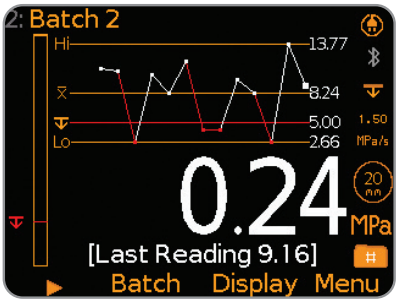
Key Features

Selectable Pull Rates



Automatic adhesion tester with selectable pull rates for 10, 14.2, 20 & 50mm diameter dollies.

Graphs & Statistics



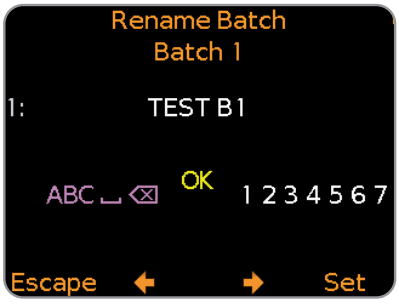
View trend graphs or live statistics alongside the reading value.

Pull Rate Graphs



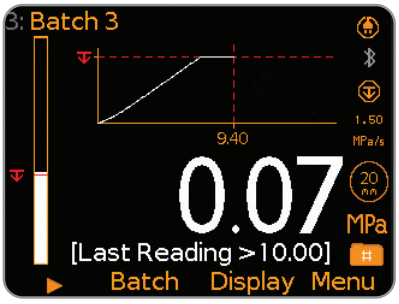
Individual user definable pull rate graphs can be saved with each reading.

Memory



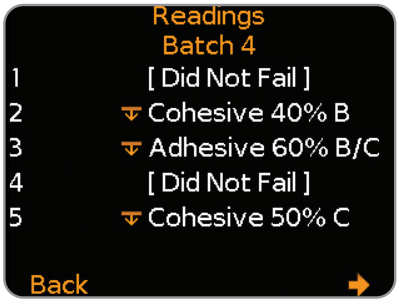
Stores individual readings and pull rate graphs in up to 2,500 alphanumeric batches, together with the date, time and attribute information.

Limits



Either pull to maximum or pull to preset limit. Unique time hold feature allows users to set a delay before pressure returns to zero.

Failure Attributes



Save cohesive and adhesive failure attributes alongside your adhesion pull data in accordance with National and International Standards.

Testing Coatings on Low Bond Strength Substrates

When testing coatings on low bond strength substrates such as concrete, wood or other fibrous materials, a larger surface area of dolly (50mm) is required to provide accurate, repeatable and reproducible results.

The Elcometer 510 is available as a Concrete Adhesion Tester Kit, or 50mm concrete accessory items (skirt, dolly, cutter) can be added to existing Elcometer 510 pull-off adhesion kits.



Elcometer 510 Automatic Pull-Off Adhesion Tester

Key Features

Long Battery Life



Powered by either standard rechargeable batteries or AC mains*. Each battery charge performs up to 200 pulls. Battery recharge time <300 minutes.

Robust Case



Supplied in a robust plastic carry case for easy transportation to and around the job site.

Anchor Clamp



The optional magnetic anchor clamp ensures the actuator doesn't fall during tests on vertical surfaces or testing at height.

Range of Dollies



Ideal for testing on thin substrates, the Elcometer 510 interchangeable substrate skirt adaptors allow each gauge to be used with 10, 14.2, 20 or 50mm diameter reusable dollies, ideal for testing coatings on thin, thick, flat or convex substrates.

Wireless



Using wireless Bluetooth® communication, link the gauge to an Android™ or iPhone mobile device. Live GPS coordinates from your mobile device can be added to reports and emailed instantly.

Data Management



Transfer data to your PC via USB or Bluetooth® for further analysis with ElcoMaster® software or view live pull rate graphs in ElcoMaster® Software during the test.

* Model T only.

Elcometer 510 Automatic Pull-Off Adhesion Tester

Assessing The Results - Failure Attributes

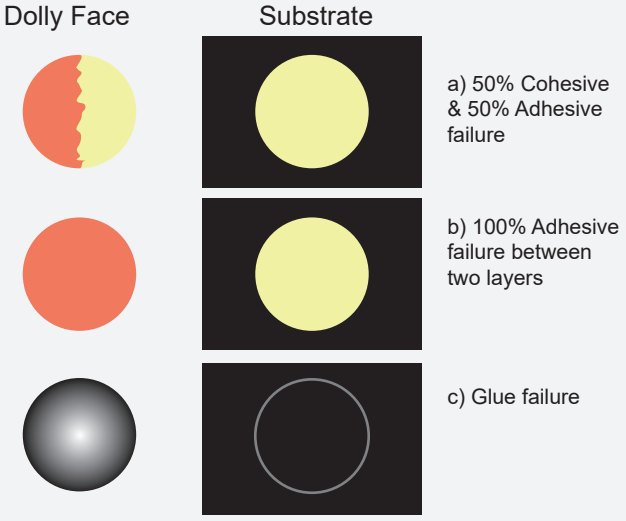
Many National and International Standards, including ISO 4624 & ASTM D4541, require the user to record not only the pull-off force but also the nature of the failure. This is done by examining the bottom of the dolly and assessing the failure. In 'Advanced' Mode on the Elcometer 510 it is possible to select the 'Attributes' feature (Menu/Set up/Gauge Mode/Advanced) allowing the nature of the fracture to be recorded against each reading and stored within the batch.

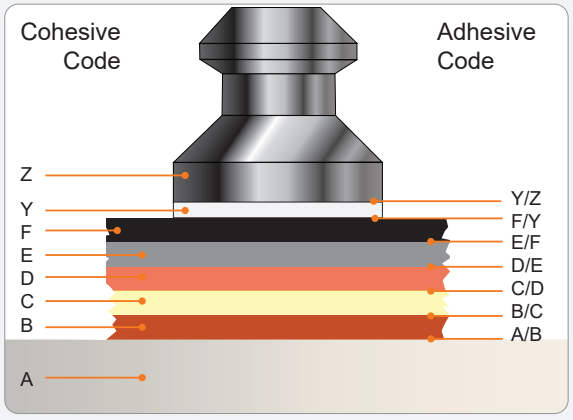
Examining The Dolly

a) Cohesive Failure: The coating fails within the body of a coating layer leaving the same coating on the surface and on the dolly face.

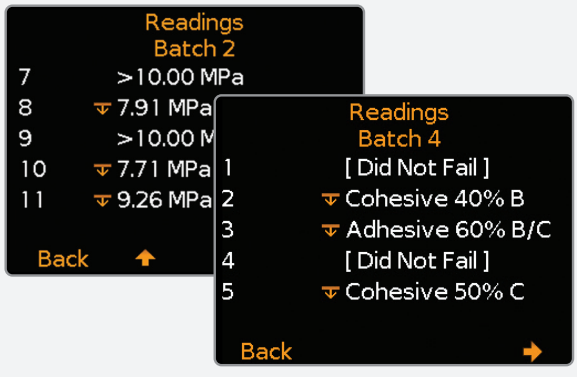
b) Adhesive Failure: Failure occurs at the interface between layers (intercoat) where one pulls away from the other. The "coating" on the dolly face will not be the same as that on the test area.

c) Glue Failure: When no coating is present on the dolly it must be recorded as a failure of the glue. This may be due to incorrect or insufficient mixing of the component parts of the adhesive, incompatibility between the adhesive/coating/dolly/test surface.





Cohesive Failure Layer[1]		Adhesive Failure Layers	
Code	Description	Code	Description
A	Substrate	A/B	Substrate & Layer 1
B	Layer 1	B/C	Layer 1 & Layer 2
C	Layer 2	C/D	Layer 2 & Layer 3
D	Layer 3	D/E	Layer 3 & Layer 4
E	Layer 4	E/F	Layer 4 & Layer 5
F	Layer 5	F/Y	Layer 5 & Glue
Y	Glue	Y/Z	Glue & Dolly



The data is saved in the batch and can be viewed at any time displayed as

##.## MPa[2] **N% A, M% A/B**, where;

##.## MPa[2]	= Pull Force in MPa or other measurement units (psi, Newtons or Nmm^{-2})
N%	= Cohesive failure percentage[3]
A	= Cohesive failure layer
M%	= Adhesion failure percentage[3]
A/B	= Intercoat adhesive failure layers

[1] The number of layers can be user defined for each batch via Batch/New Batch/Number of Layers. This will affect the number of layers available for selection during attribute recording. The maximum number of layers available is five, excluding the substrate and glue.

[2] Or equivalent units. [3] To the nearest 10%, in line with International Standards.

Elcometer 510 Automatic Pull-Off Adhesion Tester

Create instant reports with ElcoMaster® Software

What you do with the collected data is just as important as taking the readings themselves.



ElcoMaster® Software is a fast, easy to use software solution for all your data management and quality assurance needs, preparing professional inspection reports at the click of a button.

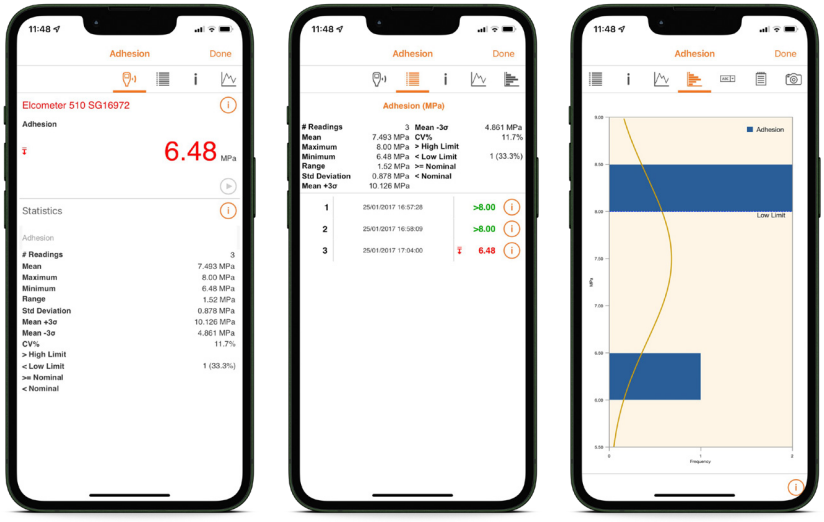
Whether you are out in the field or on the factory floor, using the ElcoMaster® Software Mobile App users can;

- Store live readings directly on to a mobile device and save them into batches.
- View the pull rate graph in real-time for the duration of the test.
- Add attribute data to each individual batch reading.
- Add photographs of the dolly and test surface to each individual batch reading at the click of a button.
- Plot individual readings on to a location map, photograph or diagram.
- Inspection data can be transferred from mobile to PC for further analysis and reporting.
- Generate instant .pdf report for submission.

Combine different inspection parameters (such as dry film thickness, surface profile, salt contamination, climate or adhesion) together with images, notes and other project specific information into customised reports.

Data transferred from the gauge to ElcoMaster® Software includes;

- Adhesion Measurements
- Date & Time
- Cohesive/Adhesive Failure Attributes
- Dolly size
- Pull rate graph
- Pull to Limit/Max
- Limit values
- Limit Hold Time
- Cutting Device
- Number of Layers
- Skirt Type/Support Ring Dimensions
- Batch Information & Statistics
- Calibration Information
- Calibration Verification Date/Time



Elcometer 510 Automatic Pull-Off Adhesion Tester

Product Features	■ Standard □ Optional	
	Model S	Model T
Repeatable & reproducible measurements	■	■
Easy to use menu structure; *in multiple languages*	■	■
Tough, impact, waterproof & dust resistant; *equivalent to IP64*	■	■
Bright LCD colour screen; *with ambient light sensor*	■	■
Scratch & solvent resistant display; *2.4" (6cm) TFT*	■	■
Calibration certificate	■	■
2 year gauge warranty[1]	■	■
Automatic rotating display; *0°, 180°*	■	■
Data output via USB (Live readings - and batch)	■	■
Data output via Bluetooth®		■
PC command; *start & stop gauge from a PC with live readings (USB only)*		■
Switchable Units (MPa, psi, N, Nmm^{-2})	■	■
On Screen Statistics (*η, x̄, σ, Hi, Lo, CV%, N>hi limit*[2])	■	■
Pull Rate Indicator	■	■
Trend Graph	■	■
Pull Rate Graph *(Load v Time)*		■
Interchangeable Dolly Selection; *10, 14.2, 20 & 50mm*	■	■
User Selectable Pull Rates; (Model S & Model T Standard Mode) *10mm: 1.00, 2.00, 3.00, 4.00, 5.00MPa/s 125, 200, 400, 600, 725psi/s* *14.2mm: 0.4, 0.7, 1.4, 2.0, 2.5MPa/s 60, 100, 200, 300, 360psi/s* *20mm: 0.2, 0.3, 0.7, 1.0, 1.2MPa/s 30, 50, 100, 150, 180psi/s* *50mm: 0.04, 0.08, 0.12, 0.16, 0.20MPa/s 5, 8, 16, 24, 30psi/s*	■	■
User Selectable Pull Rates; (Model T Advanced Mode) *10mm: 0.40 - 5.60MPa/s 58 - 812psi/s in 0.1MPa / 1psi steps* *14.2mm: 0.20 - 2.80MPa/s 29 - 403psi/s in 0.1MPa / 1psi steps* *20mm: 0.10 - 1.40MPa/s 15 - 203psi/s in 0.1MPa / 1psi steps* *50mm: 0.02 - 0.22MPa/s 2 - 32psi/s in 0.01MPa / 0.1psi steps*		■
User Selectable Limit & Limit Hold Time		■
Gauge Memory; *maximum number of readings*	60	60,000[3]
Number of Batches *(Alpha Numeric - Model T)*	1	2,500
Attribute Modes to meet National & International Standards		■
Display Modes		
Readings, Selected Stats & Run Chart (last 20 readings)	■	■
Pull Rate Graphs		■
Batch Review		■
Power; *Battery (B), AC Mains Power (M)*	B	B, M
USB Cable & ElcoMaster® Software CD	■	■
Power Cable with Multi International Plug Adaptor *(UK, EU, US, AUS)*		■
Plastic Transit Case	■	■
Date & Time		■
In Field Adhesion Calibration Verification Mode	■	■

[1] The Elcometer 510 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. [2] Model T only. [3] When 'Rate Graph' is enabled, the number of readings which can be stored depends on the graph resolution selected.

Elcometer 510 Automatic Pull-Off Adhesion Tester

Technical Specification

Part Number	Description			Certificate
F510-20S	Elcometer 510 Model S Automatic Adhesion Tester; 20mm Kit			●
F510-20T	Elcometer 510 Model T Automatic Adhesion Tester; 20mm Kit			●
F510-50S	Elcometer 510 Model S Automatic Adhesion Tester; 50mm Concrete Kit			●
F510-50T	Elcometer 510 Model T Automatic Adhesion Tester; 50mm Concrete Kit			●
Pressure Accuracy	±1% of full scale	Pull Rate Accuracy	±(2.5% + 0.3 seconds)	
Pressure Resolution	0.01MPa (1psi)	Pull Rate Resolution	0.01MPa/s (1psi/s)	
Dolly Diameter	**10mm (0.39")**	**14.2mm (0.56")**	**20mm (0.76")**	**50mm (1.96")**
Operating Range	8 - 100 MPa (1200 - 14400psi)	4 - 50 MPa (600 - 7200psi)	2 - 25 MPa (300 - 3600psi)	0.3 - 4 MPa (50 - 580psi)
Pull Rate Range	0.4 - 5.6MPa/s (58 - 812psi/s)	0.2 - 2.8MPa/s (29 - 403psi/s)	0.1 - 1.4MPa/s (15 - 203psi/s)	0.02 - 0.22MPa/s (2 - 32psi/s)
Gauge Dimensions	260 x 100 x 66mm (6.3 x 3.9 x 2.6")			
Actuator Height[1]	85mm (3.4")	85mm (3.4")	85mm (3.4")	110mm (4.3")
Instrument Weight[1]	2.9kg (6.4lb)	2.9kg (6.4lb)	2.9kg (6.4lb)	3.1kg (8.3lb)
Kit Weight	-	-	6.1kg (13.5lb)	7.3kg (16.1lb)
Power Supply	8 x AA batteries (16 rechargeable batteries supplied complete with charger) or AC mains power (Model T only)			
Battery Life	~200 pulls per charge up to 25MPa (3600psi) at 1MPa/s (150psi/s), recharge time <5 hours			
Packing List: 20mm Kit	Elcometer 510 Adhesion Tester with 20mm dollies (x10), standard skirt for 20mm dollies, 20mm dolly cutter handle, 20mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, shoulder harness, carry case, 16x AA NiMH rechargeable batteries & charger (UK, EU, US, AUS), mains power supply (UK, EU, US, AUS) (Model T), ElcoMaster® Software CD & USB cable, calibration certificate and operating instructions.			
Packing List: 50mm Kit	Elcometer 510 Adhesion Tester with 50mm dollies (x6), standard skirt for 50mm dollies, 50mm dolly cutter arbor, 50mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, shoulder harness, carry case, 16x AA NiMH rechargeable batteries & charger (UK, EU, US, AUS), mains power supply (UK, EU, US, AUS) (Model T), ElcoMaster® Software CD & USB cable, calibration certificate and operating instructions.			

Accessories

Dolly Diameter	Pack of 10[2]	Pack of 100	Standard Skirt	Thin Substrate Skirt	Cutter Handle/ Arbor	Dolly Cutter
10mm (0.39")	T5100010AL-10	T5100010AL-100	T9991420S	-	-	-
14.2mm (0.56")	T9990014AL-10	T9990014AL-100	T9991420S	T9990014T	T9991420H	T9990014CT
20mm (0.76")	T9990020AL-10	T9990020AL-100	T9991420S	T9990020T	T9991420H	T9990020CT
50mm (1.96")	T9990050AL-4	-	T9990050S	-	T9990050H	T9990050CT
50mm (1.96") Stainless Steel	T9990050SS-4	-	T9990050S	-	T9990050H	T9990050CT

Part Number	Description
T99923797	Magnetic Anchor Clamp - holds actuator securely during tests on vertical surfaces
T99912906	Araldite Standard Two Part Epoxy Adhesive, 2 x 15ml Tubes
T99923147	Dolly Cleaning Heating Tongs - EUR 220V / UK 240V
T99923103	Dolly Cleaning Heating Tongs - US 110V

● Calibration Certificate supplied as standard.

[1] Including Actuator with Standard Skirt fitted.

[2] 50mm (2") dollies are supplied in packs of 4.

Elcometer 510 Automatic Pull-Off Adhesion Tester

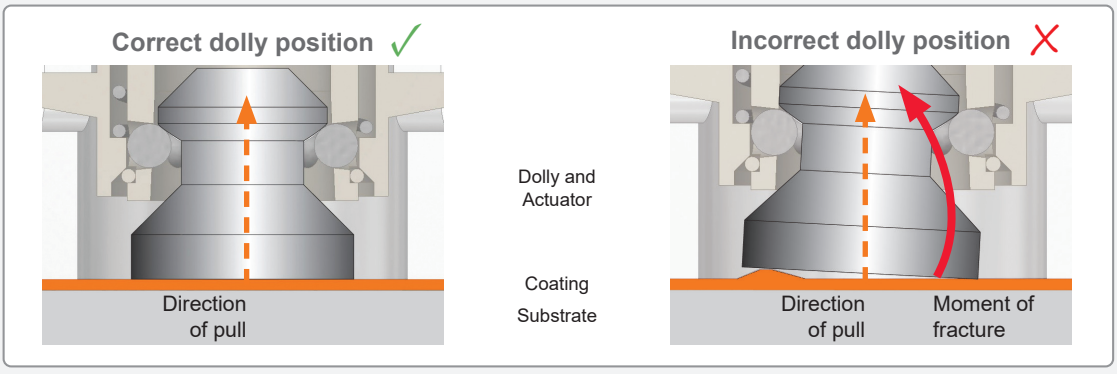
Pull-Off Adhesion Tests - Preventing Adhesive and Cohesive Failures

Preparing the surface and dolly

1. Select an appropriate test area which is flat and has sufficient area to attach the adhesion tester actuator.
2. Abrade the dolly and surface, clean both to remove any dust - minimising the risk of an 'adhesive' failure.

Fixing the dolly

3. Mix the adhesive correctly and apply a uniform adhesive film over the entire dolly face.
4. Test Standards require that the dolly is pulled off perpendicularly to the test surface. The dolly must therefore be adhered on to a prepared flat test surface (see images below). Apply an even pressure to the dolly to ensure that the dolly face is parallel to the test surface.
5. Remove any excess adhesive from around the dolly and allow to fully cure. Tape may be required when applying dollies to vertical surfaces during the cure process.
6. If required, once the dolly has fully cured, score the coating around the dolly.
7. Attach the actuator to the dolly and begin test.



Assessment of the Adhesion Test

For a valid pull-test, the coating must cover at least 50% of the area of the dolly face. If the glue fails and no coating is present on the dolly, or it covers less than 50% of the dolly face area, the pull-test is invalid and should be repeated.

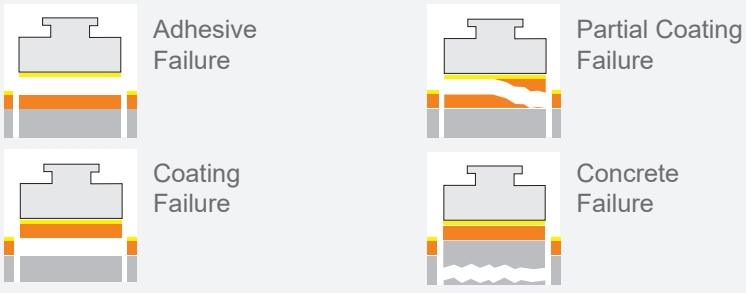
When the coating has failed within the layer leaving the same coating on both the dolly and the test panel it is known as a *'cohesive failure'*.

'Adhesive failures' occur when either the coating has failed at the interface with another coating (leaving a coating on the dolly and another coating on the substrate), or when the coating has failed at the substrate (leaving the coating on the dolly and the substrate bare).

NOTE: If the glue fails at a value above the specification then it can be reported that the adhesion exceeded the specification for this individual test.

Coating Adhesion Testing on Concrete





Elcometer 506 Pull-Off Adhesion Tester

The **Elcometer 506** Pull-Off Adhesion Testers allow the user to accurately measure the strength of the bond between the coating and the substrate.

STANDARDS:
ASTM D4541, ASTM D7234, AS/NZS 1580.408.5, BS 1881-207, DIN 1048-2, EN 12636, EN 13144, EN 1542, EN 24624, ISO 16276-1, ISO 4624, JIS K 5600-5-7, NF T30-606, NF T30-062

Hand-held, ergonomic and fully portable - ideal for on-site adhesion testing

Measurement range up to 50MPa (7250psi) with an accuracy of ±1% of full scale

Rotating crank handle applies an even uniform load up to 50MPa (7250psi)

Safety harness clip prevents accidental damage of surrounding areas during tests on vertical surfaces

2 YEAR* WARRANTY

etv video available elcometer.tv

Elcometer 506

Pull-Off Adhesion Tester



Sealed, heavy duty and impact resistant

Powerful

- Suitable for use on metal, wood, concrete and other substrates
- Rugged & lightweight - ideal for frequent testing
- Smooth load application up to 50MPa (7250psi)



Quick connect coupling for 14.2, 20 and 50mm diameter dollies

Flexible

- Easy to use hand-held design
- Ideal for laboratory use
- 14.2, 20 and 50mm (0.56, 0.76 & 1.96") diameter reusable dollies
- Measures on small, curved and flat surfaces



Actuator skirts for a range of substrate thicknesses and bond strengths, on flat or curved surfaces, ideal for thin substrates

Accurate

- Measurement range up to 50MPa (7250psi) with an accuracy of ±1% of full scale

Durable

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP65



Sealed, heavy duty and impact resistant

* The Elcometer 506 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

Elcometer 506 Pull-Off Adhesion Tester

Technical Specification

Part Number	Description		Certificate
F506-20D	Elcometer 506 Digital Adhesion Tester Kit; 20mm		●
F506-20DC	Elcometer 506 Digital Adhesion Tester Kit; 20mm - Certified		○
F506-50D	Elcometer 506 Digital Adhesion Tester Kit; 50mm		●
F506-50DC	Elcometer 506 Digital Adhesion Tester Kit; 50mm - Certified		○
Accuracy	±1% of full scale		
Pressure Rating	26MPa (3800psi)		
	14.2mm (0.56") Dolly	**20mm (0.76") Dolly**	**50mm (1.96") Dolly**
Operating Range	4 - 50MPa (600 - 7200psi)	2 - 25MPa (300 - 3600psi)	0.3 - 4MPa (50 - 580psi)
Scale Resolution	0.01MPa (1psi)	0.01MPa (1psi)	0.01MPa (1psi)
Instrument Length	290mm (11.5")	290mm (11.5")	290mm (11.5")
Actuator Height (skirt fitted)	85mm (3.4")	85mm (3.4")	110mm (4.3")
Instrument Weight	1.8kg (4lb)	1.8kg (4lb)	2.0kg (4.4lb)
Kit Weight	4kg (8.8lb)	4kg (8.8lb)	5.2kg (11.5lb)
Battery Type	2 x AA batteries (digital gauge only)		Battery Life: 2000 hours
Packing List:			
20mm Kit	Elcometer 506 Adhesion Tester with 20mm dollies (x10), standard skirt for 20mm dollies, 20mm dolly cutter handle, 20mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, carry case, 2 x LR6 (AA) batteries (Digital Gauge only), test certificate and operating instructions.		
50mm Kit	Elcometer 506 Adhesion Tester with 50mm dollies (x6), standard skirt for 50mm dollies, 50mm dolly cutter arbor, 50mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, carry case, 2 x LR6 (AA) batteries (Digital Gauge only), test certificate and operating instructions.		

Accessories

Dolly Diameter	Pack of 10[1]	Pack of 100	Standard Skirt	Thin Substrate Skirt	Dolly Cutter Handle	Dolly Cutter
14.2mm (0.56")	T9990014AL-10	T9990014AL-100	T9991420S	T9990014T	T9991420H	T9990014CT
20mm (0.76")	T9990020AL-10	T9990020AL-100	T9991420S	T9990020T	T9991420H	T9990020CT
50mm (1.96")	T9990050AL-4	-	T9990050S	-	T9990050H	T9990050CT
50mm (1.96") Stainless Steel	T9990050SS-4	-	T9990050S	-	T9990050H	T9990050CT

Part Number	Description
T99923797	Magnetic Anchor Clamp - holds actuator securely during tests on vertical surfaces
T99912906	Araldite Standard Two Part Epoxy Adhesive, 2 x 15ml Tubes
T99923147	Dolly Cleaning Heating Tongs - EUR 220V / UK 240V
T99923103	Dolly Cleaning Heating Tongs - US 110V

The Elcometer 506 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com. ● Test Certificate supplied as standard. ○ Calibration Certificate supplied as standard. [1] 50mm (2") dollies are supplied in packs of 4.

Elcometer 106 Pull-Off Adhesion Tester

The **Elcometer 106 Adhesion Tester** is easy to operate and is a fully portable Type II adhesion gauge which provides a numerical value for adhesion strength.

Hand-held, ergonomic and fully portable - ideal for on-site adhesion testing

Rotating handwheel applies an even uniform load up to 22MPa (3200psi)

Quick connect coupling for 20 and 40mm diameter dollies

Available in 5 scale ranges to test the adhesion on coatings on a variety of substrates



etv video available elcometer.tv

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

Elcometer 106

Pull-Off Adhesion Tester



- Supplied in a carry case - ideal for site tests
- Hand operated - no power supply necessary
- Includes a cutter for EN13144 and ISO 4624 tests

Applications for the Elcometer 106 Adhesion Test include paint or plasma spray on bridge decking, coatings on steel, aluminium, concrete, etc.

etv video available elcometer.tv

Technical Specification

		Range			
Part Number	Description	MPa (N/mm²)	kg/cm²	psi	Certificate
F106----1	Elcometer 106 Adhesion Tester - Scale 1	0.5 - 3.5	5 - 35	72 - 500	○
F106----2	Elcometer 106 Adhesion Tester - Scale 2	1 - 7.0	10 - 70	145 - 1000	○
F106----3	Elcometer 106 Adhesion Tester - Scale 3	3 - 15	30 - 150	435 - 2000	○
F106----4	Elcometer 106 Adhesion Tester - Scale 4	5 - 22	50 - 220	725 - 3200	○
F106----5	Elcometer 106 Adhesion Tester - Scale 5	0.05 - 0.2	0.5 - 2.0	7.25 - 30	○
Dimensions	Scales 1, 2, 5: 175 x 76mm (7 x 3") Scales 3 and 4: 185 x 76mm (7.5 x 3")				
Dolly Diameter	20mm (0.76")	Dolly Area	314mm² (0.49sq inch)		
Gross weight of Kit	Scale 1, 2 and 5: 2.8kg (6.2lb)	Scale 3: 4.2kg (9.3lb)	Scale 4: 4.5kg (9.9lb)		
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 Standard Two Part Epoxy Adhesive, 2 x 15ml Tubes
T99914009	20mm (0.76") Dolly Cutter

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.

○ Optional Calibration Certificate available.

Elcometer 508 Digital Push Off Adhesion Tester

The extremely versatile **Elcometer 508** Type III† Adhesion Tester can be used for many adhesion testing requirements on flat or curved (concave and convex) surfaces.

Compatible with standard, convex and concave dollies

Hand-held, ergonomic and fully portable - ideal for on-site adhesion testing

Measurement range up to 25MPa (3630psi) with a full scale accuracy of ±1.5%

Quick connect coupling for easy connection to the dolly

Rotating crank handle applies smooth loading from 2 up to 25MPa (3630psi)



2 YEAR* WARRANTY

STANDARDS:
ASTM D 4541, ISO 16276-1, NF T30-606

†Type III in accordance with ASTM D 4541

Elcometer 508 Digital Push Off Adhesion Tester

Powerful

- Suitable for use on flat, concave & convex surfaces
- Rugged & lightweight
- Smooth load application up to 25MPa (3630psi)

Durable

- Sealed, heavy duty & impact resistant
- Dust & waterproof equivalent to IP65

Flexible

- Easy to use hand-held design
- Reusable stainless steel dollies
- MPa / psi switchable

Accurate

- Measurement range up to 25MPa (3630psi)
- Full scale accuracy of ±1.5%
- Maximum hold - displays the highest value reached

Technical Specification

Part Number UK 240V/EUR 220V	Part Number US 110V	Description	Certificate
F508-DD	F508-DC	Elcometer 508 Digital Push Off Adhesion Tester	•
Dolly Size	Outside Diameter	19.4mm (0.76")	
	Inside Diameter	3.7mm (0.15")	
	Area	284mm² (0.44sq inch)	
Scale Range		0 - 26MPa (0 - 3800psi)	
Operating Range		2 - 25MPa (290 - 3630psi)	
Scale Resolution		0.01MPa (1psi)	
Accuracy		±1.5% of full scale	
Power Supply		2 x AA alkaline dry batteries (rechargeable batteries can be used)	
Weight		Gauge: 1.7kg (3.7lb) Kit: 4.5kg (9.9lb)	
Instrument Length		290mm (11.5") Coupling Height: 200mm (8")	
Packing List		Elcometer 508, transit case, 5 flat dollies, 5 dolly plugs, MC1500 quick curing adhesive, dolly cleaning tool, 2 x LR6 (AA batteries), operating instructions and calibration certificate	

Accessories

Part Number	Description	Part Number	Description
T9999646-	Standard Flat Dolly (x 1)	-	Concave & Convex Dollies available upon request
T99911135	Cyanoacrylate Adhesive	T9994586-	Dolly Cleaning Tool
T99911136	Dolly Plug (x 5)	T99923147	Dolly Cleaning Heating Tongs - EUR 220V / UK 240V
T99914009	Dolly Cutter	T99923103	Dolly Cleaning Heating Tongs - US 110V

* The Elcometer 508 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

• Calibration Certificate supplied as standard.

Elcometer 108 Hydraulic Adhesion Tester

The **Elcometer 108** Hydraulic Adhesion Tester is an extremely versatile Type III[1] adhesion tester which can be used for many applications, even on flat or curved surfaces.



Compatible with standard, convex and concave dollies to test on flat or curved surfaces.

Hand-held, ergonomic and fully portable - ideal for on-site adhesion testing

Measurement range up to 25MPa (3630psi) with a full scale accuracy of ±3%

Rotating crank handle applies smooth loading from 0 up to 25MPa (3630psi)

Quick connect coupling for easy connection to the dolly

2 YEAR[2] WARRANTY

STANDARDS:
ASTM D 4541, ISO 16276-1, NF T30-606

[1] Type III in accordance with ASTM D 4541 [2] The Elcometer 108 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

Elcometer 108

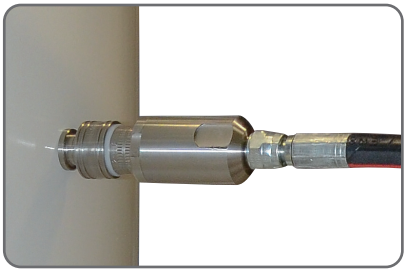
Hydraulic Adhesion Tester



Digital and analogue gauges available

Powerful

- Suitable for use on flat, concave & convex surfaces
- Rugged & lightweight
- Smooth load application up to 25MPa (3630psi)



Safety coupling sleeve prevents accidental damage of surrounding areas during test on vertical surfaces

Flexible

- Ideal for laboratory use
- Reusable stainless steel dollies
- MPa / psi switchable



A wide range of curved dollies available, each designed for a specific range of curvature

Accurate

- Measurement range up to 50MPa (7250psi) with an accuracy of ±3%
- Maximum hold - displays the highest value reached



Sealed, heavy duty and impact resistant

Durable

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP65

Elcometer 108 Hydraulic Adhesion Tester

Technical Specification

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	○
Scale Range		Analogue: 0 - 25MPa (0 - 3600psi) Digital: 0 - 25MPa (0 - 3600psi)	
Operating Range		Analogue: 2 - 18MPa (290 - 2600psi) Digital: 2 - 18MPa (290 - 2600psi)	
Scale Resolution		Analogue: 1MPa (100psi) Digital: 0.1MPa (1psi)	
Analogue Instrument Accuracy		±1MPa Metric Scale; 150psi Imperial Scale	
Digital Instrument Accuracy		±3% or 0.4MPa (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, 2 x LR6 (AA batteries) (Digital gauge only) and operating instructions	

Accessories

T99911135	Cyanoacrylate Adhesive
T9999646-	Standard Flat Dolly 19.4mm (0.76”)
T99923147	Dolly Cleaning Heating Tongs - EUR 220V / UK 240V
T99923103	Dolly Cleaning Heating Tongs - US 110V

Concave & Convex dollies are available upon request

○ Calibration Certificate available.

Elcometer 107 Cross Hatch Cutter

The **Elcometer 107 Cross Hatch Cutter** provides an instant assessment of the quality of the bond to the substrate.



Robust design with a large non slip grip ideal for laboratory test

A quick change, four sided cutter allows adhesion testing on a wide range of coating thicknesses (1mm, 1.5mm, 2mm and 3mm)

Available as a basic kit or as a full kit supplied with either ASTM or ISO adhesive tape

Ideal for thin, thick or tough coatings on all surfaces

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

Elcometer 107

Cross Hatch Cutter



Due to its rugged construction, the Elcometer 107 Cross Hatch Cutter is ideal to assess the quality of the bond of thin, thick or tough coatings to a substrate on different types of surfaces.

With a range of interchangeable cutter blades available with different cutter spacings, the Elcometer 107 Cross Hatch Cutter can be used to test to a variety of standard methods.

The Elcometer 107 is available as either a Basic Kit or as a Full Kit which includes a brush, magnifier (x6 magnification) and either ISO or ASTM adhesive tape.

Technical Specification

Part Number	Description	Cutter Type	Coating Thickness		Certificate
F10713222-1	Elcometer 107 Basic Kit	6 x 1mm	0 - 60µm	0 - 2.4mils	○
F10713348-6	Elcometer 107 Full Kit with ISO Tape	6 x 1mm	0 - 60µm	0 - 2.4mils	○
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	0 - 90µm*	0 - 3.5mils*	○
F10713222-4	Elcometer 107 Basic Kit	6 x 2mm	50 - 125µm	2.0 - 5.0mils	○
F10713348-9	Elcometer 107 Full Kit with ISO Tape	6 x 2mm	61 - 120µm	2.4 - 4.7mils	○
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	5.0 - 10mils	○

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), magnifier (x6 magnification), brush and adhesive tape (either ASTM or ISO tape), all in a plastic ABS carry case

Accessories

		Methods			
Part Number	Description	ISO	ASTM	AS	Certificate
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		•		
T9999358-1	Adhesive Tape (1 roll) ISO 2409	•			
T9998894-	Adhesive Tape (2 rolls) ASTM D 3359		•		
T9999358-2	Adhesive Tape (2 rolls) ISO 2409	•			

* Approximate Thickness

○ Optional Calibration Certificate available.

Elcometer 1542

Cross Hatch Adhesion Tester



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

The Elcometer 1542 is ideal for measuring the cross hatch adhesion of coatings up to 250µm (9.8mils) on flat surfaces and test panels.

Measure on large or small panels by quickly changing the position of the guide wheel using the hexagonal wrench provided.

Each cutter wheel consists of 8 cutting faces. When one face becomes worn, rotate the cutting wheel to the next face.

The Elcometer 1542 is available with three different cutter spacings 1, 2 & 3mm for a range of coating thickness (see table below).

The Elcometer 1542 is available on its own (Basic Kit) or as a Full Kit which includes a brush, magnifier & ISO or ASTM adhesive tape. There are also Advanced Kits which include all three (1, 2 & 3mm) cross hatch adhesion testers, together with either ISO or ASTM adhesive tape.

Technical Specification

Part Number	Description	Cutter Type	Coating Thickness		Certificate
K1542M001	Elcometer 1542 Basic Kit	6 x 1mm	0 - 60µm	0 - 2.4mils	○
K1542M002	Elcometer 1542 Basic Kit	6 x 2mm	50 -125µm	2 - 5.0mils	○
K1542M003	Elcometer 1542 Basic Kit	6 x 3mm	121 - 250µm	4.8 - 9.8mils	○
K1542M001-I	Elcometer 1542 Full Kit - ISO Tape	6 x 1mm	0 - 60µm	0 - 2.4mils	○
K1542M002-I	Elcometer 1542 Full Kit - ISO Tape	6 x 2mm	50 -125µm	2.0 - 5.0mils	○
K1542M003-I	Elcometer 1542 Full Kit - ISO Tape	6 x 3mm	121 - 250µm	4.8 - 9.8mils	○
K1542M001-A	Elcometer 1542 Full Kit - ASTM Tape	6 x 1mm	0 - 60µm	0 - 2.4mils	○
K1542M002-A	Elcometer 1542 Full Kit - ASTM Tape	6 x 2mm	50 - 125µm	2 - 5.0mils	○
K1542M204-I	Elcometer 1542 Advanced Kit - ISO Tape	6 x 1, 2, 3mm	0 - 250µm	0 - 9.8mils	○
K1542M204-A	Elcometer 1542 Advanced Kit - ASTM Tape	6 x 1, 2, 3mm	0 - 250µm	0 - 9.8mils	○

Packing List

Basic Kit: 1 x Elcometer 1542 Cross Hatch Tester*, cutter angle adjustment tool, hexagonal wrench, transit case & user guide

Full Kit: Basic Kit plus: brush, magnifier (x6 magnification) & ISO or ASTM adhesive tape

Advanced Kit: 3 x Elcometer 1542 Cross Hatch Testers (1, 2 & 3mm), cutter angle adjustment tool, hexagonal wrench, brush, magnifier (x6 magnification), ISO or ASTM adhesive tape, transit case & user guide

Accessories

		Methods			
Part Number	Description	ISO	ASTM	AS	Certificate
KT1542P001	6 x 1mm Cross Hatch Cutter Wheel	•			○
KT1542P002	6 x 2mm Cross Hatch Cutter Wheel	•	•	•	○
KT1542P003	6 x 3mm Cross Hatch Cutter Wheel	•			○
K0001539M001	Adhesive Tape (1 roll) ASTM D 3359	T9998894-2	Adhesive Tape (2 rolls) ASTM D 3359		
T9999358-1	Adhesive Tape (1 roll) ISO 2409	T9999358-2	Adhesive Tape (2 rolls) ISO 2409		
T10713356	Magnifier (x6 magnification)	T99913357	Cross Hatch Brush		

* 6 x 1mm, 6 x 2mm or 6 x 3mm cutter dependent on Part Number.

○ Optional Calibration Certificate available.

Elcometer 1540

Cross Cut Tester



The Elcometer 1540 is a simple instrument for quickly determining the adhesion of a large variety of paints up to 50µm (2mils) thickness.

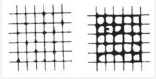
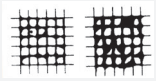
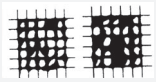
Made from steel, it has 11 tapered teeth with 1mm spacing. Two sets of lines are cut at right angles to obtain a pattern of 100 squares.

Results are determined by the table below.

Technical Specification

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

○ Optional Calibration Certificate available.





Abrasion & Washability

13



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.

These mechanical tests can make an accurate comparison between samples and can be used to determine lifetime wear.

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 a 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.

Elcometer 1720 Abrasion & Washability Testers

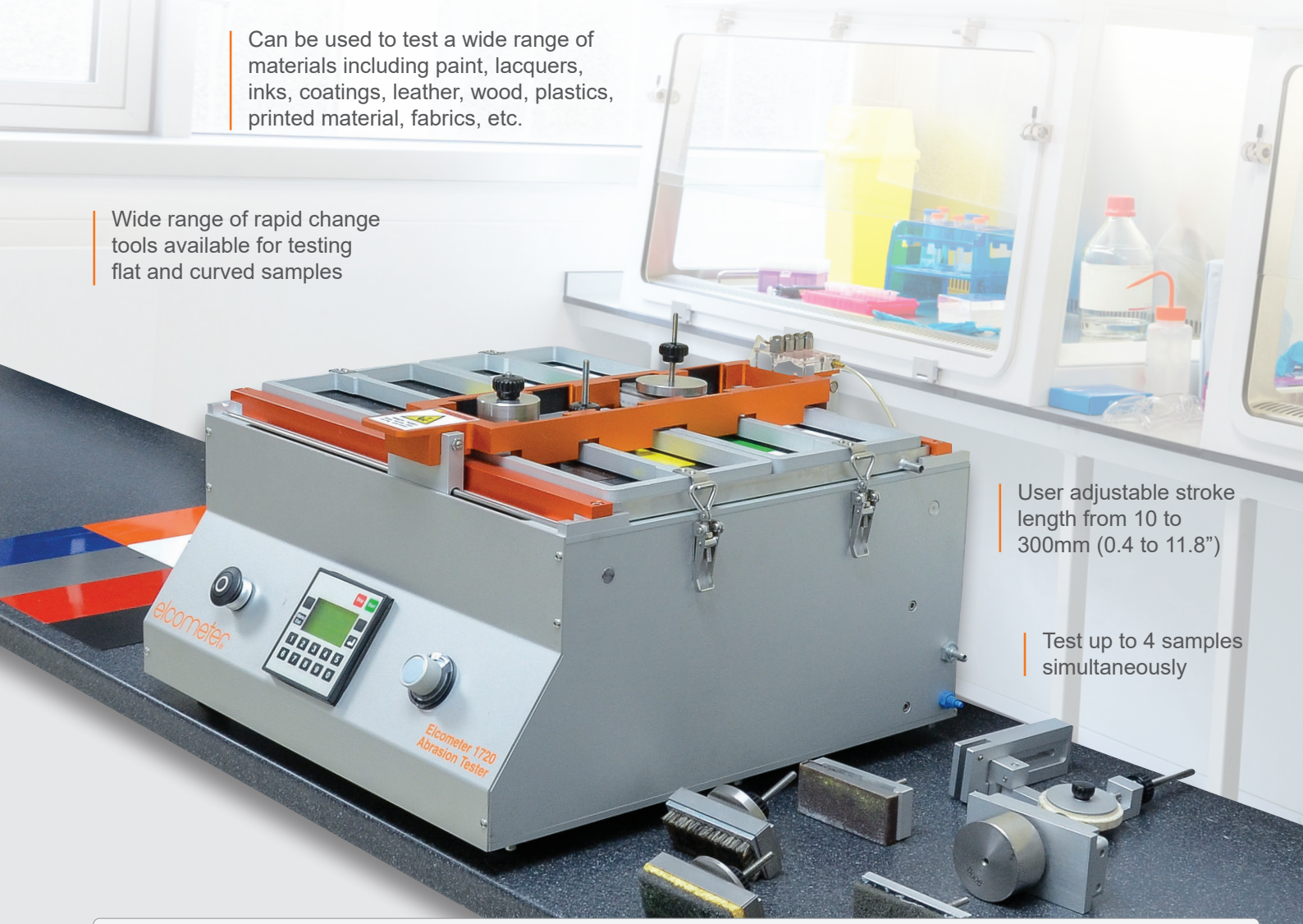
The **Elcometer 1720** is robust, reliable and extremely versatile and is designed for testing the washability, brushability and resistance of a wide range of materials.

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

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

Can be used to test a wide range of materials including paint, lacquers, inks, coatings, leather, wood, plastics, printed material, fabrics, etc.

Wide range of rapid change tools available for testing flat and curved samples



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

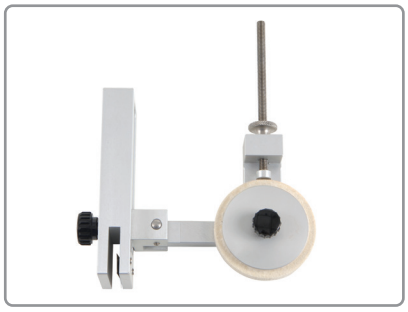
Test up to 4 samples simultaneously

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 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)

Elcometer 1720

Abrasion & Washability Testers



Meeting Standards

- With a wide range of tools available, many tests for different Standards can be completed 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
- Washability and abrasion testing on flat and curved samples up to 13mm (0.51") thick



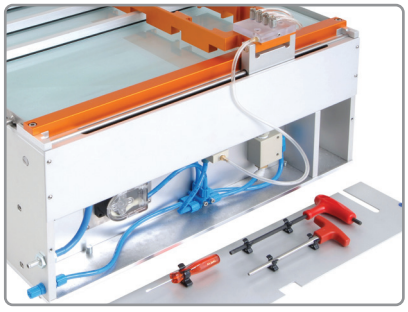
Interchangeable Tools

- 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 page 13-6



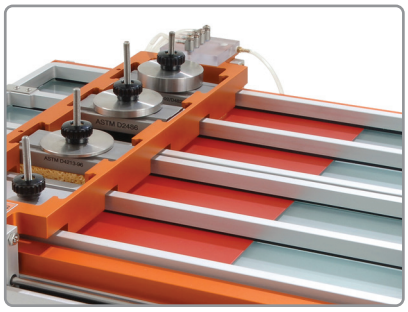
User Adjustable

- 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 to 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 or dry conditions



Economic

- With the ability to test up to 4 different characteristics simultaneously, significant time can be saved
- With its rapid tool change system setting up tests is fast and easy
- Easy sample placement allows quick change between tests

Elcometer 1720 Abrasion & Washability Testers



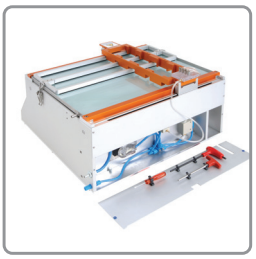
Test up to 4 different samples simultaneously.



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



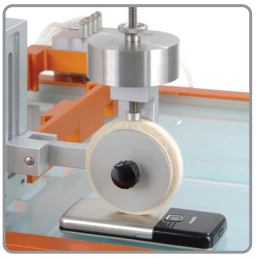
Stroke length can be adjusted by the user to meet specific requirements, from 10 to 300mm (0.4 to 11.8”).



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

Part Number	Description
K1720M204	Elcometer 1720 Abrasion Tester, 4 Station (110 - 240V)
K1720M304	Elcometer 1720 Abrasion & Washability Tester, 4 Station (110 - 240V)
Dimensions	550 x 460 x 320mm (21.7 x 18.1 x 12.6”)
Weight	33kg (73lb)
Packing List	Elcometer 1720, 250µm (10mil) metal strip for ASTM D2486 Standard, sample drip tray, 2 x glass sheet, 2 x specimen holding frame, set of 3 tools for instrument set up, 3 x mains leads (UK, EUR and US) and operating instructions. Elcometer 1720 part number K1720M304 also includes a liquid dosing bottle, liquid delivery pipe and 2 liquid drain pipes. Tools are supplied separately, please order from the list on page 19-6.



Scrub Test Panels are also available - see page 13-8 for more information

Elcometer 1720 Abrasion & Washability 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 section 18. 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 (x 5).
Total weight: 135g (4.76oz)

Part Number: KT001720P036

STANDARDS:
ISO 11998



Tool 7: Universal Material Clamp

Stainless steel holder which allows 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 -
2 x 100g (3.5oz), 1 x 200g (7oz),
1 x 500g (17.6oz). Total weight (excluding masses): 200g (7oz)

Part Number: KT001720P074

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

Elcometer 1720 Abrasion & Washability 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 (14.1oz)

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 (31.7oz)

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, 1 x 50g (1.75oz), 1 x 100g (3.5oz), 2 x 200g (7oz) and 2 x 500g (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 13-8

Elcometer 4695

Scrub Test Panels



Form P121-10N



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



Fig 2. Typical failure without

STANDARDS:
ISO 11998, ASTM D2486

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 10mil 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 the calculation of equivalent loss in film thickness.

These Scrub Test Panels are ideal for use with the Elcometer 1720 Washability & Abrasion Tester, see page 13-3.

Technical Specification

Part Number		Description	Chart Dimensions		Quantity per Box	Boxes per Case
Box	Case		mm	inches		
K0004695M068	K0004695M268	Black Scrub Test Panel P121-10N	165 x 432	6½ x 17	100	5
K0004695M069	K0004695M269	White Scrub Test Panel P123-10N	165 x 432	6½ x 17	100	5

Accessories

KT001720P012	ASTM Test Foil 250µm (10mils)

Elcometer 5750

Taber® Linear Abrasers







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

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

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*		

* Crockmeter kit includes finger, clamp ring and cloths

Elcometer 1700 & 1750

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 UK/EUR 230V	Part Number US 115V	Description		Certificate
ST981700-2	ST981700-1	Elcometer Taber® 1700 Single Head Abraser		●
ST981750-2	ST981750-1	Elcometer Taber® 1750 Dual Head Abraser		●
Dimensions & Weights		Elcometer Taber® 1700:	315 x 391.2 x 213.4mm (12.4 x 15.4 x 8.4”), 14.9kg (33lb)	
		Elcometer Taber® 1750:	535.9 x 393.7 x 213.4mm (21.1 x 15.5 x 8.4”), 24.9kg (55lb)	
		Vacuum unit:	279 x 279 x 610mm (11 x 11 x 24”),10.4kg (23lb)	
Packing List		**Elcometer Taber® 1700 Single Head Abraser:** Single head abraser unit with switchable power input (115/230v, 60/50hz), vacuum unit (with 115V or 230V power supply), 2 x 500g auxiliary weights, 2 x 1000g auxiliary weights, SH-125 specimen holder (supplied fitted to the abraser), SH-101 hold down ring (supplied fitted to the abraser), S-12 hand brush, Torx T25 screwdriver, operating instructions **Elcometer Taber® 1750 Dual Head Abraser:** Dual head abraser unit with switchable power input (115/230v, 60/50hz); vacuum unit (with 115V or 230V power supply), vacuum y-adaptor & hose kit, 4 x 500g auxillary weights, 4 x 1000g auxillary weights, 2 x SH-125 specimen holder (supplied fitted to the abraser), 2 x SH-101 hold down ring (supplied fitted to the abraser), S-12 hand brush, Torx T25 screwdriver, operating instructions		

● Calibration Certificate supplied as standard.

Elcometer 1700 & 1750

Taber® 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 1700 and 1750 Taber® Rotary Abrasers (2 wheel set)

Part Number	Description	Abrasive Action	Composition
ST125319	CS-5 Resilient Wheel (Pack of 2)	None	Wool Felt
ST135177	CS-8 Resilient Wheel Set (Pack of 2)	Extra Mild	Rubber & Abrasive Grain
ST125321	CS-10F Resilient Wheel (Pack of 2)	Very Mild	Rubber & Abrasive Grain
ST125320	CS-10 Resilient Wheel (Pack of 2)	Mild	Rubber & Abrasive Grain
ST132684	CS-10P Resilient Wheel Set (Pack of 2)	Mild	Rubber & Abrasive Grain
ST130950	CS-10W Resilient Wheel Set (Pack of 2)	Mild	Rubber & Abrasive Grain
ST125322	CS-17 Resilient Wheel (Pack of 2)	Harsh	Rubber & Abrasive Grain
ST125345	S-35 Non-resilient Wheel (Pack of 2)	Severe Cutting	Tungsten Carbide
ST125529	S-39 Non-Resilient Wheel (Pack of 2)	-	Leather
ST132720	S-24 Non-Resilient Wheel (Pack of 2)	-	Aluminium
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
ST132661	CS-T3 Resilient Wheel Set (Pack of 2)	Very Mild	Rubber & Abrasive Grain
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-33	Fine	Sand Paper Strips (pack of 100)

All the items listed above are compatible with both the new (Elcometer 1700 and Elcometer 1750) and old models (Elcometer 5135 and Elcometer 5155)



For use with the Elcometer 1700 & 1750 Taber® Rotary Abrasers, see page 13-10

Elcometer 1700 & 1750 Taber® Rotary Abraser Accessories

Accessories



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	Description
ST985000	Model 5000 Sample Cutter
ST128530	Replacement Blades (Pack of 5)



Taber® Grit Feeder

The Grit Feeder is a freestanding instrument used in conjunction with the Taber Abraser (Model 1700 or 1750).

During testing, abrasive grit particles (e.g. aluminum oxide) are uniformly and continuously distributed onto the specimen surface at a specified rate. As the specimen holder rotates, the loose grit particles pass under two S-39 leather clad brass wheels.

Used grit and wear debris are then removed by the Taber Abraser vacuum system. The operation of the Grit Feeder is controlled through the Taber Abraser, ensuring the specimen holder turntable, grit distribution and vacuum suction are actuated simultaneously.

Part Number: ST980355



For use with the Elcometer 1700 & 1750 Taber® Rotary Abrasers, see page 13-10

Elcometer 1700 & 1750

Taber® Rotary Abraser Accessories



Quiet Cabinet

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

The upper cabinet provides a convenient, dust-free workspace for the Abraser and features a Plexiglas® viewing window to monitor testing and a 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 upper and base separately. The base cabinet exhaust system is available for 230V/50Hz or 115V/60Hz.

Technical Specification

Part Number	Description
ST136134-115	Complete set (115V, 60Hz) - both base and upper units
ST136134-230	Complete set (230V, 50Hz) - both base and upper units
ST136132	Upper unit only
ST136133-115	Base unit only (115V, 60Hz)
ST136133-230	Base unit only (230V, 50Hz)



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 (x 15)
- 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®

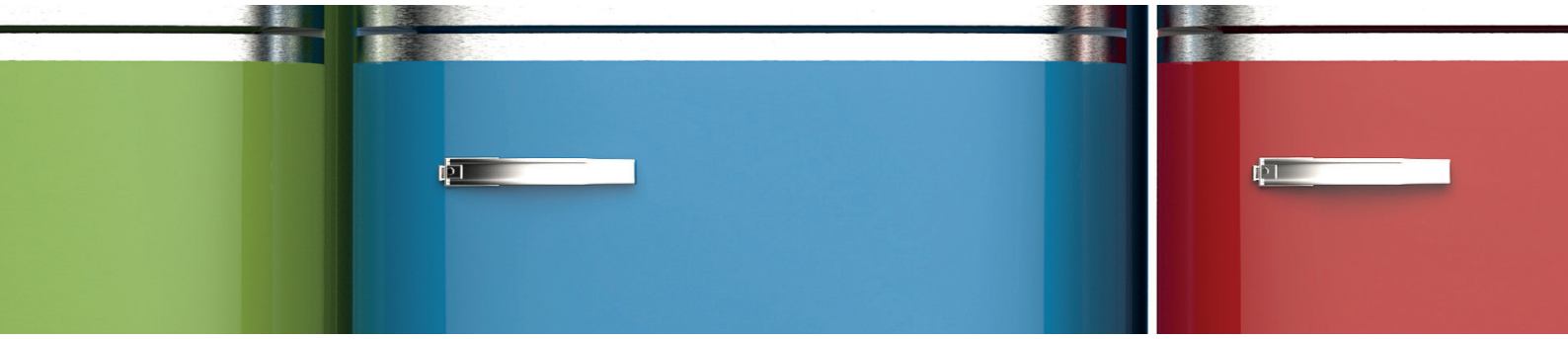
Gloss & Colour

Gloss & Haze Measurement 14-2

Colour 14-12



14



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.

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°.

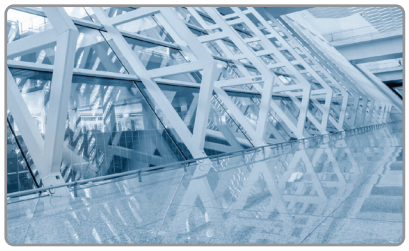
Rspec: Peak specular reflectance is a measure of the peak gloss value of a surface; this value is obtained very close to the specular angle.

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.

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.

Visual appearance can determine a person's perception of a product. A key parameter used to define a product's overall visual quality is ***gloss***.













Choosing the correct angle for gloss measurement:

Gloss Measurement

Gloss measurement is based on the amount of light reflected on the surface relative to a polished glass reference standard, measured in Gloss Units (GU).

The amount of light that is reflected on the surface is dependent upon the angle of incidence and the properties of the surface.

Gloss Categories

Gloss is categorised as either matt, semi or high gloss.

In order to determine the most appropriate measurement angle start with a glossmeter set at a 60° angle of incidence.

Results

Gloss is measured in Gloss Units (GU).

If the result is between 10 - 70GU, the coating is termed 'semi-gloss' and should be measured using the 60° angle. If the result is less than 10GU, the product is 'low gloss' and should be measured using the 85° angle and if it is greater than 70GU, the product is known as 'high gloss' and should be measured using the 20° angle.

Anodised Metals

All three angles should be recorded (20, 60 & 85°) when measuring gloss on anodised metals.

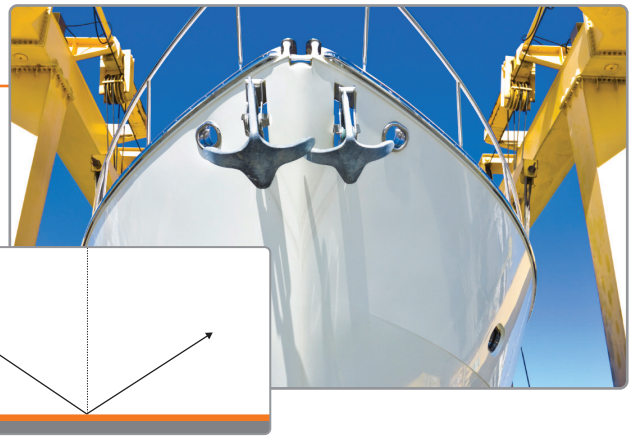
This ensures there is a complete understanding of the specular reflectance between the coating and the metal substrate.

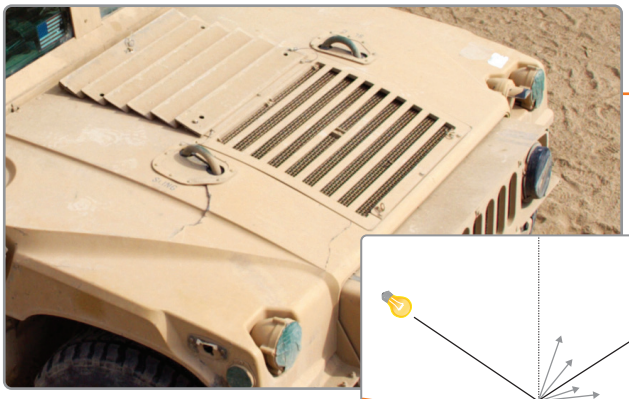
Gloss Range	60° value	Measure with
High Gloss	> 70GU	20°
Semi Gloss	10 - 70GU	60°
Low/ Matt	< 10GU	85°

Gloss is measured by directing a constant intensity light beam, at a fixed angle, on to the test surface and then monitoring the amount of reflected light from the same angle. This specular reflectance is measured using a glossmeter. Different surfaces require different reflective angles:

High Gloss

- Surfaces with a brilliant or highly polished finish reflect images clearly.
- This distinct reflection is caused by the incident light reflecting on the surface in a specular direction.





Semi & Matt Gloss

- Semi and matt surfaces reflect images less distinctly and with reduced intensity.
- On semi or matt surfaces light not only reflects in a specular direction but also is scattered causing the reflected image to appear diffused.

% Reflectance (%)

% Reflectance compares the amount of light energy transmitted and received by a glossmeter and expresses the value as a percentage. The shinier a surface is, the closer the value will be to 100%.

Whilst the Gloss Unit (GU) scale is linear, each angle of incidence has a different measurement range; 0 – 2000GU (20°), 0 – 1000GU (60°), 0 – 160GU (85°).

% Reflectance displays the measurement value as a percentage relative to the selected angle of incidence. For example, a value of 1000GU at 20° would be expressed as 50%$_{20}$ and 500GU would be expressed as 25%$_{20}$, but at 60° this would be expressed as 50%$_{60}$.

Haze (HU)

Haze causes a drop in reflected contrast and causes 'halos' to appear around the reflected light sources, dramatically reducing the visual quality. In accordance with ASTM D4039 haze is defined as the numeric difference between the specular reflectance at 60° and 20°.

This is expressed in Haze Units (HU).

Elcometer 480 Glossmeters

The **Elcometer 480** range of handheld glossmeters combine accuracy, repeatability and reproducibility with functionality allowing you to measure Gloss, % Reflectance & Haze with ease.

- Multiple angles; 20°, 60°, 85° and Differential Mode with pass/fail
- Standard, Auto Repeat and Scan Modes and 40 user definable limit standards
- 3 - 10 readings per second with 40,000 reading memory in up to 2,500 batches
- Auto calibration tile recognition via RFID[1]
- Date and time stamped readings
- Display readings, statistics, graphs & batch review



- USB & Bluetooth® data output to PC, iPhone or Android™ devices
- Small, robust & ergonomic

Bluetooth® wireless technology | compatible with ElcoMaster® | etv video available elcometer.tv | 2 YEAR* WARRANTY

STANDARDS:

AS/NZS 1580.602.2, ASTM C584, ASTM D523, ASTM D1455, ASTM D2457, ASTM D4039, ASTM E430, ASTM E2387, BS 3900 D5, DIN 67530, ECCA T2, EN 12373-11, EN 13523-2, ISO 7668, ISO 2813, ISO 13803, JIS K 5600-4-7, JIS Z 8741, TAPPI T 653 (20°)

* The Elcometer 480 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

[1] Radio Frequency Identification; European Patent Number: 2906904

Elcometer 480

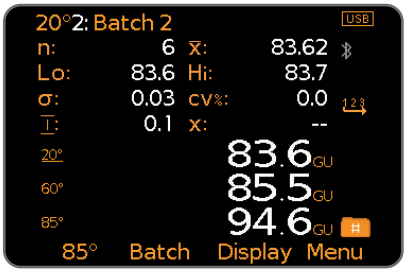
Glossmeters



Single, dual and triple angle glossmeters available



Store up to 40,000 readings in up to 2,500 batches



Multiple display options and measurement modes

Model Range

Available as either a simple entry level 60° glossmeter or state of the art Single, Dual or Triple angle variants.

Memory and Batching

Store up to 40,000 date and time stamped readings in up to 2,500 user definable alphanumeric batches.

Display Modes

The scratch and solvent resistant colour LCD screens display gloss, % reflectance or haze readings, statistics, trend graphs or an analogue scan bar.

Accurate & Repeatable

Advanced electronics and state-of-the-art optical design ensures highly accurate, repeatable and reproducible measurements.

Range	0-10GU	10-100GU	100-2000GU
Repeatability	±0.1GU	±0.2GU	±0.2%
Reproducibility	±0.2GU	±0.5GU	±0.5%



Wireless Connectivity

Readings can be transferred to PC, iPhone, Android™ or other mobile devices via USB or Bluetooth® for instant reporting using ElcoMaster® Software.

Elcometer 480 Glossmeters

Measurement Modes

Standard, Auto Repeat & Scan Modes



No two inspections are the same. It is for this reason that the Elcometer 480 is equipped with three measurement modes:

- Standard Mode: Press the measure button to take an individual spot measurement.
- Auto Repeat Mode: When the glossmeter is slid over the surface a measurement of all three angles is automatically taken at a user definable rate between 10 - 180 readings per minute. When enabled all the individual readings are stored into memory.
- Scan Mode: As the glossmeter slides over the entire surface area the gauge measures all three angles at a continuous rate of 10 readings per second. When stopped, the gauge displays and stores the average, highest and lowest values - ideal for checking a sample's overall uniformity.

Limit Standards and Differential Mode with Pass/Fail

When visual appearance is critical Master Standards are created. These are generated and approved by the customer and then used by manufacturers as part of their quality control inspection regime. As these Master Standards have been visually approved they often do not have numerical gloss values assigned.

In order to avoid subjectivity between inspectors, the Elcometer 480 can automatically generate and store the nominal (target), highest & lowest acceptable gloss values (Limits) from the Master Standard.

Up to 40 Limits for each customer's Master Standards can be stored within, and recalled from, the gauge's 'Limit Standards' memory.



When Limit Standards are used in combination with the gauge's Differential Mode, the Elcometer 480 displays the measurement value together with the difference from the nominal (target) value.

Readings outside the Limit Standards are displayed in red, providing quick Pass/Fail analysis.

Due to the Elcometer 480's industry leading inter-instrument agreement, once a Master Standard Limit has been created, the gauge can transfer these values to other Elcometer 480 glossmeters, via the ElcoMaster® Software's Library of Limit Standards, at any time.

Information from multiple glossmeters can be combined into a single inspection report within ElcoMaster® Software, ideal for multiple production and assembly lines.

Elcometer 480 Glossmeters

Product Features	■ Standard	□ Optional
	Model B	Model T
Measurement geometries	60°	60°, 20/60° or 20/60/85°*
Measurement units	GU	GU, HU[1] & %
Fast, accurate reading rate	■	■
Repeatable & reproducible measurements	■	■
Easy to use menu structure; *in 30+ languages*	■	■
Tough, impact, waterproof & dust resistant	■	■
Scratch & solvent resistant colour display; *2.4" (6cm) TFT*	■	■
Rotating display: *auto, 0°, 180°*	■	■
Ambient light sensor; *with adjustable auto brightness*	■	■
Data output		
USB live readings	■	■
USB batch download		■
Bluetooth®: *to PC, iOS or Android™ mobile devices*		■
USB & battery powered	■	■
Calibration Certificate	■	■
Manual gauge calibration	■	■
Auto gauge calibration; *via RFID tagging of integrated calibration tile*[2]		■
On screen statistics - *user selectable*		
Number of readings, Mean (average), Standard deviation,	■	■
Highest reading, Lowest reading, Range		■
Coefficient of variation,		■
Nominal value, High Limit value, Low Limit value		■
Number above high limit, Number below low limit		■
Measurement modes		
Standard Mode	■	■
Auto Repeat Mode*; programmable 10-180 readings per minute*		■
Scan Mode; *10 readings per second*		■
Differential Mode with Pass/ Fail mode*;*		■
Limit Standards; *up to 40 programmable standards*		■
Gauge & batch specific standard limits		■
Gauge memory 40,000 readings in up to 2,500 batches		■
Alpha-numeric batch names		■
Fixed batch size mode		■
Date and time stamp		■
Gauge auto diagnostics	■	■
Display modes; *user selectable*		
Readings; *gloss, % reflectance, haze*[1]	■	■
Selected statistics	■	■
Live trend graph; *last 20 readings*		■
Scan bar		■
Readings & differential (with pass/fail)		■
Delete last reading	■	■
2 year extended warranty[3]	■	■

* Dependant on model

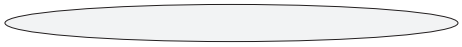
[1] Haze on Dual and Triple models only

[2] Radio Frequency Identification; European Patent Number: 2906904

[3] The Elcometer 480 is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.elcometer.com.

Elcometer 480 Glossmeters

Technical Specification

Part Number	Description			Certificate
J480B-6	Elcometer 480 Model B 60° Glossmeter			●
J480T-6	Elcometer 480 Model T 60° Glossmeter			●
J480T-26	Elcometer 480 Model T 20/60° Glossmeter			●
J480T-268	Elcometer 480 Model T 20/60/85° Glossmeter			●
Display information	2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels			
Power	USB (via PC) or 2 x AA batteries (~50,000 readings)			
	20°	60°	85°	
Measurement Dimensions				
	20°: 10 x 10mm	60°: 8 x 16mm	85°: 4 x 55mm	
Measurement Range	0 - 2,000GU	0 - 1,000GU	0 - 160GU	
Repeatability	± 0.1GU (0 - 10GU); ±0.2GU (10 - 100GU); ±0.2%: 100 - 2000GU			
Reproducibility	± 0.2GU (0 - 10GU); ±0.5GU (10 - 100GU); ±0.5% 100 - 2000GU			
Resolution	Gloss:	0.1 GU (0 - 100GU); 1 GU (>100GU)		
	% Reflectance:	0.01% (0 - 10%); 0.1% (10 - 100%)		
	Haze:	0.1 HU (0 - 100HU); 1 HU (>100HU)		
Operating Temperature	-10°C to 50°C (14 to 122°F); Relative Humidity: 0 - 85%RH			
Dimensions (H x W x D)	68 x 155 x 50mm (2.68 x 6.10 x 1.97")			
Weight	534g (1lb 3oz) *[including batteries]*			
Packing List	Elcometer 480 Glossmeter, integrated calibration tile, calibration certificates for gauge & calibration tile, 2 x AA batteries, wrist strap, operating instructions, plastic carry case, ElcoMaster® Software (Model T) and USB cable (Model T)			

Accessories

T48024798-LC	Low Gloss Calibration Tile	Nominal Value: 22GU at 60°	●
T48024798-MDC	Mid Gloss Calibration Tile	Nominal Value: 55GU at 60°	●
T48024798-HC	High Gloss Calibration Tile*	Nominal Value: 97GU at 60°	●
T48024798-MRC	Mirror Gloss Calibration Tile	Nominal Value: 1900GU at 20°	●
T48024798-SH	Soft Material Specimen Holder, complete with 3 sample trays		
T48025004	Soft Material Sample Trays (x3)		
T99923535	Gloss Tile Cleaning Cloth		
T99925002	USB Cable		



Each calibration tile is supplied within its own base unit to ensure measurement accuracy.



The soft material specimen holder is supplied with 3 sample trays - ideal for testing soft, powder or viscous materials.



● Certificate supplied as standard.

* Supplied with gauge

elcometer®

Gloss & Colour



Gloss & Haze Measurement 14-2

Colour 14-12

Elcometer 6085

Portable Sphere Spectrophotometer







The Elcometer 6085 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 and portable
- Diffuse/8° sphere optical geometry
- Fixed 8mm aperture
- Large, easy-to-read high resolution graphical colour LCD display
- Opacity and colour strength measurement
- Simultaneous measurement of both specular components included and specular component excluded
- Rugged construction
- Reliable detent lock
- Rechargeable battery for portable use

Product Features

- **Measuring Functions and Indices**
  The Elcometer 6085 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 1,000 standards with tolerances for easy pass/fail measurement. A simplified green tick shown on screen shows a straight forward pass indication or a red cross shows a fail. Results are shown at a glance giving detailed colour comparison data for analysis.
- **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 6085'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 6085 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 6085 allows simultaneous measurement of both specular-included (colour) and specular-excluded (appearance).
- **User friendly Ergonomics**
  In addition to onboard programmes to assist the operator in the measurement process, the instrument itself is highly user-friendly. It is compact and lightweight with an ergonomic overmold design that provides a smooth and comfortable grip. The flip-back shoe is designed to withstand heavy use and has a reliable detent lock. Read-outs are large and easy to see with a high resolution colour LCD screen. A rechargeable battery pack allows extended operation of the instrument.

Elcometer 6085 Portable Sphere Spectrophotometer

Technical Specification

Part Number	Description	Certificate
K6085M001	Elcometer 6085 Ci60 Portable Sphere Spectrophotometer	●
K6085M002	Elcometer 6085 Ci62 Portable Sphere Spectrophotometer	●
Measuring Geometrics	d/8°, DRS spectral engine, fixed 8mm aperture Simultaneous SPIN / SPEX	
Light Source	Gas filled tungsten lamp	
Illuminant Types	A, C, D50, D55, D65, F2, F7, F11 & F12	
Standard Observers	2° and 10°	
Spectral Range	400-700nm	
Memory	1,000 standards with tolerances, 4,000 samples	
Measurement Range	0 to 200% reflectance	
Measuring Time	Approximately 2 seconds	
Inter-Instrument Agreement (Ci60)	CIE L*a*b*: Avg. 0.40 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Max. 0.60 ΔE*ab on any tile (specular component included)	
Inter-Instrument Agreement (Ci62)	CIE L*a*b*: Avg. 0.20 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Max. 0.40 ΔE*ab on any tile (specular component included)	
Short-term Repeatability[1]	Ci60 - 0.10 ΔE*ab on white ceramic (standard deviation) Ci62 - 0.05 ΔE*ab on white ceramic (standard deviation)	
Lamp Life	Approximately 500,000 measurements	
Power Supply	Removable battery pack; 7.4 VDC, 2400 mAh	
Measurements per Charge	1,000 measurements within 8 hour period	
Weight	1.05kg (2.32lbs.)	
Screen Display	3.2 inch backlit Colour Graphic LCD	
Dimensions	109 x 91 x 213mm (4.3 x 3.6 x 8.4”)	
Packing List	Elcometer 6085 Ci60, calibration standards, calibration certificate for standards, AC adaptor, mains leads (UK & EUR), carry case & operating instructions	
Packing List	Elcometer 6085 Ci62, calibration standards, calibration certificate for standards, AC adaptor, mains leads (UK & EUR), carry case & USB cable, operating instructions	

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

[1] Based on 20 measurements on a white tile

● Certificate supplied as standard.


elcometer®



Coating Flaws

Pinhole & Porosity

15



Premature corrosion of a substrate is usually due to a coating failure. A major cause is the presence of flaws in the finished coating.

Pinholes are 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.

The Wet Sponge Technique/Pinhole Detector is where 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.

Elcometer 270 Pinhole Detector

The **Elcometer 270** sets the standard for wet sponge, high quality, low voltage detectors which are supplied with a wide range of accessories to meet your requirements.

- Each unit can be converted into a separate wand with a base unit using the separate wand adaptor
- 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
- User selectable voltages: 9V, 67.5V or 90V
- Visual and audible alarms indicate a pinhole
- A wide range of wand accessories available



etv video available elcometer.tv

STANDARDS:

AS 3894.2, ASTM D 5162-A, ASTM G6, ASTM G62-A, BS 7793-2, ISO 14654, ISO 29601:2011, ISO 8289-A, JIS K 6766, NACE RP 0188, NACE SP 0188, NACE TM0384

Elcometer 270 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



Telescopic wand adaptor T27016998
with belt clip - extends to 1m (39"), ideal for floors or high areas

Separate wand adaptor T27016999
with belt clip - converts the gauge into a separate pinhole detector



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 connection plug

T99916996

Return cable - 10m (32')
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	Certificate
Part Number	D270----3	D270----4	
Part Number with Certificate	D270----3C	D270----4C	●
Voltage	9V and 90V	9V, 67.5V and 90V	
Coating Range (Max)	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	
Battery Type	3 x AA batteries (rechargeable batteries can also be used, but 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 supplied as standard.

elcometer®

For all your Protective Coatings Inspection Equipment visit

protective.elcometer.com





Inspection Kits & Accessories





Elcometer offers one of the widest range 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.

These kits can be customised to meet your particular requirements, please contact your distributor for further information.

Elcometer offers a full range of accessories specifically for the coatings inspector, these include:

Inspection Mirrors: 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.

Magnifiers & Microscopes: for close up investigations, the inspector may require magnification of the surface for a clearer understanding.

Automotive Inspection Kit

- Ideal for the automotive aftermarket these kits provide an instant measure of coating thickness of panels and allow close inspection of bodywork.
- See page **16-4**



Powder Coating Inspection Kit

- Designed to cover all surface inspection, coating thickness and adhesion testing requirements throughout the powder coating inspection process.
- See page **16-5**



Qualicoat Inspection Kit

- The Elcometer Qualicoat Powder Coating Inspection Kit provides various test instrumentation required to meet the high standards of this organisation.
- See page **16-6**



Pinhole Detection Inspection Kit

- The high quality Elcometer 270 Pinhole Detector Inspection Kits sets the standard for low voltage, wet sponge pinhole detection.
- See page **16-7**



Duct Deposit Measuring System

- The Elcometer Duct Deposit Measuring System helps monitor the build-up of deposits in order to maintain hygiene standards and reduce fire risks in heating and ventilation systems.
- See page **16-8**



Inspection Accessories

- From microscopes to magnifiers, paint safe markers to inspection mirrors, Elcometer has a full range of accessories to meet your inspection requirements.
- See page **16-9**



Elcometer

Automotive Inspection Kit



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. To enable close inspection of bodywork an illuminated magnifier is supplied.

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 137	LED Illuminated Magnifier (x10)	■	■	16-10
Elcometer 311	Automotive Paint Meter	■	■	7-47
Elcometer 214L	Infrared Digital Laser Thermometer		■	8-14

Individual Instruments can be used in accordance with many other tests.
Please see individual Product Information Pages for details.

Technical Specification

Part Number	Description
YKIT-AUTOMOTIVE-1	Elcometer Automotive Inspection Kit 1
YKIT-AUTOMOTIVE-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)

Elcometer

Powder Coating Inspection Kit



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

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.

The digital Elcometer 415 is suitable for measuring the coating thickness on smooth surfaces and the Elcometer 1542, designed for testing the adhesion of the coating, are also included.

Measurement parameters include:
- Surface inspection
- Coating thickness
- Adhesion

Contents

Model	Description	Page
Elcometer 137	LED Illuminated Magnifier (x10)	16-10
Elcometer 415	Powder Coating Thickness Gauge	7-44
Elcometer 1542	Cross Hatch Cutter 6 x 2mm with ISO or ASTM Adhesive Tape	12-24

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)

Elcometer

Qualicoat Powder Coating Inspection Kit



The Qualicoat Organisation brings together the ideals of several National Coating Associations into one quality label for powder coatings on aluminium architectural components. Qualicoat has established Specifications defining minimum requirements for plant, test equipment, coating materials and finished products.

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
- Oven temperature
- Coating thickness
- Adhesion

Bluetooth® wireless technology

compatible with ElcoMaster®

Contents

Model	Description	Basic	Top	Page
Elcometer 480	Statistical Glossmeter: 60°	Model B	Model T	14-5
Elcometer 1506	Mandrel Bend Tester with 5mm and 8mm (0.20 and 0.31") Mandrels	■	■	11-4
Elcometer 1615	Base Unit and Tube Assembly	■	■	11-7
Elcometer 1615	Kit B: ISO 6272/2 and BS 6496	■	■	11-9
Elcometer 1620	Manual Cupping Tester with Digital Gauge	■	■	11-6
Elcometer 215	Oven Data Logger and Kit*	Standard	Top	9-3
Elcometer 415	FNF Integral Digital Coating Thickness Gauge for smooth surfaces	■		7-44
Elcometer 456	FNF Separate Digital Coating Thickness Gauge		Model T	7-16
Elcometer 456	Standard FNF 1 Probe, 0 - 1500µm		■	7-29
Elcometer 1542	Cross Cut Set 6 x 1, 2, 3mm with ISO and ASTM Adhesive Tape	■	■	12-24

Individual Instruments can be used in accordance with many other tests.
Please see individual Product Information Pages for details.

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.

Elcometer 270

Pinhole Detection Inspection Kit







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

The Elcometer 270 Pinhole Detector 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:

Part Number	Description
D270----3	Elcometer 270/3 Pinhole Detector (9V & 90V)
D270----4	Elcometer 270/4 Pinhole Detector (9V, 67.5V & 90V)

For more information see page 15-3.

Technical Specification

Part Number	Description
T27018191	Elcometer 270 Pinhole Detector 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, 3 x AA batteries, spare flat sponge, spare roller sponge

The kit does not include the main instrument; 15-3 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

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 off the deposit thickness on a specific test area, before and after cleaning.

ElcoMaster® Software, supplied as standard with the Elcometer 456 Duct Deposit Measuring System includes a template designed specifically for reporting duct deposit measurements.

Bluetooth® wireless technology

compatible with ElcoMaster®

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	Certificate
A456CDUCT	Elcometer 456 Duct Deposit Measuring System	○
Measurement Range	0 - 1500µm (0 - 60mils)	
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® Software, 2 x AA batteries, wrist harness, carry case and operating instructions	

Accessories

T456CF2B	Elcometer 456 Duct Probe
T99913939	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

○ Optional Calibration Certificate available.

Elcometer 131

Inspection Mirrors



Ideal for inspecting difficult to access areas - behind corners and 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
Dimensions	Extends from 520mm (20.5”) to 1500mm (59”) Mirror diameter: 63mm (2.5”)
Weight	650g (1.43lb)
Packing List	Elcometer 131 Inspection Mirror



Part Number	Description
H131---1B	Elcometer 131/1B Telescopic Inspection Mirror
Dimensions	Extends from 165mm (6.5”) to 925mm (36”) Mirror diameter: 57mm (2.25”)
Weight	100g (0.22lb)
Packing List	Elcometer 131 Inspection Mirror



Part Number	Description
H131---1C	Elcometer 131/1C Telescopic Inspection Mirror
Dimensions	Extends from 165mm (6.5”) to 750mm (29.5”) Mirror diameter: 82mm (3.25”)
Weight	100g (0.22lb)
Packing List	Elcometer 131 Inspection Mirror

Elcometer 137

LED 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 LED illuminated magnifier is the ideal product for the job as many environments can be in low light or dark areas.

- 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 LED Illuminated Magnifier
Battery Type	2 x LR14 (C)
Dimensions	33 x 215mm (1.3 x 8.5")
Weight	236g (0.52lb)
Packing List	Elcometer 137 LED Illuminated Magnifier, 2 x LR14 (C) batteries and operating instructions

Elcometer 7210

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	2 x AA batteries
Dimensions	140 x 50 x 22mm (5.5 x 2 x 0.9")
Weight	68g (0.14lb)
Packing List	Elcometer 7210 Pocket Microscope, 2 x AA batteries and operating instructions

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 AAA battery		
Dimensions	120 x 43 x 115mm (4.7 x 1.7 x 4.5”)	Weight	145g (0.31lb)
Packing List	Elcometer 900 Illuminated Microscope and operating instructions		

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 pens have been specially selected for use as inspection markers for all types of large steel fabrications.

The black permanent ink marker pens are ideal for marking in the most sensitive areas.

Technical Specification

Part Number	Description
H144----1	Elcometer 144 Paint Safe Marker Pens (pack of 5)

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Black Polo Shirt



Technical Specification

Part Number	Size	Chest	Height
MT29173-S	Small	84-92cm (33-36")	164-170cm (5'5"-5'7")
MT29173-M	Medium	92-100cm (36-38")	170-176cm (5'7"-5'9")
MT29173-L	Large	100-108cm (38-42")	176-182cm (5'9"-6'0")
MT29173-XL	X-Large	108-116cm (42-45")	182-188cm (6'0-"6'2")
MT29173-2XL	XX-Large	116-124cm (45-49")	188-194cm (6'2"-6'6")
MT29173-3XL	XXX-Large	124-132cm (49-52")	194-200cm (6'6"-6'8")

Elcometer

Black Soft Shell Jacket



Technical Specification

Part Number	Size	Chest	Height
MT29166-S	Small	84-92cm (33-36")	164-170cm (5'5"-5'7")
MT29166-M	Medium	92-100cm (36-38")	170-176cm (5'7"-5'9")
MT29166-L	Large	100-108cm (38-42")	176-182cm (5'9"-6'0")
MT29166-XL	X-Large	108-116cm (42-45")	182-188cm (6'0"-6'2")
MT29166-2XL	XX-Large	116-124cm (45-49")	188-194cm (6'2"-6'6")
MT29166-3XL	XXX-Large	124-132cm (49-52")	194-200cm (6'6"-6'8")

Elcometer

Black Baseball Cap



Technical Specification

Part Number	Description
MT29158	Baseball Cap - One Size

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For all your NDT Inspection Equipment visit ndt.elcometer.com




econeer®

ElcoMaster®
Data Management



17

ElcoMaster® - as easy as 1, 2, 3!

From inspection to professional reports at the click of a button.

1

Take Readings

It's not all about taking readings, but what you do with the collected data that matters. ElcoMaster® Software is a fast, easy to use software and mobile app for all your data management, reporting and quality assurance needs.





2

Send to ElcoMaster®

ElcoMaster® Software transfers measurement data direct from Elcometer's Bluetooth® or USB enabled inspection gauges direct to your PC, mobile or tablet.

All your measurement data in one place



Coating Thickness



Precision Thickness



Climatic Conditions

It's not all about taking readings, it's what you do next that counts. Save up to 30% of your working week by producing professional inspection reports in seconds by using ElcoMaster® Software.

3

Create Professional Inspection Report in Seconds

Inspectors can spend up to 30% of their working week producing reports. ElcoMaster® Software saves time and money by producing professional bespoke reports - even when they are out on site.



compatible with ElcoMaster®



Gloss Measurement



Oven Data Logging*



Adhesion Testing

*USB connection only

Professional reports in seconds even when out on site. The **ElcoMaster® Software App** puts the office in your pocket.



When on site, you can review data using our free ElcoMaster® Software Mobile App. Press 'Generate PDF' and watch the ElcoMaster® Software App produce a professional report instantly.

Email the report to your client seconds after you have finished inspecting or upload it via cloud technology so it can be accessed anywhere in the world.

Email, print or send
Export, print, .pdf or email directly from ElcoMaster® Software at the click of a button.

Easy to connect
Connect multiple gauges at the same time using Bluetooth® to download data from a gauge's memory or record live readings.

Analyse
Analyse data and statistics, complete with measurement parameters such as adhesion pull-graphs and failure attributes or salt density maps instantly.



ElcoMaster®

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.

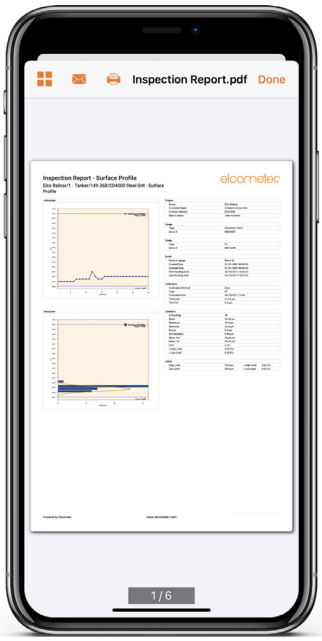
Download on the App Store

GET IT ON Google Play

Easy to use
Store all project data, documents and reports in easy to manage folders.

Live Readings & Statistics
Record each individual reading as it is taken and save it into batches. Ideal for gauges without an internal memory.

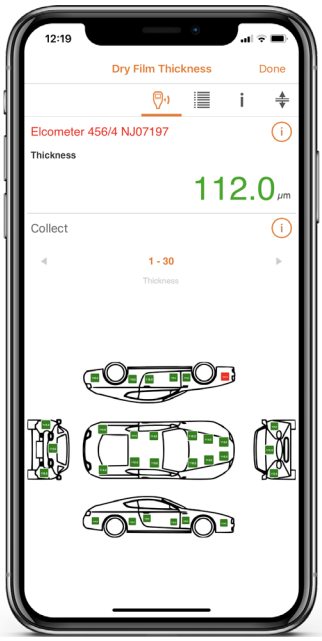
Collection Templates
Using measurement location points on images or photos to indicate the position for the next reading.

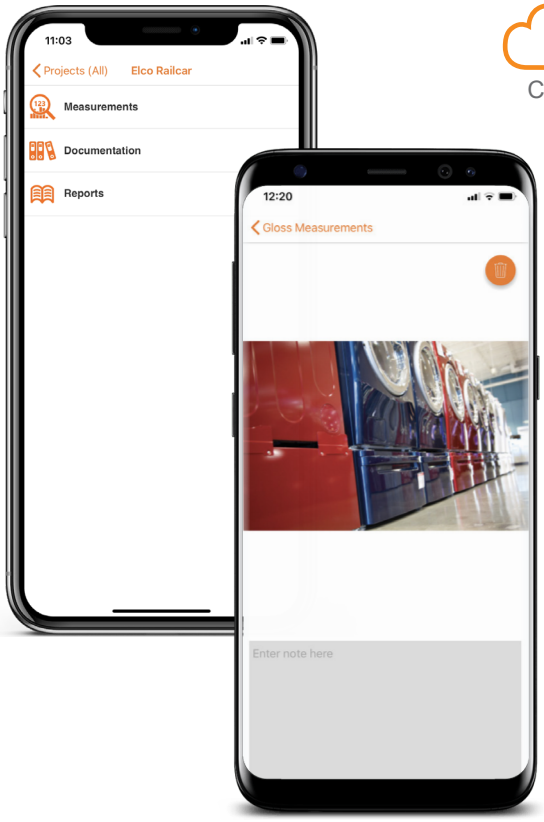


GPS
Store GPS locations in batches and view location on Google Maps.

Add Photos & Notes
Take photos, add notes and comments.

Combine
Combine multiple inspection parameters (DFT, climate, adhesion & gloss) into bespoke reports.





Cloud Email



ElcoMaster® Software is the easy to use PC and mobile app for all your data management, reporting and quality assurance needs.

- No need to learn different software for different gauges, all Elcometer products use the same expert platform.
- Store data in a simple file tree, by project or by inspection type.
- Easy on screen analysis with histograms, statistics, measurements, limits, notes, diagrams and photographs.
- Export data direct to Microsoft Excel, .csv, .txt, Cqatk formats, etc., to save time and prevent keying in errors.
- Generate reports instantly using standard or pre-designed templates.
- No need for data manipulation, simply connect the gauge, download data and drag & drop.
- Combine multiple inspection parameters (such as DFT, climate, adhesion and gloss) with images, notes and other project specific information in bespoke quality reports.
- Combine different inspection parameters to approve the final product.
- Using Cloud technology ElcoMaster® Software gives you real time quality control monitoring inspection projects in any location.

Easy to connect multiple gauges
Connecting a gauge & downloading data (via Bluetooth® or USB) is fast and easy

Easy to use
Store data in a simple file tree, by project and by inspection type

Combine
Combine multiple inspection parameters (DFT, climate, profile, adhesion, gloss & salt contamination) into bespoke reports



Products ElcoMaster® Software is compatible with:

Create reports by importing and combining measurements using Bluetooth® or USB from a wide range of Elcometer gauges, including;

- Climatic Conditions
- Coating Thickness
- Adhesion Testing
- Oven Data Logging
- Material Thickness
- Gloss Measurement

Email, print or send
Export, print, .pdf or email directly from ElcoMaster® Software at the click of a button

Import existing reports
Scan your existing report into ElcoMaster® Software and drag & drop all your data where you want it, then simply save and print

Built-in template
ElcoMaster® Software Library with FREE Report, Collection, Limit & Standards Templates



Export direct
Export data direct to Microsoft Excel, .csv, .txt, cqatk formats, etc., to save time and prevent keying in errors

Analyse
Analyse data using sequential readings, statistics, batches, charts, graphs, and histograms

Live readings & statistics
Record each individual reading as it is taken and save it into batches. Ideal for gauges with no internal memory

Add photos & notes
Add photographs and notes to your reports

From inspection site, to Cloud and Client in real time - the different ways **ElcoMaster® Software** can help you.

1 Transfer your readings



Transfer your inspection data to Microsoft Excel or ElcoMaster® Software via Bluetooth® or USB to create professional reports at the click of a button.

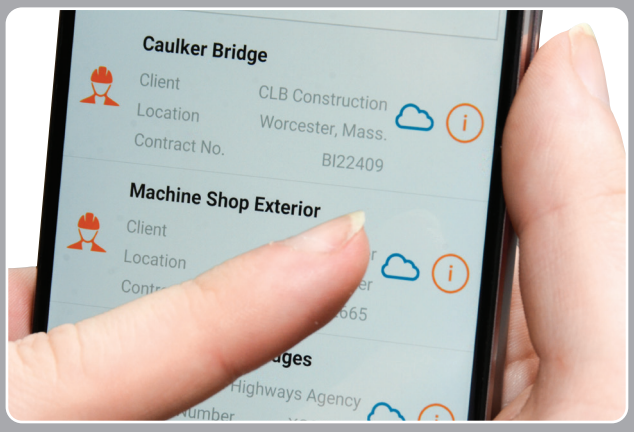
2 Transfer from site to office



Instantly transfer inspection data to your smartphone or tablet via Bluetooth®. Then send your data via email or convert to pdf and print.

3 Upload to a cloud

Using ElcoMaster® Software Mobile App, upload inspection data, photos, notes and GPS coordinates to a Cloud account of your choice via 3G/4G or WiFi.



All data is instantly visible to other approved users of the cloud account - through a secure login on any computer or mobile device anywhere in the world.



Compare and combine inspection data from different production lines or different locations, to produce specific Project Inspection Reports quickly and easily.

4 Real time collaboration for multi-site projects



When working with manufacturers of sub-assemblies across the globe ElcoMaster® Software 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.
- Improve efficiency and quality throughout the production process.

Real time communication

Add comments to inspection data, projects and files or instantly message your colleagues, managers or clients to immediately discuss key points, send work instructions and store messages within the project file.

Your data - your choice - your control

Using your preferred Cloud service provider, make your data secure allowing only approved users to have access. ElcoMaster® Software Mobile App is compatible with a range of cloud service providers and FTP servers.

ElcoMaster® Data Management - Oven Profiling

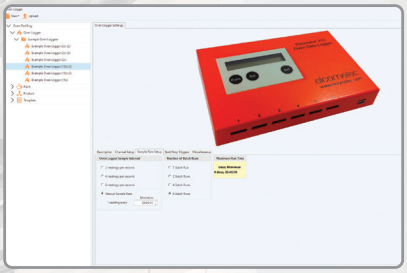
ElcoMaster®, the easy to use software designed specifically for the management and assessment of your temperature profile, generating professional inspection reports in seconds.

- Import photos, data sheets & inspection notes to include on inspection reports
- Overlay temperature profiles, review and compare multiple oven profiles over time
- Time above maximum absolute & minimum cross link temperatures
- Report generator wizard & PDF generator and email or export data
- Use additional data loggers for multiple channels or run overlays
- Selectable probe/channel traces
- Cloud computing - allows for cross site collaboration
- Records length of time at cure temperature, with date & time stamp



Oven Logger Set Up

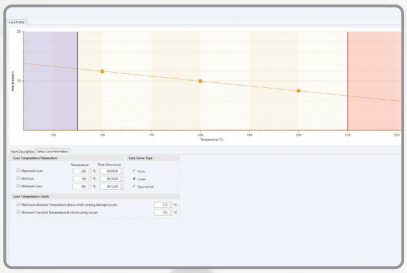
Create and store unique oven profile set ups and transfer them to the gauge.



Create and store unique oven profile set ups and transfer them to the gauge.

Graphical Reporting

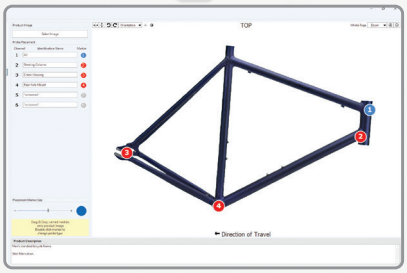
Standard temperature profile, cure process and product probe maps are available as standard.



Set up a library of individual paint parameters.

Product Probe Maps

Place probe ID markers on your product photo or drawing to record exact probe placement for each production run.



Individual product probe maps record the exact probe placement for each component.

Coating Parameters

Set up a library of individual paint types with min, mid and max cure temperatures.



Standard temperature profile and cure process graphs can be viewed at any time.

Combined Reports

Oven profile reports can be combined with data from coating thickness, gloss & adhesion gauges.

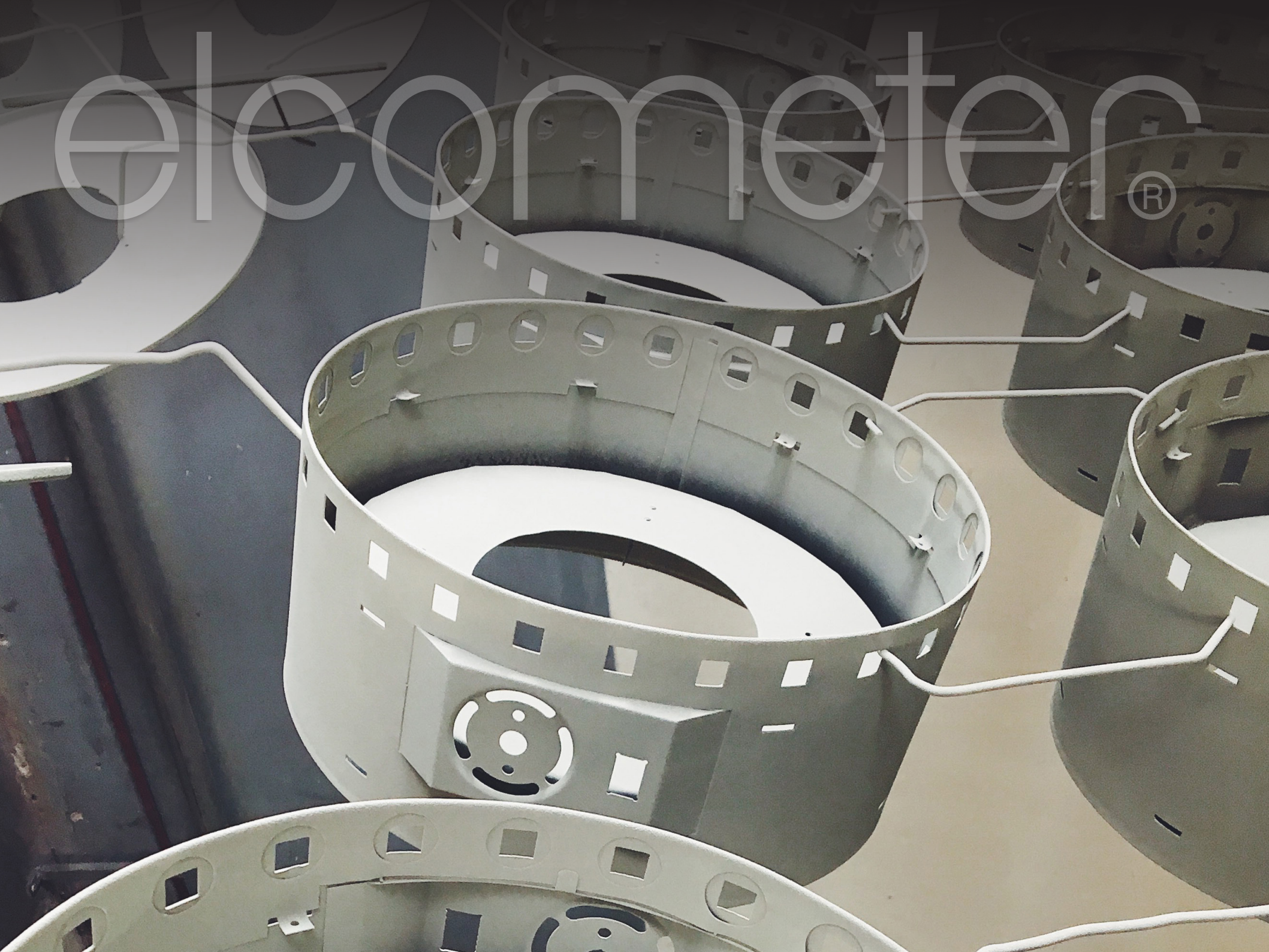


Statistical analysis by probe/channel.

Elcometer Cure Value

Instant pass/fail information compares the production run temperature to the coating supplier's cure requirements.

For information on the Elcometer 215 Oven Data Logger, see page 9-3


elcometer®



Standards & Index

18

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 the catalogue introduction. For the most up to date information, please refer to our website.

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AATCC			
AATCC Method 8	Washability	5750	13.9
ANSI			
ANSI INCITS 322	Washability	1700 & 1750	13.10
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AS 1580.408.4	Adhesion	107	12.22
AS 1580.408.5	Adhesion	106	12.15
AS 2331.1.4	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
AS 3894.2	Coating Flaws	270	15.3
AS 3894.3-B	Coating Thickness	456, 355	7.16, 7.50
AS 3894.4	Hardness	3092, 3101	10.4, 10.10
AS 3894.6-A	Surface Cleanliness	138/2	5.3
AS 3894.6-C	Surface Cleanliness	142	5.6
AS 3894.6-D	Surface Cleanliness	138/2	5.3
AS 3894.9	Adhesion	107	12.22
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AS/NZS 1580.107.3	Coating Thickness	115, 3238, 112AL	7.6, 7.6, 7.7
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AS/NZS 1580.108.1	Coating Thickness	311, 355	7.47, 7.50
AS/NZS 1580.204.1	Dispersion & Density	2020, 2050	1.3, 1.4
AS/NZS 1580.213.1	Film Application	Leneta	4.18
AS/NZS 1580.214.2	Viscosity	2350 & 2354 (cup 4)	2.4
AS/NSZ 1580.214.6:1995	Viscosity	2350 & 2354	2.4
AS/NZS 1580.402.1	Elasticity	1500, 1506	11.3, 11.4
AS/NZS 1580.403.1	Hardness	3000	10.6
AS/NZS 1580.403.2	Washability	1700 & 1750	13.10
AS/NZS 1580.406.1	Elasticity	1615	11.7
AS/NZS 1580.408.5	Adhesion	510, 506, 106	12.3, 12.12, 12.15
AS/NZS 1580.459.1	Washability	1720	13.3
AS/NZS 1580.601.3	Gloss & Colour	6085	14.13
AS/NZS 1580.602.2	Gloss & Colour	480	14.5
AS/NZS 4266.2	Washability	1700 & 1750	13.10
AS/NZS 4266.2	Washability	1700 & 1750	13.10
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ASME B46	Surface Cleanliness	7062	5.7
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ASTM B 499	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
ASTM B 648	Hardness	3101	10.10
ASTM C 1353	Washability	1700 & 1750	13.10
ASTM C 1583	Adhesion	510	12.3
ASTM C 217	Washability	1700 & 1750	13.10
ASTM C 241	Washability	1700 & 1750	13.10
ASTM C 501	Washability	1700 & 1750	13.10
ASTM C 584	Gloss & Colour	480	14.5
ASTM C 609	Gloss & Colour	6085	14.13
ASTM D 1044	Washability	1700 & 1750	13.10
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ASTM D 1200	Viscosity	2436 & 2437	2.7
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ASTM D 1212-B	Coating Thickness	3233	7.10
ASTM D 1316	Dispersion & Density	2070	1.5
ASTM D 1400	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
ASTM D 1455	Gloss & Colour	480	14.5
ASTM D 1475	Dispersion & Density	1800	1.6
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ASTM D 1653	Drying Time	5100	6.3
ASTM D 1737	Elasticity	1500, 1506	11.3, 11.4
ASTM D 1792 - 06	Washability	1720	13.3
ASTM D 2197	Washability	5750	13.9
ASTM D 2198 -02	Washability	1720	13.3
ASTM D 2240	Hardness	3120	10.11
ASTM D 2244	Gloss & Colour	6085	14.13
ASTM D 2457	Gloss & Colour	480	14.5
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ASTM D 2486	Film Application	Leneta	4.18
ASTM D 2486	Washability	1720	13.3
ASTM D 2583	Hardness	3101	10.10
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ASTM D 2805	Film Application	Leneta	4.18
ASTM D 3206 - 08	Washability	1720	13.3
ASTM D 3359-B	Adhesion	107	12.22
ASTM D 3363	Hardness	3080, 501	10.3, 10.4
ASTM D 3389	Washability	1700 & 1750	13.10
ASTM D 344	Film Application	Leneta	4.18
ASTM D 3450	Washability	1720	13.3
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ASTM D 3884	Washability	1700 & 1750	13.10
ASTM D 4039	Gloss & Colour	480	14.5
ASTM D 4060	Washability	1700 & 1750	13.10
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ASTM D 4414-A	Coating Thickness	112, 3236	7.5, 7.5
ASTM D 4414-A	Coating Thickness	115, 3238, 112AL	7.6, 7.6, 7.7

Standard	Reference	Elcometer Model	Page
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ASTM D 4541	Adhesion	508, 108	12.17, 12.19
ASTM D 4828	Washability	1720	13.3
ASTM D 5125	Viscosity	2350 & 2354	2.4
ASTM D 5125	Viscosity	2439 & 2437	2.7
ASTM D 5150	Film Application	Leneta	4.18
ASTM D 5162-A	Coating Flaws	270	15.3
ASTM D 5178	Washability	5750	13.9
ASTM D 522-A	Elasticity	1510	11.5
ASTM D 522-B	Elasticity	1500, 1506	11.3, 11.4
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ASTM D 5420	Elasticity	1615	11.7
ASTM D 6037	Washability	1700 & 1750	13.10
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ASTM D 6279 - 03(2007)	Washability	1720	13.3
ASTM D 6441	Film Application	Leneta	4.18
ASTM D 7091	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
ASTM D 7127	Surface Cleanliness	7062	5.7
ASTM D 7234	Adhesion	506	12.12
ASTM D 7234-12	Adhesion	510	12.3
ASTM D 7236	Flash Point	6910	3.3 - 3.8
ASTM D 7255	Washability	1700 & 1750	13.10
ASTM D 7378-A	Coating Thickness	155	7.11
ASTM D 823-C	Film Application	4340	4.3
ASTM D 823-E	Film Application	3520, 3525/3530	4.10, 4.11
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ASTM D 823-E	Film Application	3505, 3560	4.15, 4.15
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ASTM E 313	Gloss & Colour	6085	14.13
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ASTM E 376	Coating Thickness	311, 355	7.47, 7.50
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ASTM F 1319	Washability	1720, 5750	13.3, 13.9
ASTM F 1478	Washability	1700 & 1750	13.10
ASTM F 1978	Washability	1700 & 1750	13.10
ASTM F 362	Washability	1700 & 1750	13.10
ASTM F 510	Washability	1700 & 1750	13.10
ASTM G 12	Coating Thickness	456, 355	7.16, 7.50
ASTM G 6	Coating Flaws	270	15.3
ASTM G 62-A	Coating Flaws	270	15.3

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BS 2000-523	Flash Point	6910	3.3 - 3.8
BS 2842	Temperature	116	8.9
BS 3900 D5	Gloss & Colour	480	14.5
BS 3900 E4	Elasticity	1620	11.6
BS 3900-A6:1971	Viscosity	2350 & 2354	2.4
BS 3900-C5-6A	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
BS 3900-C5-6B	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
BS 3900-C5-7A	Coating Thickness	3230	7.8
BS 3900-C5-7B	Coating Thickness	112, 3236, 154	7.5, 7.5, 7.7
BS 3900-C5-7B	Coating Thickness	115, 3238, 112AL	7.6, 7.6, 7.7
BS 3900-D4	Film Application	Leneta	4.18
BS 3900-E1	Elasticity	1500	11.3
BS 3900-E11	Elasticity	1510	11.5
BS 3900-E13	Elasticity	1615	11.7
BS 3900-E2	Hardness	3000	10.6
BS 3900-E6	Adhesion	107	12.22
BS 3900-E9	Hardness	3095	10.9
BS 5411-11	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
BS 5411-3	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
BS 5599	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
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BS 6496:1984	Elasticity	1615	11.7
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BS 7442-3.2	Hardness	3120	10.11
BS 7479	Hardness	1537	10.12
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DIN 5033-3	Gloss & Colour	6085	14.13
DIN 5033-4	Gloss & Colour	6085	14.13
DIN 5033-7	Gloss & Colour	6085	14.13
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DIN 50984	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
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DIN 53109	Washability	1700 & 1750	13.10
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DIN 53153	Hardness	3095	10.9
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DIN 53162-2	Film Application	Leneta	4.18

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DIN 53203	Dispersion & Density	2050	1.4
DIN 53211	Viscosity	2350, 2435	2.4, 2.7
DIN 53217-2	Dispersion & Density	1800	1.6
DIN 53232	Elasticity	1620	11.6
DIN 53505	Hardness	3120	10.11
DIN 53754	Washability	1700 & 1750	13.10
DIN 53778-2:1983	Washability	1720	13.3
DIN 53799	Hardness	3000	10.6
DIN 53799	Washability	1700 & 1750	13.10
DIN 6174	Gloss & Colour	6085	14.13
DIN 67530	Gloss & Colour	480	14.5
DIN 68861-2	Washability	1700 & 1750	13.10
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ECCA T1	Coating Thickness	456, 415, 355	7.16, 7.44, 7.50
ECCA T11	Washability	1720	13.3
ECCA T12	Hardness	3000	10.6
ECCA T16	Washability	1700 & 1750	13.10
ECCA T2	Gloss & Colour	480	14.5
ECCA T4	Hardness	3080, 501	10.3, 10.4
ECCA T5	Elasticity	1615	11.7
ECCA T6	Elasticity	1620	11.6
ECCA T6	Adhesion	107	12.22
EN			
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EN 12373-11	Gloss & Colour	480	14.5
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EN 13523-11	Washability	1720	13.3
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EN 13523-2	Gloss & Colour	480	14.5
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EN 233/C3.2-B	Washability	1720	13.3
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EN 438-2	Washability	1700 & 1750	13.10
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EN 660-2	Washability	1700 & 1750	13.10
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P-R-1760	Washability	1720	13.3
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IMO MSC.244 (83)	Coating Thickness	456, 355	7.16, 7.50
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ISO 14656	Washability	1700 & 1750	13.10

Standard	Reference	Elcometer Model	Page
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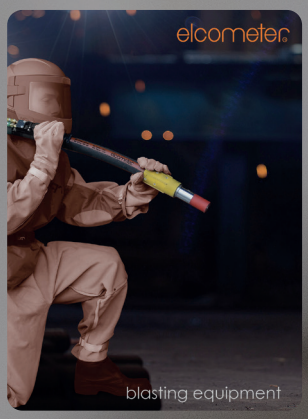









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