elcometer®

Inspection
Equipment

Welcome to Elcometer

For over 50 years Elcometer has been a world leader, not only in the manufacture and supply of inspection equipment to the coatings industry, but also in the design and development of new products specifically to meet our customers' requirements.

As part of its ongoing expansion in 2003 Elcometer consolidated their world leading position with the acquisition of two of Europe's premier high quality design and manufacturing organisations in the paint, coatings and concrete industries.

These acquisitions place Elcometer as perhaps the largest manufacturer and supplier of inspection equipment to the markets we serve - allowing scale and scope for increased manufacturing and distribution efficiencies.

With seven offices positioned in key markets around the world, Elcometer not only continues their tradition of quality and value, but also enhance their high level of technical support, customer service and product availability when and where you need it the most.

How to use this catalogue

Elcometer's extensive product range now includes:

- Coating Physical Test Equipment
- Coating Inspection Equipment
- Concrete Inspection Equipment
- Industrial Metal Detectors
- Multiplexers and SPC

With such a wide range of products available, this catalogue has been arranged in the order of how the equipment would be used within the relevant industry. Primarily used for coating development, Physical Test Equipment is positioned before Coating Inspection Equipment - which is used during and after application.

Furthermore, in each section, the products have been arranged in the order of use. For example, adhesion testing equipment follows coating thickness instrumentation.

Many instruments are common across more than one sector. In these cases, the product is included in the most appropriate area and is identified in the contents page as well as being cross referenced within the catalogue.

Elcometer and the web

For additional information, including latest product releases, free software, technical information, which exhibitions we will be attending, or to register for our free technical magazine, please visit our website – **www.elcometer.com**

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Why choose Elcometer?

The philosophy of Elcometer since its inception in 1947 has always been to provide you with 'best in class' product design, product quality and service at a competitive price. By concentrating on these core values Elcometer has grown into a worldwide organisation with dedicated offices in seven countries and distribution outlets in more than 150 locations around the world.

Technical Capability – engrained in our history

For more than 50 years Elcometer has been at the forefront of the Coating Inspection Industry. This involvement has also included presence on Standards Committees in many areas around the world. During this time many class-leading products have been designed and manufactured by Elcometer.

With the introduction of the new range of Coating Physical Test equipment and the new 'Protovale by Elcometer' Concrete Inspection products Elcometer has taken a further step in meeting the total needs of the inspection marketplace.

Research and Development

Elcometer commits major resources to Research and Development. With departments in both the UK and Belgian facilities, Elcometer are able and capable of exploring and exploiting new and exciting areas of product development. This culminates in the capability to offer products which exceed customer expectations.

Innovation

Elcometer has had an enviable reputation for innovation since 1947 when the world's first mechanical coating thickness gauge was developed. This still holds true today and with recently released products such as the enhanced, simpler to use Elcometer 456 Coating Thickness Gauge and the new market-leading Elcometer 270 Pinhole Tester the reputation of Elcometer grows from strength to strength.

Quality – a culture, not just about the products

Elcometer's commitment to quality is reflected in our ISO 9001 Quality and ISO 14001 Environmental certifications.

However systems are only as good as the people who work with them and at Elcometer quality is a culture. The Company philosophy is to design quality into the product at the concept and development stage. This includes an environmental assessment of everything that Elcometer does – right down to this catalogue.

This culture ensures that the product reaching the customer maintains the reputation that Elcometer has worked for so long to achieve.

With facilities working to Kanban and Just in Time (JIT) methodology Elcometer's manufacturing can also justifiably claim to be best in class.

Service - not just 'after sales' support!

Elcometer's Service concept includes:

Product Sales:

Elcometer never tries to 'oversell' a product that is not fit for purpose. The philosophy is to cultivate and maintain customer relationships on a long-term basis. This ensures the continuity of the company.

To cultivate this, Elcometer Sales Personnel are carefully trained in the application of the entire product range. This ensures that you, the customer, will be offered the product best suited for your purpose.

Application Support:

With products being designed within the organisation, Elcometer can offer a bespoke Application Advice and Support Service. This includes bespoke Product Sample Reports, advice on instrument application and problem solving available from our Technical Support help lines.

Customer Product Training:

Even with carefully written Instruction Manuals there is an important need for Elcometer to offer after sales product training. Such training can be carried out either at an Elcometer office or at your chosen location. With highly trained Technical Sales Personnel Elcometer prides itself in offering this service to our customers.

To support you with any technical enquiry Elcometer have technical help desks operating in the UK, Belgium, France, Germany, Singapore and USA. There is therefore almost always an Elcometer office open somewhere in the world to handle your technical enquiry.

Product Service and Repair:

From time to time even the best-engineered and manufactured products require service or repair. The Elcometer worldwide office network supports you. With repair centres in the UK, Belgium, Singapore and USA you are never far away from help.

Elcometer also prides itself in being capable of supporting an extensive selection of the historic product range. For example instruments purchased more than 30 years ago are still able to be serviced!

Elcometer also offers a comprehensive instrument calibration and certification service applicable to almost all of the products within the range. This service ensures that your instruments continue to meet the relevant National and International Standards.

Personnel Training:

To compete in the world marketplace Elcometer believe it is important to recruit and train not only the best people but also to ensure that all staff are developed to the best of their capabilities. This involves a structured training program which ultimately ensures that you, the customer, are supported in the most professional way.

Customer Satisfaction:

All of the above is as a result of interaction with you, our customer. Elcometer's business is built on the foundation of listening to the marketplace. It is therefore vital that Elcometer continues to listen to your feedback. From time to time you may receive follow-up communication which monitors your views. Please therefore help us to improve our service by providing answers to those questions.

Value for Money

In the present competitive environment none of the above would matter unless Elcometer were price competitive. By constantly striving for optimised product design, lower costs, more efficient manufacturing and economical distribution, Elcometer's strategy is to remain the industry benchmark.

It is vital to the market that value for money is seen to be competitive. Elcometer have worked very hard to create a meaningful price structure for the new Physical Test and Concrete Inspection product lines.

Product Range – much more than just a Coating Thickness Gauge

The recent investment in Physical Test Equipment has enabled Elcometer to become a world-leading supplier of a comprehensive range of instrumentation and test equipment for the Coatings Industry.

The introduction of the 'Protovale by Elcometer' range of Concrete Inspection Equipment and Metal Locators allows the company to develop further into the Construction Industry.

Our 'Dataputer by Elcometer' range of Multiplexers, Statistical Process Control Software and Data Loggers provides customers with cutting edge products for the control of their manufacturing process improving their quality and helping to reduce waste.

The publication of this Product Catalogue is intended to allow you to clearly identify those products that are relevant to you and your Industry.

Worldwide Presence – a Global Organisation

In order to satisfy the demands of the global market it is Elcometer's strategy to be represented in all major markets worldwide.

To achieve this Elcometer now have seven wholly owned offices around the world which are dedicated to providing you, our customer, with a solution to your inspection needs.

These offices, together with an additional international network of more than 150 stock holding distributors, ensure that Elcometer are available locally to both you and your customers whatever your industry or application.

Manufacturing in two countries also provides us with the flexibility to tailor our output to meet world demand, further optimising our service to you.

Elcometer – UK

Elcometer – USA

Elcometer – Belgium

Fineness of Grind

From the development of coatings and inks in the laboratory to testing during the production process, quick and precise measurement of the particle size of the material – be it pigments or other similar materials – is one of the essential measurement techniques required for reliable and repeatable results.

Fineness of grind gauges comprise of stainless steel blocks in which either one or two channels are 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.

Elcometer take special care in their manufacturing to ensure that the highest level of precision and quality is maintained for all their 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 the cosmetics industry.

Elcometer 2000 Muller Laboratory Grinder

The Elcometer 2000 is a particularly sturdy machine, enabling optimal and perfectly reproducible grinding and dispersions to be obtained in the laboratory.

The grinding is carried out by two ground glass discs. The fixed upper disc is the part of the system for adjusting operating force between 5 and 100kg (11 and 220lbs) and is fitted on a cranked arm to make it easier to open. The bottom plate rotates at 100rpm. The movement is provided by a powerful geared motor system capable of carrying out tests under extreme conditions.

The whole grinder is built into a housing made of thick steel plates. One counter counts the number of revolutions and automatically stops the motor. Another shows the total after each test cycle.

Can be used in accordance with:	
ASTM D 387	ASTM D 332
ISO 8780-5	ISO 787/16
NFT 30 023	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 2000	Elcometer 2000 Muller Laboratory Grinder	K0UK2000M001	K0002000M001	K0US2000M001
Accessories	Frosted Glass (2 pieces)	KT002000P001		
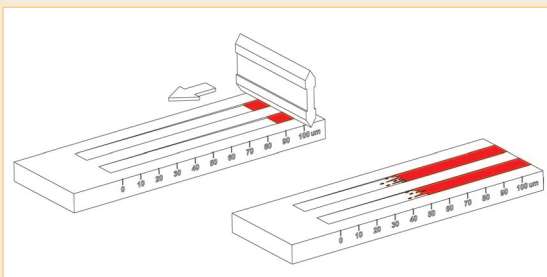
How to use a Fineness of Grind Gauge

The material is placed on the lowest (deepest) part of the groove and, using the scraper provided, drawn up the slope in the opposite direction.

The place where a large number of particles appears indicates the particle size.

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Elcometer 2020 & 2041 Fineness of Grind Gauges – Hegman, North & PCU

Precision instruments, used to determine particle size and fineness of grind of many materials including paints, pigments, inks, coatings, chocolates and other similar products.

The gauge and its scraper are made of hardened stainless steel and have one or two grooves with a graded slope (dependent on the model chosen), graduated in microns, mils, NS (Hegman) or PCU (North), the gauges have a tolerance of ±2µm.

Elcometer 2041: The Basic design of the gauge shows lateral graduations only on the side of the gauge.

Elcometer 2020: The Standard Gauge, shows graduations in microns, NS and PCU indicated on the top of the gauge.

Can be used in accordance with:	
ASTM D 1210	ASTM D 1316
DIN 53203	DIN EN ISO NF 21524
FTMS 141 a M.4411.1	ISO 1524
NFT 30 046	

Model	Range				Specifications							Part Number	
	µm	mils	Hegman (NS)	North (PCU)	Number of Grooves	Groove Width		Groove Length		Graduation		Metric	Imperial
						mm	inches	mm	inches	µm	mils		
Elcometer 2041/1	0-15	-	-	-	2	12	0.47	127	5.0	1	-	K0002041M001	-
Elcometer 2041/2	0-25	0-1	-	-	2	12	0.47	127	5.0	2.5	0.1	K0002041M002	K0US2041M002
Elcometer 2041/3	0-50	0-2	-	-	2	12	0.47	127	5.0	5	0.2	K0002041M003	K0US2041M003
Elcometer 2041/4	0-100	0-4	-	-	2	12	0.47	127	5.0	10	0.5	K0002041M004	K0US2041M004
Elcometer 2020/3	0-15	-	8-7	10-9	2	12	0.47	127	5.0	1	-	K0002020M003	-
Elcometer 2020/4	0-25	0-1	8-6	10-8	2	12	0.47	127	5.0	2.5	0.1	K0002020M004	K0US2020M004
Elcometer 2020/1	0-50	0-2	8-4	10-5	2	12	0.47	127	5.0	5	0.2	K0002020M001	K0US2020M001
Elcometer 2020/2	0-100	0-4	8-0	10-0	2	12	0.47	127	5.0	10	0.5	K0002020M002	K0US2020M002
Accessories	Replacement Scraper for 2 grooves											KT002020N001	KT002020N001

Elcometer 2050 High Precision Grindometer

Precision instruments used to determine particle size and fineness of grind of many materials, including paints, pigments, inks, coatings, chocolates and other similar products.

The gauge and its scraper are made of hardened stainless steel, and are graduated in microns on the top to an accuracy of ±1µm.

Tolerance: ±1µm.

Can be used in accordance with:	
ASTM D1210	ASTM D1316
DIN 53203	DIN EN ISO NF 21524
FTMS 141 a M.4411.1	ISO 1524
NF T 30 046	

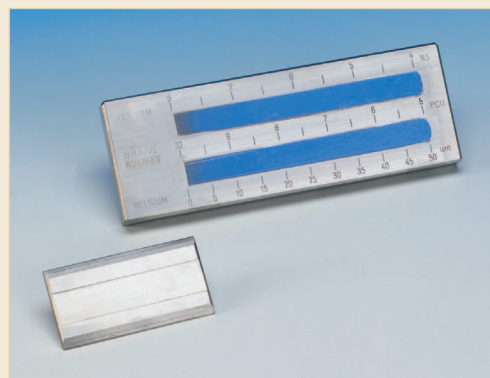| Model	Range		Specifications							Part Number	
	µm	mils	Number of Grooves	Groove Width		Groove Length		Graduation		Metric	Imperial
				mm	inches	mm	inches	µm	mils		
Elcometer 2050/1	0-25	0-1	1	12	0.47	200	7.87	1	0.05	K0002050M001	K0US2050M001
Elcometer 2050/2	0-50	0-2	1	12	0.47	200	7.87	2	0.1	K0002050M002	K0US2050M002
Elcometer 2050/5	0-100	0-4	1	12	0.47	200	7.87	5	0.2	K0002050M005	K0US2050M005
Elcometer 2050/8	0-250	0-9	1	12	0.47	200	7.87	12.5	0.5	K0002050M008	K0US2050M008
Accessories	Replacement Scraper									KT002030N001	

Elcometer 2070 NPIRI Fineness of Grind Gauge

Precision instruments used to determine particle size and fineness of grind of many materials, but specifically printing inks.

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

The NPIRI scale is displayed alongside the microns scale.

Model	Range		Specifications							Part Number	
	µm	mils	Number of Grooves	Groove Width		Groove Length		Graduation		Metric	Imperial
				mm	inches	mm	inches	Metric	Imperial		
Elcometer 2070/1	0-25	0-1	2	25	0.98	165	6.5	2.5µm or 1 NPIRI	0.1 mil or 1 NPIRI	K0002070M001	K0US2070M001
Accessories	Replacement Scraper for NPIRI grooves									KT002070N001	

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Elcometer 2080 Meier Gauge

Special gauge made of hardened stainless steel to test drying, shrinkage or cracking of coatings or similar products, with a sloping groove 60mm wide and 200mm long, and 1, 2 or 3mm maximum depth.

The products are applied to the whole area of the groove.
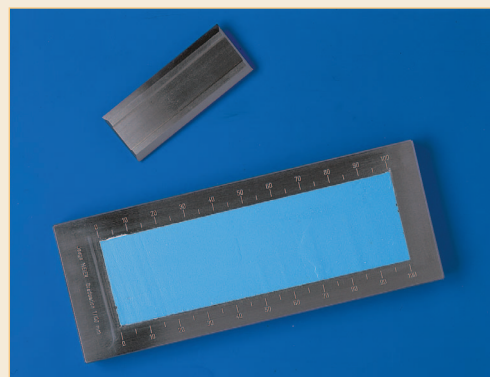
Model	Range		Number of Grooves	Groove Width		Groove Length		Graduation	Part Number	
	µm	mils		mm	inches	mm	inches	mm	Metric	Imperial
Elcometer 2080/1	0-1000	0-40	1	60	2.36	200	7.87	0.05	K0002080M001	K0US2080M001
Elcometer 2080/2	0-2000	0-80	1	60	2.36	200	7.87	0.10	K0002080M002	K0US2080M002
Elcometer 2080/3	0-3000	-	1	60	2.36	200	7.87	0.15	K0002080M003	-
Accessories	Replacement Scraper								KT002070N001	

Elcometer 2060 ISO Groove Depth Checker

The accuracy of fineness gauges may be impaired after a certain time of use. The ISO standard recommends the depth is checked.

A digital comparator with a tapering point is fitted onto a rule with a central V-shaped opening and a contact edge bevelled to an angle of 60°, with thermal insulation on its upper surfaces.

The instrument is reset to zero beforehand on a reference surface, positioned perpendicular to the groove and provides an accurate measurement of the depth of the groove at the place being checked.

Readings in microns.

Can be used in accordance with:	
DIN EN ISO NF 21524	ISO 1524

Model	Description	Part Number
Elcometer 2060	ISO Groove Depth Checker for Fineness of Grind Gauges with Calibration Certificate	K0002060M001
Accessories	Computer Connection Cable	KT002060P004

Viscosity

The extent to which a liquid resists a tendency to flow is defined as viscosity. In the coatings industry, this behaviour is one of the key parameters.

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

Flow Cups: The process of flow through an orifice can often be used as a relative measurement and classification of viscosity. This measured kinematic viscosity is generally expressed in seconds of flow time which can be converted into Centistokes using a viscosity disc calculator.

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

Rotational: Rotational viscometers are used to determine the viscosity of liquids which do not depend solely on temperature and pressure. The behaviour of non-Newtonian liquids can be determined using a range of rotational viscometers in particular the Cone and Plate viscometers (see pages 14-17).

Flow & Dip Cups

	Viscosity Cup Reference Table[1]						
Cup Type	Range (cSt)		Time (seconds)		Advised Standard Oil	Kinematic** Viscosity (cSt)	Drain Time** (seconds)
	Minimum	Maximum	Minimum	Maximum			
DIN 4	96	683	25	150	S200	460	101.5
ISO 3	7	42	30	100	S20	34	82.5
ISO 4	34	135	30	100	N35	66	47
ISO 5	91	326	30	100	N100	230	71
ISO 6	188	684	30	100	S200	460	68
ASTM 1	10	35	55.5	106.5	N10 or C10*	17	69.5
ASTM 2	25	120	35.5	87.5	S20 or C20*	34	41.5
ASTM 3	49	220	28	102	S60 or C60*	120	58.5
ASTM 4	70	370	23	101	S60 or C60*	120	35.5
ASTM 5	200	1200	18.5	101	S200 or C200*	460	40
ZAHN 1	5	56	33.5	80	N10 or C10*	17	44.5
ZAHN 2	21	231	20	80	S60 or C60*	120	48
ZAHN 3	146	848	20	80	S200 or C200*	460	47
ZAHN 4	222	1110	20	80	S200 or C200*	460	36
ZAHN 5	460	1840	20	80	N350 or C350*	850	36.5
AFNOR 2.5	5Cps	140Cps	30	250	S60	120	***
AFNOR 4	50Cps	1100Cps	20	300	S200	460	***
AFNOR 6	510Cps	5100Cps	30	300	S600	1600	***

* The 'S' and 'N' prefix you have dynamic viscosity, kinematic viscosity and density at different temperatures; with the 'C' prefix, kinematic viscosity and drain time is at 25ºC (77ºF) for Zahn, Ford and Shell Cups.

** Kinematic viscosity and drain times mentioned above are approximate values at 25ºC (77ºF). Exact values will be displayed on the standard oil bottle.

*** For comparison only.

[1] For information purposes only.

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Elcometer 2400 Viscosity Disc

A conversion table that allows the viscosity (in cSt) and flow times of different cups to be compared.

Front: No. 4 Cups according to BS, NF, ASTM, DIN and Zahn 2.

Back: No. 3-4-5-6 Cups according to ISO and Zahn 3, as well as Gardner Bubble Viscometers.

Model	Description	Part Number
Elcometer 2400	Elcometer 2400 Viscosity Conversion Disc	KT002400N003

Elcometer 7300 Digital Stopwatch

A professional high precision, Digital LCD pocket sized stopwatch for measuring flow time.

Features include:

- Time/calendar display: hour, minute, second, month, day, date.
- Stopwatch: $1/100$ second for 30 minutes, 1 second up to 24 hours.
- 12/24 hour display mode.

Model	Description	Part Number
Elcometer 7300	Digital Stopwatch	K0007300M201
Accessories	Replacement Battery (LR44)	T9991359-

How to use a Viscosity Cup

Once the viscosity cup is truely horizontal (this is best achieved using a cup stand and bubble level), cover the exit orifice and fill the cup making sure that the meniscus of the liquid is above the rim of the cup.

Using the glass draw plate, remove the meniscus into the overflow ring and close the cup.

Open the exit orifice and remove the glass draw plate. Time between the removal of the glass draw plate and the first break in the liquid's flow is measured.
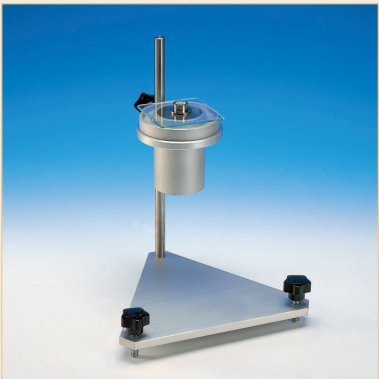
Elcometer Viscosity Cups (AFNOR, BS, DIN, FORD, ISO)

Very easy to use instruments 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 in centistokes (cSt) and, a calibration certificate is available upon request.

The cups can be supplied separately or with an adjustable stand which includes a precision level and an overflow glass draw plate. The stand can also be supplied with a flow jacket for temperature control (thermo jacket).

Several ranges are available, according to standards; from 5 to 5100cSt.

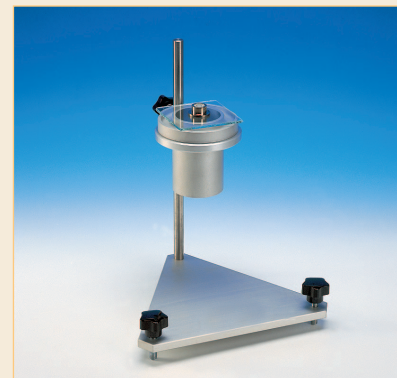| Model	Cup Number	Viscosity Cup Type		Range Centistokes (cSt)[1]	Part Number
Elcometer 2350/1	2	DIN	DIN 53211	-	K0002350M001
Elcometer 2350/2	4	DIN		96-683	K0002350M002
Elcometer 2350/3	6	DIN		-	K0002350M003
Elcometer 2350/4	8	DIN		-	K0002350M004
Elcometer 2351/1	1	FORD ASTM	FORD ASTM D1200	10-35	K0002351M001
Elcometer 2351/2	2	FORD ASTM		25-120	K0002351M002
Elcometer 2351/3	3	FORD ASTM		49-220	K0002351M003
Elcometer 2351/4	4	FORD ASTM		70-370	K0002351M004
Elcometer 2351/5	5	FORD ASTM		200-1200	K0002351M005
Elcometer 2352/1	2.5	AFNOR NFT	AFNOR NFT 30-014	5-140	K0002352M001
Elcometer 2352/2	4	AFNOR NFT		50-1100	K0002352M002
Elcometer 2352/3	6	AFNOR NFT		510-5100	K0002352M003
Elcometer 2353/1	3	ISO DIN NF NBN ASTM	ISO 2431 DIN 53224 NF T 30 070 NF EN 535 ASTM D1525 NBN T22-108	7-42	K0002353M001`
Elcometer 2353/2	4	ISO DIN NF NBN ASTM		34-135	K0002353M002
Elcometer 2353/3	5	ISO DIN NF NBN ASTM		91-326	K0002353M003
Elcometer 2353/4	6	ISO DIN NF NBN ASTM		188-684	K0002353M004
Elcometer 2353/5	8	ISO DIN NF NBN ASTM		-	K0002353M005
Elcometer 2354/1	2	BS	BS 3900 A6	-	K0002354M001
Elcometer 2354/2	3	BS		-	K0002354M002
Elcometer 2354/3	4	BS		-	K0002354M003
Elcometer 2354/4	5	BS		-	K0002354M004
Elcometer 2354/5	6	BS		-	K0002354M005
Accessories	Stand with Bubble Level for Cup and Glass Draw Plate				KT002400N001
	Double-walled Stand with Thermojacket (but without thermobath)				KT002400N002
	2400 Viscosity Conversion Disc (see page 6)				KT002400N003
	Bubble Level for Viscosity Cup				KT002400P001
	Viscosity Glass Draw Plate				KT002400P999
	Stopwatches				(see page 6)
	Viscosity Standard Oils for Calibration				(see page 10)

Elcometer provides a viscosity recalibration service using state of the art climate controlled facilities, for information please contact Elcometer.

[1] For information

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Elcometer FRIKMAR Viscosity Cups with Handle

Thanks to its handle, this cup is very easy to use and performs quick controls in the workshop or during the manufacturing process. Ideal for measuring the consistency of paints, varnishes and similar products.

The cup is first dipped into the product to be measured, then empties through the orifice. The measured kinematic viscosity is generally expressed in seconds (s) flow time, which can be converted to Centistokes (cSt), if standard stipulates conversion method.

Several ranges are available, according to standards; from 7 to 1100cSt.

Model	Cup Number	Viscosity Cup Type		Range Centistokes (cSt)[1]	Part Number
Elcometer 2434/1	2	DIN		-	K0002434M001
Elcometer 2434/2	4	DIN	DIN 53211	96-683	K0002434M002
Elcometer 2434/3	6	DIN		-	K0002434M003
Elcometer 2434/4	8	DIN		-	K0002434M004
Elcometer 2435/1	4	ASTM	ASTM D1200	70-370	K0002435M001
Elcometer 2436/1	4	AFNOR NTT	AFNOR NTT 30-014	50-1100	K0002436M001
Elcometer 2437/1	2	ISO DIN NF NBN ASTM		-	K0002437M001
Elcometer 2437/2	3	ISO DIN NF NBN ASTM	ISO 2431	7-42	K0002437M002
Elcometer 2437/3	4	ISO DIN NF NBN ASTM	DIN 53224	34-135	K0002437M003
Elcometer 2437/6	5	ISO DIN NF NBN ASTM	NF T 30 070 NF EN 535	91-326	K0002437M006
Elcometer 2437/4	6	ISO DIN NF NBN ASTM	ASTM D1525	188-684	K0002437M004
Elcometer 2437/5	8	ISO DIN NF NBN ASTM	NBN T22-108	-	K0002437M005
Accessories	2400 Viscosity Conversion Disc (see page 6)				KT002400N003
	Stopwatches				(see page 6)
	Viscosity Standard Oils for Calibration				(see page 10)

Elcometer provides a viscosity recalibration service using state of the art, climate controlled facilities, for information please contact Elcometer.

Elcometer 2210 Zahn Viscosity Cups

Easy-to-use stainless steel apparatus, for quick viscosity measurement of products on site or during production. The cup is first dipped into the product to be measured, then empties through the orifice.

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

Five different orifices for measurements between 5 and 1840cSt are available.

Model	Cup Number	Range Centistokes (cSt)[1]	Part Number
Elcometer 2210/1	1	5-56	K0002210M001
Elcometer 2210/2	2	21-231	K0002210M002
Elcometer 2210/3	3	146-848	K0002210M003
Elcometer 2210/4	4	222-1110	K0002210M004
Elcometer 2210/5	5	460-1840	K0002210M005
Accessories	2400 Viscosity Conversion Disc (see page 6)		KT002400N003
	Stopwatches		(see page 6)
	Viscosity Standard Oils for Calibration		(see page 10)

Elcometer provides a viscosity recalibration service using state of the art, climate controlled facilities, for information please contact Elcometer.

Can be used in accordance with:

ASTM D1084	ASTM D4212
ASTM D3794	

[1] for information only

Elcometer 2310 Shell Viscosity Cups

A stainless steel cup for quick measurements on-site or during production. This cup is often used in the printing or ink industry. The cup is first dipped into the product to be measured, then empties through the orifice.

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

Six different ranges are available for measurements between 2 and 1300cSt are available.

Can be used in accordance with:
ASTM D4212

Model	Cup Number	Range Centistokes (cSt)[1]	Part Number
Elcometer 2310/1	1	2-20	K0002310M001
Elcometer 2310/2	2	10-50	K0002310M002
Elcometer 2310/3	3	30-120	K0002310M003
Elcometer 2310/4	4	70-270	K0002310M004
Elcometer 2310/5	5	125-520	K0002310M005
Elcometer 2310/6	6	320-1300	K0002310M006
Accessories	2400 Viscosity Conversion Disc (see page 6)		KT002400N003
	Stopwatches		(see page 6)
	Viscosity Standard Oils for Calibration		(see page 10)

Elcometer provides a viscosity recalibration service using state of the art, climate controlled facilities, for information please contact Elcometer.

Elcometer 2215 Lory LCH Cup

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, then emptied. The flow time elapses when the point of the needle appears.

Model	Cup Number	Range Centistokes (cSt)[1]	Part Number
Elcometer 2215/1	1	50-1100	K0002215M001
Accessories	Stopwatches		(see page 6)

Elcometer provides a viscosity recalibration service using state of the art, climate controlled facilities, for information please contact Elcometer.

[1] for information only

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Elcometer 2410 Viscosity Standard Oils for Calibration

In order to check your viscosity cup's calibration or to certify it for ISO purposes, it is imperative that you use viscosity standards.

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

To check the viscosity cup, simply use the standard viscosity oils in place of your liquid and measure the drain time.
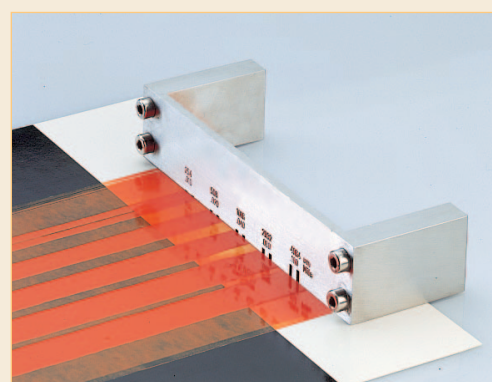
Model	Description	Part Number
Elcometer 2410/1	Standard Viscosity Oil S20	K0002410M001
Elcometer 2410/2	Standard Viscosity Oil S60	K0002410M002
Elcometer 2410/3	Standard Viscosity Oil S200	K0002410M003
Elcometer 2410/4	Standard Viscosity Oil S600	K0002410M004
Elcometer 2410/11	Standard Viscosity Oil N10	K0002410M011
Elcometer 2410/12	Standard Viscosity Oil N100	K0002410M012
Elcometer 2410/13	Standard Viscosity Oil N350	K0002410M013
Elcometer 2410/21	Standard Viscosity Oil C20	K0002410M021
Elcometer 2410/22	Standard Viscosity Oil C60	K0002410M022
Elcometer 2410/23	Standard Viscosity Oil C100	K0002410M023
Elcometer 2410/24	Standard Viscosity Oil C200	K0002410M024
Elcometer 2410/25	Standard Viscosity Oil C350	K0002410M025
Elcometer 2410/26	Standard Viscosity Oil C600	K0002410M026

Elcometer provides a viscosity recalibration service using state of the art, climate controlled facilities, for information please contact Elcometer.

Elcometer 4260 NYPC Levelling Tester

Made of stainless steel with straight scraper fitted with 5 pairs of notches of increasing depth from 25µm to 4.06mm (1 to 160mils), the Elcometer 4260 NYPC Levelling Tester is used to determine a coating's ability to level before curing.

Once the drawdown has been made on a horizontal, firm surface, leave the coating to cure. Once the coating is dry, identify the thickness at which the pair of film stripes merge.

Can be used in accordance with:
ASTM D 2801

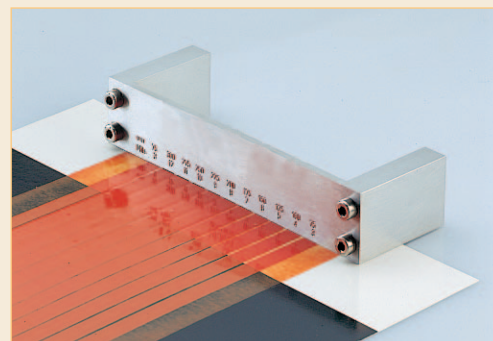| Model	Description	Part Number	
		Metric	Imperial
Elcometer 4260/1	Elcometer 4260 NYPC Levelling Tester	K0004260M201	K0US4260M201
Accessories	Test Charts	(see pages 33-38)	

Elcometer 4270 Sag Tester

Made of stainless steel, the straight scraper has 10 adjacent notches of increasing clearance. The Elcometer 4270 Sag Tester is used to establish the coatings resistance to sag due to gravity.

After the product has been spread, the contrast chart is immediately placed in a vertical position with the thinnest film at the top. The thickness at which the stripes join indicates the tendency to sag.

Can be used in accordance with:
FMTS 141A Method 4494

Model	Description	Range		Part Number	
		µm	mils	Metric	Imperial
Elcometer 4270/1	4270 Sag Tester	75-300	3-12	K0004270M001	K0US4270M001
Elcometer 4270/2	4270 Sag Tester	25-150	1-6	K0004270M002	K0US4270M002
Elcometer 4270/3	4270 Sag Tester	350-1500	14-60	K0004270M203	K0US4270M203
Elcometer 4270/4	4270 Sag Tester	100-600	4-24	K0004270M204	K0US4270M204
Accessories	Test Charts			(see pages 33-38)	

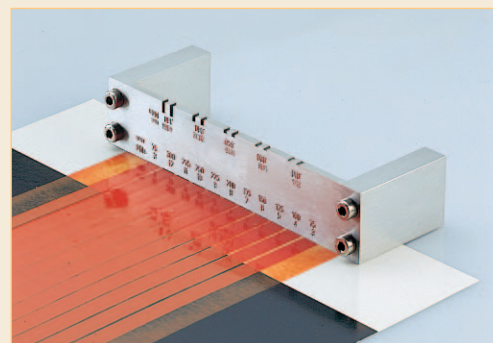# Elcometer 4280 NYPC Levelling & Sag Tester

The Elcometer 4280 combines the Elcometer 4260 NYPC Levelling Test with the Sag Test of the Elcometer 4270.

This dual gauge is used to assess a coating's levelling characteristics and its resistance to sag due to gravity.

Can be used in accordance with:	
ASTM D 2801	FMTS 141A Method 4494

Model	Description	Range		Part Number	
		µm	mils	Metric	Imperial
Elcometer 4280	Elcometer 4280 NYPC Levelling and Sag Tester	75-300	3-12	K0004280M001	K0US4280M001
Accessories	Test Charts			(see pages 33-38)	

Elcometer 4290 Sag Quadruplex Film Applicator

This stainless steel film applicator has 4 spreading edges in the form of a straight scraper each with 4, 6 or 10 adjacent notches (depending on the model) of variable depth. Simultaneously applying several stripes of film of increasing thickness.

Ideal for the determination of opacity or hiding power.

Can be used in accordance with:	
ASTM D 2801	FMTS 141A Method 4494
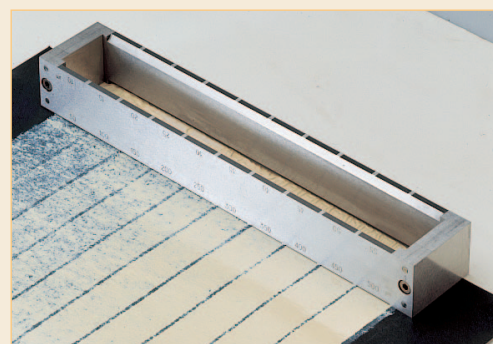
Model	Description	Number of Apertures	Apertures Between		Part Number	
			µm	mils	Metric	Imperial
Elcometer 4290/1	4290 Sag Quadruplex Applicator	16	25-450	1-18	K0004290M001	K0US4290M001
Elcometer 4290/3	4290 Sag Quadruplex Applicator	24	10-400	0.4-16	K0004290M003	K0US4290M003
Elcometer 4290/2	4290 Sag Quadruplex Applicator	40	10-500	0.4-20	K0004290M002	K0US4290M002
Accessories	Test Charts – *for our complete range*				(see pages 33-38)	

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Elcometer 2280 Matthis Fluidometer

A simple and easy-to-use instrument to measure the fluidity of a coating.

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

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

Model	Description	Part Number
Elcometer 2280/1	Matthis Fluidometer	K0002280M001

Elcometer 2290 Daniel Flow Gauge

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

The product is poured into the semi-cylindrical reservoir. When the instrument is lifted vertically, the product runs on a graduated plate, which is fixed perpendicular to the reservoir. The distance covered in a given time is the measure of the fluidity.

Model	Description	Part Number
Elcometer 2290/1	Daniel Flow Gauge	K0002290M001

Elcometer 8510 Surface Tension Checkers

Surface tension fluids give an accurate measurement of graduated surface tension levels. The fluid is applied to the surface or substrate until a satisfactory dyne level is found.

Spread the test fluid from the felt tip pen lightly over an approximate area of $7cm^2$ (1 sq in) of the test specimen, noting the time it takes for the continuous film of ink to break into droplets.

Experience has shown that wetting is normally adequate when a continuous film of test fluid remains intact for 2 seconds. Breaking the fluid into droplets in less than 2 seconds indicates a lack of wetting and a lower numbered test fluid should be tried.

If the fluid remains in tact for more than 2 seconds, a higher number test fluid should be tried. The aim is to establish the lowest reading at an optimum dwell time of 2 seconds.

Can be used in accordance with:	
ASTM D 2578-67	DIN 53 364

Model	Description	Fluid Tension Value dynes/cm (mN/m)	Part Number
Elcometer 8510/1	Surface Tension Checkers - 6 x 100ml (3.3fl.oz.) bottles	when ordering please order the 6 fluid tension values you require in the kit from the list below	K0008510M001

Tension Value dynes/cm (mN/m)	Part Number	Tension Value dynes/cm (mN/m)	Part Number	Tension Value dynes/cm (mN/m)	Part Number	Tension Value dynes/cm (mN/m)	Part Number
31	K0008510P031	40	K0008510P040	49	K0008510P049	58	K0008510P058
32	K0008510P032	41	K0008510P041	50	K0008510P050	59	K0008510P059
33	K0008510P033	42	K0008510P042	51	K0008510P051	61	K0008510P061
34	K0008510P034	43	K0008510P043	52	K0008510P052	63	K0008510P063
35	K0008510P035	44	K0008510P044	53	K0008510P053	65	K0008510P065
36	K0008510P036	45	K0008510P045	54	K0008510P054	67	K0008510P067
37	K0008510P037	46	K0008510P046	55	K0008510P055	69	K0008510P069
38	K0008510P038	47	K0008510P047	56	K0008510P056	71	K0008510P071
39	K0008510P039	48	K0008510P048	57	K0008510P057		

Rotational Viscosity

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

Thixotropic – Describes materials that are gel-like at rest but liquid when agitated.

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

Newtonian Liquids – The viscosity of a Newtonian liquid is dependent only on temperature, not on shear rate and time.

Non-Newtonian liquids - time dependent. The viscosity of the liquid is dependent on temperature, shear rate and time.

Depending on how viscosity changes with time the flow behaviour is characterised as:
- Thixotropic (time thinning, i.e. viscosity decreases with time).
- Rheopetic (time thickening, i.e. viscosity increases with time).

Thixotropic liquids are quite common in the chemical and food industries. Rheopectic liquids are very rare. Note: some liquids show time thinning behaviour due to breakdown of structure. This phenomenon is sometimes known as Rheomaiaxis.

Non-Newtonian liquids - time independent. The viscosity of a Non-Newtonian time independent liquid is dependent not only on temperature but also on shear rate.

Depending on how viscosity changes with shear rate, the flow behaviour is characterised as:
- shear thinning – also known as Pseudoplastics - the viscosity decreases with increased shear rate.
- shear thickening – also known as Dilatant - the viscosity increases with increased shear rate.
- plastic - exhibits a so-called yield value, i.e. a certain shear stress must be applied before flow occurs.

Elcometer 2200 Digital Viscometer

This simple to use rotational viscometer consists of a spindle and paddle. The spindle is rotated at 200rpm and, when the paddle is immersed in the sample coating, the Elcometer 2200 automatically calculates the viscosity value from the power required to maintain the spindle at 200rpm.
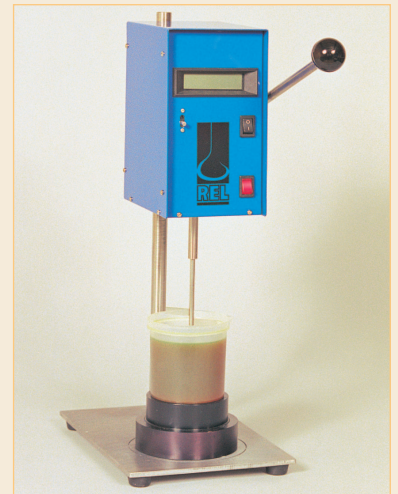
A Choice of Three Viscosity Ranges.

A digital display, at a flick of a switch, shows the reading selected in either:

- Centipoises
- Krebs Units
- Grams

The Elcometer 2200 can also be fitted with an air purge for use in a hazardous environment.

Can be used in accordance with:	
ASTM D 562	ASTM D 856
ASTM D 1131	FTMS 141 M 4281

Range	Centipoise:	150 to 4000cP	Krebs Units:	40 to 140KU	KU Weight:	35 to 1150g
Resolution	Centipoise:	1.0cP	Krebs Units:	0.1KU	Weight:	1.0g
Accuracy	± 1.0% of full scale					
Spindle Rotation Speed	200rpm ±0.2rpm					

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 2200/1	Elcometer 2200 Digital Viscometer	K0UK2200M202	K0002200M202	K0US2200M202
Elcometer 2200/2	Elcometer 2200 Digital Viscometer with air purge	K0UK2200M203	K0002200M203	K0US2200M203

Elcometer 2205 Analogue Cone & Plate Viscometer

The Elcometer 2205 Cone and Plate Viscometer has been designed specifically to provide high shear rate tests for coatings.

Running at a single speed of 900rpm (60Hz) or 750rpm (50Hz), the Elcometer 2205 Analogue Cone and Plate Viscometer comes in two model variations:

Low Temperature Models - Choose from either a range of single pre-set temperature models or a single model with three pre-set temperatures.

High Temperature Models - Supplied in 3 temperature ranges with 6 pre-set temperatures.

The low temperature Viscometer: Designed to facilitate routine measurement of the viscosity of paints. Good correlation with application methods (e.g. brushing) is ensured by the use of a high rate of shear (10,000 sec^{-1}). The cone and plate principle is selected because this is one of the most convenient ways of obtaining high rates of shear.
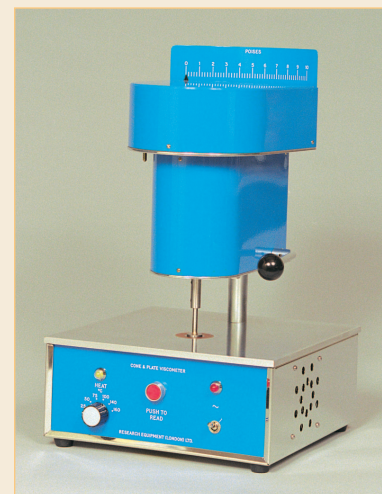
The ranges of measurement of 0-2, 0-5poise and 0-10poise are chosen as suitable for most normal paints. Alternative rates of shear or ranges of measurement can be obtained by using cones of alternative size or angle – see page 17 for the range of cone types available.

Temperature control is essential in measuring the viscosity of paint. This Viscometer has a built-in provision for holding the sample at the temperature regardless of normal variations in the bulk sample or in room temperature. Heating or cooling of the sample is by a Peltier effect semi-conductor device. The sample reaches the control temperature in no more than 15 seconds.

The high temperature Viscometer: Designed for the control of the viscosity of resins, bitumen, hot melts and similar products, during manufacture.

These Viscometers enable a very small sample from the cooking vessel to be checked for viscosity in less than a minute. The instrument is thermostatically controlled over a wide range of temperatures, one of which is selected so that the melt viscosity of the resin comes within the viscosity range of the instrument. In this way, thinning tests are eliminated and a quick and accurate determination of resin viscosity is obtained.

Ease of cleaning is ensured by the small sample required and the ease of access made possible by the simple geometry of the cone and plate principle. A wipe with paper tissue and suitable solvent is all that is normally required.

Can be used in accordance with:

BS3900 A7	ASTM D 2196

Standard Viscosity Range	0-2poise at 10,000sec^{-1} 0-2.5poise at 10,000sec^{-1} 0-5poise at 10,000sec^{-1}	0-10poise at 10,000sec^{-1} 0-20poise at 2,500sec^{-1} 0-40poise at 2,500sec^{-1} 0-100poise at 2,500sec^{-1}
Cone Type	To suit range: 0-2, 0-5, 0-10, 0-20, 0-40, 0-100poise	
Accuracy	±2% of full scale, confirmed using oils traceable to National Standards	
Temperature control of sample	One or three switched temperatures in the range 10-75ºC, (50-167ºF) Six temperatures in the range 25-230ºC, (77-446ºF)	
Variable temperature resolution	±0.1ºC (±0.2ºF)	

Model	Description	Temperature		Part Number		
		Type	Range	UK 240V	EUR 220V	US 110V
Elcometer 2205/1	Analogue Cone & Plate Viscometer	1	20ºC (68ºF)	K0UK2205M001	K0002205M001	K0US2205M001
Elcometer 2205/2	Analogue Cone & Plate Viscometer	1	23ºC (73.4ºF)	K0UK2205M002	K0002205M002	K0US2205M002
Elcometer 2205/3	Analogue Cone & Plate Viscometer	1	25ºC (77ºF)	K0UK2205M003	K0002205M003	K0US2205M003
Elcometer 2205/4	Analogue Cone & Plate Viscometer	1	30ºC (86ºF)	K0UK2205M004	K0002205M004	K0US2205M004
Elcometer 2205/10	Analogue Cone & Plate Viscometer	3	10-75ºC (50-167ºF)	K0UK2205M010	K0002205M010	K0US2205M010
Elcometer 2205/21	Analogue Cone & Plate Viscometer	6	25-150ºC (77-302ºF)	K0UK2205M021	K0002205M021	K0US2205M021
Elcometer 2205/22	Analogue Cone & Plate Viscometer	6	25-200ºC (77-392ºF)	K0UK2205M022	K0002205M022	K0US2205M022
Elcometer 2205/23	Analogue Cone & Plate Viscometer	6	25-230ºC (77-446ºF)	K0UK2205M023	K0002205M023	K0US2205M023

Please select the cone type required for your coatings application from the Cone List on page 17.

Elcometer 2206 Digital Cone & Plate Viscometer

The Elcometer 2206 is a Cone and Plate Viscometer designed for quick results, required by Process Control and Quality Departments when monitoring production. Although manufactured in a rugged design needed for manufacturing, the Elcometer 2206 has a range of features to meet the ever demanding controls on modern production standards.

A range of low and high temperature models are available to meet your exact requirement. Choose either a single temperature, 3 or 6 pre-set temperatures or set your own temperature using our variable temperature model.

Used in the paint, varnish, inks, resins, food, bitumen, oil, adhesives and pharmaceutical industries.

The low temperature Viscometer: Designed to facilitate routine measurement of the viscosity of paints. Good correlation with application methods (e.g. brushing) is ensured by the use of a high rate of shear (10,000 sec^{-1}). The cone and plate principle is selected because this is one of the most convenient ways of obtaining high rates of shear.

The ranges of measurement of 0-2, 0-5poise and 0-10poise are chosen as suitable for most normal paints. Alternative rates of shear or ranges of measurement can be obtained by using cones of alternative size or angle.

Temperature control is essential in measuring the viscosity of paint. This Viscometer has built-in provision for holding the sample at the temperature regardless of normal variations in the bulk sample or in room temperature. Heating or cooling of the sample is by a Peltier effect semi-conductor device. The sample reaches the control temperature in no more than 15 seconds.

The high temperature Viscometer: Designed for the control of the viscosity of resins, bitumen, hot melts and similar products, during manufacture.

These Viscometers enable a very small sample from the cooking vessel to be checked for viscosity in less than a minute. The instrument is thermostatically controlled over a wide range of temperatures, one of which is selected so that the melt viscosity of the resin comes within the viscosity range of the instrument.

In this way, thinning tests are eliminated and a quick and accurate determination of resin viscosity is obtained.

Ease of cleaning is ensured by the small sample required and the ease of access made possible by the simple geometry of the cone and plate principle. A wipe with paper tissue and suitable solvent is all that is normally required.

Can be used in accordance with:	
ASTM D 4287	BS3900 A7
ISO 2884	

Standard Viscosity Range	0-2poise at 10,000sec^{-1} 0-2.5poise at 10,000sec^{-1} 0-5poise at 10,000sec^{-1}	0-10poise at 10,000sec^{-1} 0-20poise at 2,500sec^{-1} 0-40poise at 2,500sec^{-1} 0-100poise at 2,500sec^{-1}
Cone Type	To suit range: 0-2, 0-5, 0-10, 0-20, 0-40, 0-100poise	
Accuracy	±2% of full scale, confirmed using oils traceable to National Standards.	
Temperature control of sample	One or three switched temperatures in the range 10-75°C, (50-167°F) Six temperatures in the range 25-230°C, (77-446°F) Variable Temperature Setting 10-75°C or 25-230°C (50-167°F or 77-446°F)	
Variable temperature resolution	±0.1°C (±0.2°F)	

Model	Description	Temperature		Part Number		
		Type	Range	UK 240V	EUR 220V	US 110V
Elcometer 2206/1	Digital Cone and Plate Viscometer	1	20°C (68°F)	K0UK2206M001	K0002206M001	K0US2206M001
Elcometer 2206/2	Digital Cone and Plate Viscometer	1	23°C (73.4°F)	K0UK2206M002	K0002206M002	K0US2206M002
Elcometer 2206/3	Digital Cone and Plate Viscometer	1	25°C (77°F)	K0UK2206M003	K0002206M003	K0US2206M003
Elcometer 2206/4	Digital Cone and Plate Viscometer	1	30°C (86°F)	K0UK2206M004	K0002206M004	K0US2206M004
Elcometer 2206/10	Digital Cone and Plate Viscometer	3	10-75°C (50-167°F)	K0UK2206M010	K0002206M010	K0US2206M010
Elcometer 2206/21	Digital Cone and Plate Viscometer	6	25-150°C (77-302°F)	K0UK2206M021	K0002206M021	K0US2206M021
Elcometer 2206/22	Digital Cone and Plate Viscometer	6	25-200°C (77-392°F)	K0UK2206M022	K0002206M022	K0US2206M022
Elcometer 2206/23	Digital Cone and Plate Viscometer	6	25-230°C (77-446°F)	K0UK2206M023	K0002206M023	K0US2206M023
Elcometer 2206/30	Digital Cone and Plate Viscometer	variable	10-75°C (50-167°F)	K0UK2206M030	K0002206M030	K0US2206M030
Elcometer 2206/31	Digital Cone and Plate Viscometer	variable	25-230°C (77-446°F)	K0UK2206M031	K0002206M031	K0US2206M031

Please select the cone type required for your coatings application from the Cone List on page 17.

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## Elcometer 2207 Multi-Speed Digital Cone & Plate Viscometer

The Elcometer 2207 Cone and Plate Viscometer allows the User to not only select the appropriate temperature range (between 10° and 230ºC, [50° – 446ºF]), but also take readings at variable shear rates using the Elcometer 2207's multiple speed control.

The User has the option of either a three speed model or an 8 speed model for even greater choice. See page 17 for a list of the range of viscosity values at each of the different speeds.

Select from a range of different temperature options – single temperature, 3 or 6 pre-set temperatures or user definable temperatures.

- Only a small sample is required – very easy to clean.
- The Elcometer 2207 provides an accurate result – in seconds.
- Wide temperature range – pre-set or user variable.
- Thermostatic control.
- Latched button.
- Auto – zero.
- Recalibration by a simple lever adjustment.
- Digital display indicates: Operating Range and Reading value in poise (P).
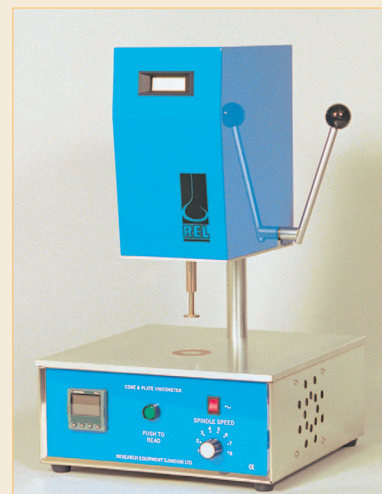
Full Scale Poise Ranges: 2, 5, 10, 20, 40, 100poise at 750rpm; 62.5, 125, 250, 500poise at 60rpm.

Can be used in accordance with:	
ASTM D 4287	BS3900 A7
ISO 2884	

Standard Viscosity Range	See Multi-Speed Range Table on page 17
Accuracy	±2% of full scale, confirmed using oils traceable to National Standards.
Temperature control of sample	One or three switched temperatures in the range 10-75ºC, (50-167ºF) Six temperatures in the range 25-230ºC, (77-446ºF) Variable Temperature Setting 10-75ºC or 25-230ºC, (50-167ºF or 77-446ºF)
Variable temperature resolution	±0.1ºC (±0.2ºF)
Cone Type	Please select the cone type required for your coatings application from the Cone List on page 17.

Model	Description	Temperature		Part Number		
		Type	Range	UK 240V	EUR 220V	US 110V
Elcometer 2207/1	Multi-Speed Cone & Plate	1 temp, 3 speeds	20ºC (68ºF)	K0UK2207M001	K0002207M001	K0US2207M001
Elcometer 2207/2	Multi-Speed Cone & Plate	1 temp, 3 speeds	23ºC (73.4ºF)	K0UK2207M002	K0002207M002	K0US2207M002
Elcometer 2207/3	Multi-Speed Cone & Plate	1 temp, 3 speeds	25ºC (77ºF)	K0UK2207M003	K0002207M003	K0US2207M003
Elcometer 2207/4	Multi-Speed Cone & Plate	1 temp, 3 speeds	30ºC (86ºF)	K0UK2207M004	K0002207M004	K0US2207M004
Elcometer 2207/10	Multi-Speed Cone & Plate	3 temp, 3 speeds	10-75ºC (50-167ºF)	K0UK2207M010	K0002207M010	K0US2207M010
Elcometer 2207/21	Multi-Speed Cone & Plate	6 temp, 3 speeds	25-150ºC (77-302ºF)	K0UK2207M021	K0002207M021	K0US2207M021
Elcometer 2207/22	Multi-Speed Cone & Plate	6 temp, 3 speeds	25-200ºC (77-392ºF)	K0UK2207M022	K0002207M022	K0US2207M022
Elcometer 2207/23	Multi-Speed Cone & Plate	6 temp, 3 speeds	25-230ºC (77-446ºF)	K0UK2207M023	K0002207M023	K0US2207M023
Elcometer 2207/30	Multi-Speed Cone & Plate	variable, 3 speeds	10-75ºC (50-167ºF)	K0UK2207M030	K0002207M030	K0US2207M030
Elcometer 2207/31	Multi-Speed Cone & Plate	variable, 3 speeds	25-230ºC (77-446ºF)	K0UK2207M031	K0002207M031	K0US2207M031
Elcometer 2207/41	Multi-Speed Cone & Plate	1 temp, 8 speeds	20ºC (68ºF)	K0UK2207M041	K0002207M041	K0US2207M041
Elcometer 2207/42	Multi-Speed Cone & Plate	1 temp, 8 speeds	23ºC (73.4ºF)	K0UK2207M042	K0002207M042	K0US2207M042
Elcometer 2207/43	Multi-Speed Cone & Plate	1 temp, 8 speeds	25ºC (77ºF)	K0UK2207M043	K0002207M043	K0US2207M043
Elcometer 2207/44	Multi-Speed Cone & Plate	1 temp, 8 speeds	30ºC (86ºF)	K0UK2207M044	K0002207M044	K0US2207M044
Elcometer 2207/50	Multi-Speed Cone & Plate	3 temp, 8 speeds	10-75ºC (50-167ºF)	K0UK2207M050	K0002207M050	K0US2207M050
Elcometer 2207/51	Multi-Speed Cone & Plate	6 temp, 8 speeds	25-150ºC (77-302ºF)	K0UK2207M051	K0002207M051	K0US2207M051
Elcometer 2207/52	Multi-Speed Cone & Plate	6 temp, 8 speeds	25-200ºC (77-392ºF)	K0UK2207M052	K0002207M052	K0US2207M052
Elcometer 2207/53	Multi-Speed Cone & Plate	6 temp, 8 speeds	25-230ºC (77-446ºF)	K0UK2207M053	K0002207M053	K0US2207M053
Elcometer 2207/60	Multi-Speed Cone & Plate	variable, 8 speeds	10-75ºC (50-167ºF)	K0UK2207M060	K0002207M060	K0US2207M060
Elcometer 2207/61	Multi-Speed Cone & Plate	variable, 8 speeds	25-230ºC (77-446ºF)	K0UK2207M061	K0002207M061	K0US2207M061

Please select the cone type required for your coatings application from the Cone List on page 17.

CONE TYPES FOR ALL ELCOMETER CONE AND PLATE VISCOMETERS

Cone Type	Standard Viscosity Range		Part Number
	Poise	Shear Rate	
2P	0-2 to 0-256poise	80-10,000 sec^{-1}	KT002205N001
5P	0-5 to 0-640poise	80-10,000sec^{-1}	KT002205N002
10P	0-10 to 0-1280poise	80-10,000sec^{-1}	KT002205N003
20P	0-20 to 0-2560poise	20-2,500sec^{-1}	KT002205N004
40P	0-40 to 0-5120poise	20-2,500sec^{-1}	KT002205N005
100P	0-100 to 0-12800poise	20-2,500sec^{-1}	KT002205N006

ELCOMETER 2207 MULTI-SPEED CONE AND PLATE VISCOMETER RANGE TABLE

Speed		Range (Poise, P)				
Setting	rpm	5P Cone	10P Cone	20P Cone	40P Cone	100P Cone
1	5.86	640	1280	2560	5120	12800
2	11.22	320	640	1280	2560	6400
3	23.44	160	320	640	1280	3200
4	46.90	80	160	320	640	1600
5	937.5	40	80	160	320	800
6	187.5	20	40	80	160	400
7	375	10	20	40	80	200
8	750	5	10	20	40	100

ELCOMETER 2207 MULTI-SPEED CONE AND PLATE VISCOMETER CONVERSION FACTORS; RANGE SET AT 10.0P

Multiply the reading obtained on the Elcometer 2207 by the relevant factor below to obtain the Poise Reading

Speed Setting	Shear Rate	Factor		Shear Rate	Factor		
		5P Cone	10P Cone		20P Cone	40P Cone	100P Cone
1	78	64	128	20	256	512	1280
2	156	32	64	39	128	256	640
3	313	16	32	78	64	128	320
4	625	8	16	156	32	64	160
5	1250	4	8	313	16	32	80
6	2500	2	4	625	8	16	40
7	5000	1	2	1250	4	8	20
8	10000	0.5	1	2500	2	4	10

Computer Software is also available – please contact Elcometer for further information.

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Density

The Density of a coating should remain constant from batch to batch. Also known as Density Cups or Specific Gravity Cups, Picnometers are used to determine the specific weight per unit volume of a liquid at a given temperature.

Elcometer 1800 Densimeter/Picnometer/Specific Gravity Cups

A stainless steel or anodised aluminium precision instrument for determining the specific weight of paints and similar products.

This instrument consists of a cylindrical container and cover with a hole for exhaust of excess liquid.

Three capacities are available: 50, 83 or 100cc. These can be supplied with or without a tare weight for weighing on a balance.

Can be used in accordance with:	
ASTM D 1475	DIN 53217
FTMS 141 a M4183	FTMS M4184/1
ISO 2811	NFT 30 020
NBN T 22-110	

Model	Description	Measurement		Part Number
		Capacity	Unit	
Elcometer 1800/1	Elcometer 1800 Picnometer - stainless steel	50cc	Metric	K0001800M001
Elcometer 1800/2	Elcometer 1800 Picnometer - stainless steel with test certificate	50cc	Metric	K0001800M002
Elcometer 1800/3	Elcometer 1800 Picnometer - aluminium	50cc	Metric	K0001800M003
Elcometer 1800/4	Elcometer 1800 Picnometer - aluminium with test certificate	50cc	Metric	K0001800M004
Elcometer 1800/5	Elcometer 1800 Picnometer - stainless steel	100cc	Metric	K0001800M005
Elcometer 1800/6	Elcometer 1800 Picnometer - stainless steel with test certificate	100cc	Metric	K0001800M006
Elcometer 1800/7	Elcometer 1800 Picnometer - aluminium	100cc	Metric	K0001800M007
Elcometer 1800/8	Elcometer 1800 Picnometer - aluminium with calibration certificate	100cc	Metric	K0001800M008
Elcometer 1800/1	Elcometer 1800 BS Specific Gravity Cup - stainless steel	50cc	Metric	K0US1800M001
Elcometer 1800/2	Elcometer 1800 BS Specific Gravity Cup - aluminium	50cc	Metric	K0US1800M002
Elcometer 1800/3	Elcometer 1800 BS Specific Gravity Cup - stainless steel	100cc	Metric	K0US1800M003
Elcometer 1800/4	Elcometer 1800 BS Specific Gravity Cup - aluminium	100cc	Metric	K0US1800M004
Elcometer 1800/5	Elcometer 1800 Imperial Specific Gravity Cup - stainless steel	83.2cc	Imperial	K0US1800M005
Elcometer 1800/6	Elcometer 1800 Imperial Specific Gravity Cup - aluminium	83.2cc	Imperial	K0US1800M006
Accessories	Tare-counterweight for Picnometer			KT001800N001
	Calibration Certificate			KCAL9960P047

Balances

Elcometer offers a range of laboratory scales for accurate measurements during the development of a coating. The Elcometer range of balances provides the user with a choice of standard, analytical or precision balances, with or without an enclosed cabinet.

Elcometer 8720 KB Balance

The Elcometer 8720 KB is a compact, low cost Balance which offers you extensive weighing functions.

Available in two ranges, the Elcometer 8720 KB is very easy to use and is supplied with a protective working cover and adjusting weight as standard.

Twenty user programmable metric and imperial weighing units.

Model	Description	Reproducibility	Linearity	Range	Part Number		
					UK 240V	EUR 220V	US 110V
Elcometer 8720/1	Standard Balance	0.01g	±0.03g	0-610g (0-21.5oz)	K0UK8720M001	K0008720M001	K0US8720M001
Elcometer 8720/2	Standard Balance	0.1g	±0.3g	0-6100g (0-215oz)	K0UK8720M002	K0008720M002	K0US8720M002

Elcometer 8721 Analytical Balance

The Elcometer 8721 Analytical Balance is a very stable and robust balance due to its metal casing.

Supplied with a glass draft enclosure for higher accuracy of measurements, the Elcometer 8721 allows the user to take repeatable measurements.

Each Balance is supplied with a test weight to allow the user to quickly adjust the calibration of the balance.

Model	Description	Reproducibility	Linearity	Range	Part Number		
					UK 240V	EUR 220V	US 110V
Elcometer 8721/1	Analytical Balance	0.001g	±0.002g	0-220g (0-7.76oz)	K0UK8721M001	K0008721M001	K0US8721M001

Elcometer 8722 Precision Balance

The Elcometer 8722 Precision Balance is an accurate, stable and robust balance which can be supplied with or without a plastic draft guard for higher accuracy of measurements.

The Elcometer Precision Balances are protected against spray and dust according to the IP54 standard.

With the cable accessory, the Elcometer 8722 can be connected to a computer for accurate recording of your data.

A range of User programmable metric and imperial measurement units can be displayed.

Model	Description	Reproducibility	Linearity	Range	Part Number		
					UK 240V	EUR 220V	US 110V
Elcometer 8722/1	Precision Balance	0.001g	±0.002g	0-420g (0-14.81oz)	K0UK8722M001	K0008722M001	K0US8722M001
Accessories	Draft Guard				KT008722P001		
	PC Cable				KT008722P002		

Dispersion & Coating Conductivity

In order to ensure that the materials in a coating are uniformly dispersed or mixed, it is necessary to blend the constituent elements.

Elcometer 7951 Minimix Paint Mixers

The Elcometer 7951 Paint Mixer is a very effective device for mixing and blending pigments and additives in a coating.

With a 5 litre (1.3 US Gallon) capacity and an overall dimension size of 55 x 58 x 75cm (21.6 x 22.8 x 29.5") the Elcometer 7951 has been designed to fit under most dispensing machines.

Easy to use, efficient, quiet and safe, the Elcometer 7951 has a range of features, which include:

- Visual display of time selected and countdown in seconds.
- 30, 45, and 90 second shaking cycles.
- Operation instructions displayed.
- Electronic diagnostics of the electrical system.
- Safety features to prevent incorrect use including:
  - Door lock delay keeps door locked until all movement has stopped.
  - Switches off if the can becomes loose.
  - Machine will not run if no can is present or if the can has not been properly clamped.
  - Override facility for shaking difficult plastic containers.
  - Enclosed cabinet for Improved Health and Safety.
- Can Dimensions:
  - Maximum can size diameter: 24cm (9.4"). • Maximum can height: 26cm (10.2"). • Maximum weight: 12kg (26.4lb).

Can be used in accordance with:	
BS7002; 1989	EN 60 950:1988

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 7951/1	Elcometer 7951 Paint Mixer – 5 litre (1.3 US Gallon)	K0UK7951M001	K0007951M001	K0US7951M001
Elcometer 7951/2	Elcometer 7951 Flameproof Paint Mixer - 5 litre (1.3 US Gallon)	K0UK7951M002	K0007951M002	K0US7951M002

Coating Conductivity

When coatings are applied using the electrostatic method, it is important to ensure that the specific resistance of the coating remains within the design specification. A low conductivity – or high resistance – must be maintained to ensure that the coating does not sag before curing.

Elcometer 7150 Conductivity Meter

An easy to use gauge for determining the specific resistance of paints and other liquids.
- Digital display.
- 2 integrated switchable reading scales:
  - 50kΩ - 2MΩ; resolution 1kΩ
  - 1MΩ - 20MΩ; resolution 10kΩ
- Measuring range of 0.05 to 20MΩ

Can be used in accordance with:
ASTM D 5682 Method B

Each unit is supplied with a removable and easy to clean stainless steel cylindrical electrode.

Model	Description	Part Number
Elcometer 7150	Elcometer 7150 Conductivity Meter	K0007150M002
Accessories	Probe for Elcometer 7150 Conductivity Meter	KT007150P002

Flash Point

When developing any solvent based liquids such as coatings or perfumes, it is imperative that you determine the flashpoint to meet the stringent regulations laid down by most governments around the world and declare it on the material safety data sheet.

Elcometer 6910 Setaflash 'Series 3' Closed Cup Tester

Combining the latest design standards with the highly successful Setaflash Tester, the new Setaflash Series 3 offers the fastest and most accurate flash point instrument at a cost effective price.

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

An extended operating temperature range allows tests from 0°C to 300°C (32°F to 572°F). Temperature is factory calibrated but facilities for user verification and calibration are incorporated. Flash point is automatically detected using a thermally activated detector, reducing the risk of operator error and minimising the potential danger of inhaling fumes during a test. A rechargeable gas tank with on/off switch and fine adjustment are integral to the unit. Supplied with a 2ml syringe and ignitor.

The Elcometer 6910 Setaflash Series 3 "Special", is also available which is the same as the 6910 Setaflash but is fitted with a cup suitable for testing corrosive samples.

Can be used in accordance with:	
ASTM D 13278	ASTM D 3828-IP303
BS3900 Part A13	EN456
ISO 3680	ISO 3679
UN Class 3 Non-viscous flammable liquids	

Elcometer 6910 Setaflash 'Series 3' Open Cup Tester

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 implications for the packaging storage and shipping of many materials.

Can be used in accordance with:	
ASTM D 13278	ASTM D 3828-IP303
BS3900 Part A13	EN456
ISO 3680	ISO 3679
NFT 30-068	
UN Class 3 Non-viscous flammable liquids	

Generally similar to the Elcometer 6910 Setaflash but with an open cup for flash/no flash finite determinations or sustained combustion tests. A manually operated flame sweeping arm is fitted to the cup and gas is supplied from the integral tank via the control valve. The flash or sustained combustion characteristics of the sample are observed visually by passing the test flame over the sample.

Voltage	115/220V (switchable)
Temperature Range	Ambient to 300°C (572°F)
Sample Size	2ml for flash points up to 100°C (212°F) 4ml for flash points between 100°C to 300°C (212°F to 572°F)
Test Time	1 to 99 minutes
Default Values	1 minute for flash points up to 100°C (212°F) 2 minutes for flash points between 100°C to 300°C (212°F to 572°F)
Cup Material	Aluminium
Dimensions	25.6 x 28 x 25.6cm (10.08 x 11.02 x 10.08")
Weight	4kg (8.8lb)

Model	Description	Part Number
Elcometer 6910/1	Elcometer 6910/1 Setaflash Series 3 Closed Cup Tester	K0006910M010
Elcometer 6910/2	Elcometer 6910/2 Setaflash Series 3 Open Cup Tester	K0006910M011

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Elcometer 7000/1 Setaflash 'Series 7'

An automated closed cup instrument which offers a small sample size and 1 or 2 minute standard test time, plus many automatic features which improve performance and ease of use.

Either Rapid Equilibrium or Ramp Mode may be selected; time, temperature and ramp values are digitally set, controlled and displayed. The user can choose pre-programmed values for standard test, set his own program values or override the program to perform a wide range of non-standard tests.

Shutter operation, flame dipping and flash detection are all automatic. The integral processor and printer provide a printout of flash point, automatically corrected for barometric pressure, together with a sample identification number. An RS232 interface is provided for connecting to the User's own data processing facilities.

The test cup has provision for water cooling to minimise the time between tests.

Supplied with 2ml syringe and a 0°C to 300°C (32°F to 572°F) secondary reference thermometer with certificate of calibration traceable to national standards.

Can be used in accordance with:	
ASTM D 3278	ASTM D 3828 - IP303
ASTM E 502	BS 3900 Part A13
BS 6664 Part 3	BS 6664 Part 4; EN 456
ISO DIN 3679	ISO 3680
UN Class 3 Non-viscous Flammable Liquids	

Elcometer 7000/2 Setaflash 'Series 7' Plus

An enhancement to the 7000/1 Setaflash Series 7 with the additional feature of electronic Peltier cells for rapid heating and cooling over its operating range of -30°C to 100°C (-22°F to 212°F).

This allows much greater flexibility, without the lengthy cool down experienced with other flash point testers. A supply of cooling water is required and to achieve -30°C (-22°F) the supply must be at least 0.6 litres/minute at 5°C (41°F) or lower.

Each instrument is supplied with a -30°C to 100°C (-22°F to 212°F) secondary reference thermometer.

Also available is the Elcometer 7000/3 Setaflash Series 7 Plus 'Special', which is the same as the 7000/1 Setaflash but is fitted with a cup suitable for testing corrosive samples.

	Elcometer 7000/1	Elcometer 7000/2 and Elcometer 7000/3
Temperature Range	Ambient to 300°C (572°F)	-30°C to 100°C (-22°F to 212°F)
Test Modes	Rapid Equilibrium and Ramp	
Test Duration, Ramp Mode	1 minute below 100°C (212°F), 2 minutes above 100°C (212°F), or user determined 1 to 99 minutes	1 minute standard or user selectable 1 to 99 minutes
Computer Interface	RS232C	
Voltage Range	110/120V and 220/240V, 50/60Hz (switchable)	
Power	200W (maximum)	
Size (HxWxD)	19 x 31 x 25cm (7.48 x 12.20 x 9.84")	21 x 49 x 30cm (8.27 x 19.29 x 11.81")
Weight	6.1kg (13.5lb)	11.2kg (24.7lb)

Model	Description	Part Number
Elcometer 7000/1	Elcometer 7000-1 Setaflash Series 7 Ambient to 300°C (572°F)	K0007000M001
Elcometer 7000/2	Elcometer 7000-2 Setaflash Series 7 Plus -30°C to 100°C (-22°F to 212°F)	K0007000M002
Elcometer 7000/3	Elcometer 7000-3 Setaflash Series 7 Plus Special	K0007000M003

Film Application & Test Charts

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

It is absolutely essential that any measurements made on such coatings, whether for the purpose of describing their appearance or their physical properties (colour, gloss, hiding power, drying time, 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 quality, high precision film applicators and motorised film applicators for greater repeatability and reproducibility when undertaking a large number of sample tests.

Elcometer also offer a wide range of Leneta Test Charts – the market standard – to meet all your specific requirements – see pages 33-38.

Elcometer 4300 Centrifugal Film Applicators - ICI Method

A device designed for specific applications, or when linear spreading techniques are unusable.

The product is poured in the centre of the test piece, fixed on a motorised turntable, and spread by centrifugal force. The thickness obtained depends on the nature of the product and on the speed of rotation.

Stable operation thanks to the sturdy anodised aluminium chassis.

Easy to clean, removable collecting pan and turntable.

Can be used in accordance with:
ASTM D 823 Method C

Elcometer 4300/1	11 pre-set speeds from 100 to 2000rpm, programmable duration from 0 to 999 seconds, with automatic stop when the cover is opened.
Elcometer 4300/2	Speeds variable from 150 to 2000rpm with digital display, programmable duration from 0 to 999 seconds, automatic stop if the cover is opened, braked stop upon completion. Supplied with an adjustable table for large samples.

Model	Description	Sample Size		Part Number		
		mm	inches	UK 240V	EUR 220V	US 110V
Elcometer 4300/1	Centrifugal Film Applicator	100 x 500	3.94 x 5.90	K0UK4300M001	K0004300M001	K0US4300M001
Elcometer 4300/2	Variable Speed Centrifugal Film Applicator	120 x 120 to 300 x 300	4.72 x 4.72 to 11.8 x 11.8	K0UK4300M002	K0004300M002	K0US4300M002
Accessories	Turntable with adjustable fixing of samples for the Elcometer 4300/1	50 x 50 to 153 x 153	1.96 x 1.96 to 6.02 x 6.02	KT04300P006		

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Elcometer 4310 Payne Method Dip Coater

A device designed for use with the Payne method to test the effectiveness of a coating applied by dipping. The Elcometer 4310 consists of a motor with a three-step pulley fitted on an adjustable tripod.

A cord suspends the test piece on one side and its counterweight on the other. It passes over a guide roller and winds onto one of the steps of the drive pulley, raising the test piece vertically after it has been dipped in the product.

The result depends on the viscosity of the product, the surface condition of the substrate and the speed at which the test piece is extracted.

Can be used in accordance with:

ASTM D 823 Method B

Model	Description	Speeds (mm)	Part Number		
			UK 240V	EUR 220V	US 110V
Elcometer 4310/1	3 Speed Payne Method Dip Coater	50, 75 or 100 per minute	K0UK4310M001	K0004310M001	K0US4310M001
Elcometer 4310/2	21 Speed Payne Method Dip Coater	From 50-1000 per minute	K0UK4310M002	K0004310M002	K0US4310M002

Elcometer 4330 Basic Motorised Film Applicator

A simplified lower-cost version of the Elcometer 4340 model range used to apply consistent and repeatable films.

The Elcometer 4330 is equipped with a system for fixing spiral bar coaters or other film applicators (see pages 26-32). Three buttons control the operation and direction of the fixing bar, and one button controls the speed.

Samples are secured with clamps over the supplied flexible non slip rubber mat.

Can be used with the Elcometer 4360 range of Spiral Bar Coaters – see page 26.
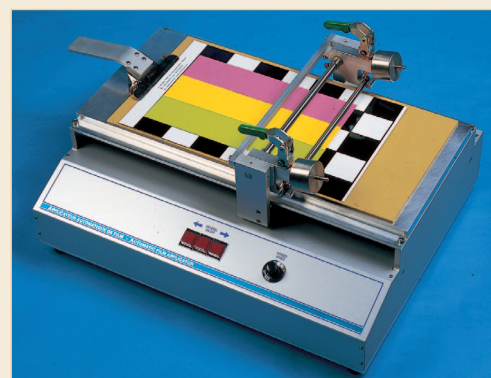
Can be used in accordance with:

ASTM D 823 Method C

Model	Description	Effective Dimensions		Part Number		
		cm	inches	UK 240V	EUR 220V	US 110V
Elcometer 4330/1	Basic Motorised Film Applicator	26 x 45	10.23 x 17.72	K0UK4330M001	K0004330M001	K0US4330M001
Accessories	Test Charts	(see pages 33-38 for a full range)				
	Spiral Bar Coaters	(see page 26 for a full range)				

Elcometer 4340 Motorised/Automatic Film Applicators

An essential machine for preparing a wide variety of product samples including: paint, varnish, cosmetics, glue, etc, with total consistency and reproducibility on various substrates including contrast charts, sheet steel, plastic foils and glass.
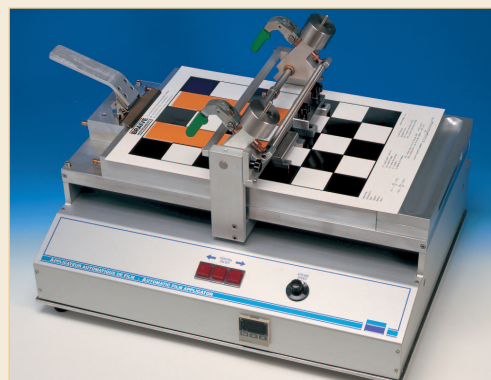
The Elcometer 4340 range is designed with 11 pre-set speeds and the test substrates are securely held in place by vacuum tables, which are either perforated or channelled.

The samples produced are of very high quality and completely comparable, which makes laboratory tests highly reliable.

Features include:

- 11 pre-set speeds - 0.5, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, and 10cm per second.
- A wide range of working tables - standard or high-precision vacuum tables, perforated or channelled, for optimally holding the medium in place.
- Drying time option and device with 5 or 10 spherical tipped tools.
- Sample temperature control option.
- Adjustable travel drive carriage with stop at end of travel.
- Can be used with the Elcometer Film Applicators.

Can be used in accordance with:
ASTM D 823 Method C

Elcometer have a wide range of different models available, which combine various vacuum table options – perforated, single and double channelled and temperature controlled tables – with a choice of application equipment items, including bar coaters device, drying time recorders and heated temperature tables.

Model	Product Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 4340/1	Motorised Applicator with Perforated Vacuum Table	K0UK4340M001	K0004340M001	K0US4340M001
Elcometer 4340/2	Motorised Applicator with Single Channel Vacuum Table	K0UK4340M002	K0004340M002	K0US4340M002
Elcometer 4340/3	Motorised Applicator with Double Channel Vacuum Table	K0UK4340M003	K0004340M003	K0US4340M003
Elcometer 4340/4	Motorised Applicator with Perforated Vacuum Table and Bar Coaters Fastening Device	K0UK4340M004	K0004340M004	K0US4340M004
Elcometer 4340/5	Motorised Applicator with Single Channel Vacuum Table and Bar Coaters Fastening Device	K0UK4340M005	K0004340M005	K0US4340M005
Elcometer 4340/6	Motorised Applicator with Double Channel Vacuum Table and Bar Coaters Fastening Device	K0UK4340M006	K0004340M006	K0US4340M006
Elcometer 4341/1	Motorised Applicator with Perforated Vacuum Table and 5 station drying time recorder	K0UK4341M001	K0004341M001	K0US4341M001
Elcometer 4341/2	Motorised Applicator with Single Channel Vacuum Table and 5 station drying time recorder	K0UK4341M002	K0004341M002	K0US4341M002
Elcometer 4342/1	Motorised Applicator with Perforated Vacuum Table and 10 station drying time recorder	K0UK4342M001	K0004342M001	K0US4342M001
Elcometer 4342/2	Motorised Applicator with Single Channel Vacuum Table and 10 station drying time recorder	K0UK4342M002	K0004342M002	K0US4342M002
Elcometer 4343/1	Motorised Applicator with Electromagnetic table for ferrous substrates	K0UK4343M001	K0004343M001	K0US4343M001
Elcometer 4344/1	Motorised Applicator with Perforated Vacuum Table and temperature bath controlled/heated vacuum table	K0UK4344M001	K0004344M001	K0US4344M001
Elcometer 4344/2	Motorised Applicator with Perforated Vacuum Table, 5 station drying time recorder and temperature bath controlled/heated vacuum table	K0UK4344M002	K0004344M002	K0US4344M002
Elcometer 4344/3	Motorised Applicator with Perforated Vacuum Table, 10 station drying time recorder and temperature bath controlled/heated vacuum table	K0UK4344M003	K0004344M003	K0US4344M003
Elcometer 4344/4	Motorised Applicator with Single Channel Vacuum Table and temperature bath controlled/heated vacuum table	K0UK4344M004	K0004344M004	K0US4344M004
Elcometer 4345/1	Motorised Applicator with Perforated Vacuum Table and Gelatine Device	K0UK4345M001	K0004345M001	K0US4345M001
Accessories	Vacuum Pump	KTUK4930M001	KT004930M001	KTUS4930M001
	Water Trump/Vacuum Pump – generates a vacuum using the mains water supply	KT004931M001		

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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 spread one or more products, with a high levelling ability, on a wide variety of substrates, even flexible ones.

- A wide range of gaps available providing a wide range of coating thicknesses: from 4 to 500µm.
- 2 film widths: 140mm (5.5") or 250mm (9.8"); other widths on request.

Ideal for use with the Elcometer 4330 or 4340 Motorised Film Applicators. See pages 24-25

A special table fitted with a clamp and a flexible mat for optimal manual application is also available.

BAR WIDTH 140mm (5.5")			
Model	Coating Thickness		Part Number
	µm	mils	
Elcometer 4361/1	4	0.157	K0004361P001
Elcometer 4361/2	6	0.236	K0004361P002
Elcometer 4361/3	8	0.315	K0004361P003
Elcometer 4361/4	10	0.393	K0004361P004
Elcometer 4361/5	12	0.472	K0004361P005
Elcometer 4361/6	15	0.590	K0004361P006
Elcometer 4361/7	20	0.787	K0004361P007
Elcometer 4361/8	25	0.984	K0004361P008
Elcometer 4361/9	30	1.181	K0004361P009
Elcometer 4361/10	34	1.338	K0004361P010
Elcometer 4361/11	38	1.496	K0004361P011
Elcometer 4361/12	40	1.574	K0004361P012
Elcometer 4361/13	45	1.771	K0004361P013
Elcometer 4361/14	50	1.968	K0004361P014
Elcometer 4361/15	55	2.165	K0004361P015
Elcometer 4361/16	60	2.362	K0004361P016
Elcometer 4361/17	65	2.559	K0004361P017
Elcometer 4361/18	70	2.755	K0004361P018
Elcometer 4361/19	75	2.952	K0004361P019
Elcometer 4361/20	80	3.149	K0004361P020
Elcometer 4361/21	90	3.543	K0004361P021
Elcometer 4361/22	100	3.937	K0004361P022
Elcometer 4361/23	110	4.330	K0004361P023
Elcometer 4361/24	120	4.724	K0004361P024
Elcometer 4361/25	130	5.118	K0004361P025
Elcometer 4361/26	140	5.511	K0004361P026
Elcometer 4361/27	150	5.905	K0004361P027
Elcometer 4361/28	160	6.299	K0004361P028
Elcometer 4361/29	180	7.086	K0004361P029
Elcometer 4361/30	200	7.874	K0004361P030
Elcometer 4361/31	300	11.811	K0004361P031
Elcometer 4361/32	400	15.748	K0004361P032
Elcometer 4361/33	500	19.685	K0004361P033
Elcometer 4361	Select any 6 from the 4361 range		K0004361M001

| BAR WIDTH 250mm (9.8")			
Model	Coating Thickness		Part Number
	µm	mils	
Elcometer 4360/1	4	0.157	K0004360P001
Elcometer 4360/2	6	0.236	K0004360P002
Elcometer 4360/3	8	0.315	K0004360P003
Elcometer 4360/4	10	0.393	K0004360P004
Elcometer 4360/5	12	0.472	K0004360P005
Elcometer 4360/6	15	0.590	K0004360P006
Elcometer 4360/7	20	0.787	K0004360P007
Elcometer 4360/8	25	0.984	K0004360P008
Elcometer 4360/9	30	1.181	K0004360P009
Elcometer 4360/10	34	1.338	K0004360P010
Elcometer 4360/11	38	1.496	K0004360P011
Elcometer 4360/12	40	1.574	K0004360P012
Elcometer 4360/13	45	1.771	K0004360P013
Elcometer 4360/14	50	1.968	K0004360P014
Elcometer 4360/15	55	2.165	K0004360P015
Elcometer 4360/16	60	2.362	K0004360P016
Elcometer 4360/17	65	2.559	K0004360P017
Elcometer 4360/18	70	2.755	K0004360P018
Elcometer 4360/19	75	2.952	K0004360P019
Elcometer 4360/20	80	3.149	K0004360P020
Elcometer 4360/21	90	3.543	K0004360P021
Elcometer 4360/22	100	3.937	K0004360P022
Elcometer 4360/23	110	4.330	K0004360P023
Elcometer 4360/24	120	4.724	K0004360P024
Elcometer 4360/25	130	5.118	K0004360P025
Elcometer 4360/26	140	5.511	K0004360P026
Elcometer 4360/27	150	5.905	K0004360P027
Elcometer 4360/28	160	6.299	K0004360P028
Elcometer 4360/29	180	7.086	K0004360P029
Elcometer 4360/30	200	7.874	K0004360P030
Elcometer 4360/31	300	11.811	K0004360P031
Elcometer 4360/32	400	15.748	K0004360P032
Elcometer 4360/33	500	19.685	K0004360P033
Elcometer 4360	Select any 6 from the 4360 range		K0004360M201

Elcometer 3520 Baker Film Applicator

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.

The Elcometer 3520 Baker Film Applicator can also be used with the Elcometer 4330 and 4340 Motorised Film Applicators (see pages 24-25).

Each Elcometer 3520 Baker Film Applicator has four fixed gap sizes and is available in a range of film widths.

Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141a 4122.1
FTMS 141a 2162	
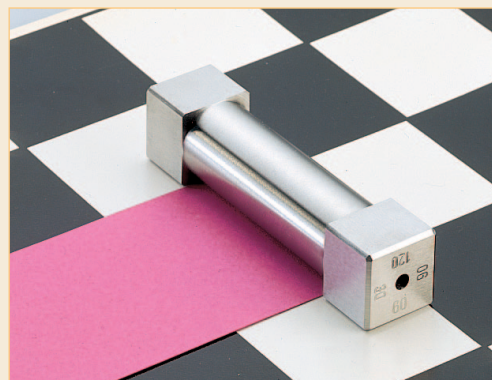
Model	Number of Gaps	Film Gaps		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3520/1	4	30, 60, 90, 120	1, 2, 3, 4	25	1	K0003520M001	K0US3520M001
Elcometer 3520/2	4	30, 60, 90, 120	1, 2, 3, 4	50	2	K0003520M002	K0US3520M002
Elcometer 3520/3	4	30, 60, 90, 120	1, 2, 3, 4	60	2.5	K0003520M003	K0US3520M003
Elcometer 3520/4	4	30, 60, 90, 120	1, 2, 3, 4	75	3	K0003520M004	K0US3520M004
Elcometer 3520/5	4	30, 60, 90, 120	1, 2, 3, 4	100	4	K0003520M005	K0US3520M005
Elcometer 3520/6	4	30, 60, 90, 120	1, 2, 3, 4	125	5	K0003520M006	K0US3520M006
Elcometer 3520/7	4	30, 60, 90, 120	1, 2, 3, 4	150	6	K0003520M007	K0US3520M007
Elcometer 3520/11	4	30, 60, 90, 120	1, 2, 3, 4	175	7	K0003520M011	K0US3520M011
Elcometer 3520/8	4	30, 60, 90, 120	1, 2, 3, 4	200	8	K0003520M008	K0US3520M008
Elcometer 3520/9	4	30, 60, 90, 120	1, 2, 3, 4	250	10	K0003520M009	K0US3520M009

Other gaps and film widths are available upon request.

Elcometer 3525 & 3530 Adjustable Baker Film Applicators

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 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 4330 and 4340 Motorised Film Applicators (see pages 24-25).

Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141 M6226
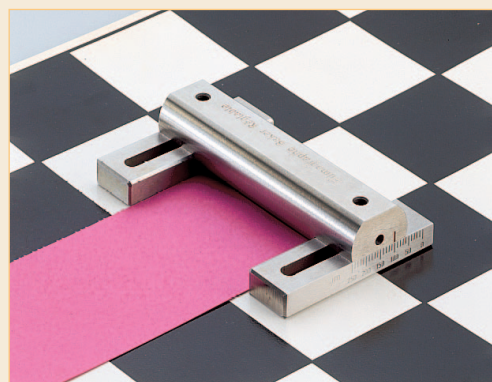
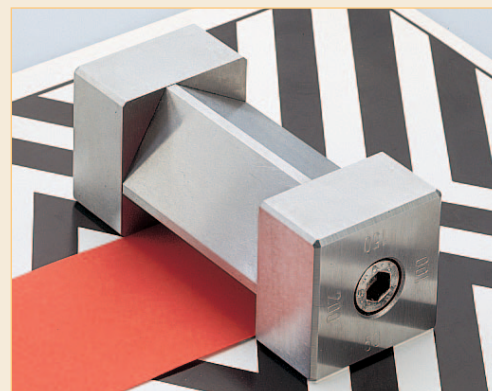| Model	Number of Gaps	Film Gaps		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3525/1	Adjustable	0-100	0-4	50	2	K0003525M001	K0US3525M001
Elcometer 3525/2	Adjustable	0-100	0-4	75	3	K0003525M002	K0US3525M002
Elcometer 3525/3	Adjustable	0-100	0-4	100	4	K0003525M003	K0US3525M003
Elcometer 3525/4	Adjustable	0-100	0-4	150	6	K0003525M004	K0US3525M004
Elcometer 3525/5	Adjustable	0-100	0-4	200	8	K0003525M005	K0US3525M005
Elcometer 3525/6	Adjustable	0-100	0-4	250	10	K0003525M006	K0US3525M006
Elcometer 3530/1	Adjustable	0-250	0-10	50	2	K0003530M001	K0US3530M001
Elcometer 3530/2	Adjustable	0-250	0-10	75	3	K0003530M002	K0US3530M002
Elcometer 3530/3	Adjustable	0-250	0-10	100	4	K0003530M003	K0US3530M003
Elcometer 3530/4	Adjustable	0-250	0-10	150	6	K0003530M004	K0US3530M004
Elcometer 3530/5	Adjustable	0-250	0-10	200	8	K0003530M005	K0US3530M005
Elcometer 3530/6	Adjustable	0-250	0-10	250	10	K0003530M006	K0US3530M006

Elcometer 3550 & 3540 Bird Film Applicators

These easy to clean gauges are manufactured to the highest accuracy. Precision ground stainless steel Bird Film Applicators have a flat edged prismatic body making them suitable for various products applied to a flat and relatively strong substrate.

The Elcometer 3550 Bird Film Applicator has 2 gap sizes, whereas the Elcometer 3540 has 4 gap sizes per applicator.

Both versions are available in a range of film widths and can be used with the Elcometer 4330 and 4340 Motorised Film Applicators (see pages 24-25).

Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141a 4122.1
FTMS 141a 2162	

Model	Number of Gaps	Film Gaps		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3550/1	1	50	2	50	2	K0003550M001	K0US3550M001
Elcometer 3550/2	1	50	2	75	3	K0003550M002	K0US3550M002
Elcometer 3550/3	1	50	2	100	6	K0003550M003	K0US3550M003
Elcometer 3550/1	1	75	3	50	2	K0003550M201	K0US3550M201
Elcometer 3550/2	1	75	3	75	3	K0003550M202	K0US3550M202
Elcometer 3550/3	1	75	3	100	6	K0003550M203	K0US3550M203
Elcometer 3540/1	4	50, 100, 150, 200	2, 4, 6, 8	50	2	K0003540M001	K0US3540M001
Elcometer 3540/2	4	50, 100, 150, 200	2, 4, 6, 8	75	3	K0003540M002	K0US3540M002
Elcometer 3540/3	4	50, 100, 150, 200	2, 4, 6, 8	100	4	K0003540M003	K0US3540M003
Elcometer 3540/4	4	50, 100, 150, 200	2, 4, 6, 8	150	6	K0003540M004	K0US3540M004
Elcometer 3540/5	4	50, 100, 150, 200	2, 4, 6, 8	200	8	K0003540M005	K0US3540M005
Elcometer 3540/6	4	50, 100, 150, 200	2, 4, 6, 8	250	10	K0003540M006	K0US3540M006

Other gaps and film widths are available upon request.

Elcometer 3545 Adjustable Bird Film Applicators

Manufactured to the same high standards as the Elcometer 3540 and 3550 Bird Film Applicators, the Elcometer 3545 Adjustable Bird Film Applicators are user adjustable.

By choosing different settings each end (using the gap size scale), a wedge shaped film can be applied.

Available in a number of film widths, these high precision applicators can be used manually or with the Elcometer 4330 and 4340 Motorised Film Applicators (see pages 24-25).

Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141a 4122.1
FTMS 141a 2162	
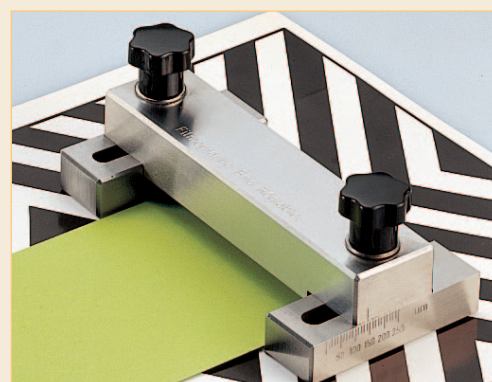
Model	Number of Gaps	Film Gaps		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3545/1	Adjustable	0-250	0-10	50	2	K0003545M201	K0US3545M201
Elcometer 3545/2	Adjustable	0-250	0-10	75	3	K0003545M002	K0US3545M002
Elcometer 3545/3	Adjustable	0-250	0-10	100	4	K0003545M203	K0US3545M203
Elcometer 3545/4	Adjustable	0-250	0-10	125	5	K0003545M004	K0US3545M004
Elcometer 3545/5	Adjustable	0-250	0-10	150	6	K0003545M005	K0US3545M005
Elcometer 3545/6	Adjustable	0-250	0-10	175	7	K0003545M006	K0US3545M006
Elcometer 3545/7	Adjustable	0-250	0-10	200	8	K0003545M007	K0US3545M007
Elcometer 3545/8	Adjustable	0-250	0-10	250	10	K0003545M008	K0US3545M008

Elcometer 3580 Casting Knife Film Applicator

Manufactured in anodised aluminium, with a bevelled blade applicator body, the Elcometer 3580 is suitable for manually applying thick layers of various products, on solid and flat substrates.

The film gap can be adjusted in 1micron steps from 0 to 6mm by means of two integrated micrometric screws.

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

Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141a 4122.1
FTMS 141a 2162	

Model	Description	Gap Size	Film Width		Part Number
		µm	mm	inches	
Elcometer 3580/1	1µm Adjustable Applicator	0-6000	50	2	K0003580M201
Elcometer 3580/2	1µm Adjustable Applicator	0-6000	75	3	K0003580M202
Elcometer 3580/3	1µm Adjustable Applicator	0-6000	100	4	K0003580M203
Elcometer 3580/4	1µm Adjustable Applicator	0-6000	125	5	K0003580M204
Elcometer 3580/5	1µm Adjustable Applicator	0-6000	150	6	K0003580M005
Elcometer 3580/6	1µm Adjustable Applicator	0-6000	175	7	K0003580M006
Elcometer 3580/7	1µm Adjustable Applicator	0-6000	200	8	K0003580M007

Also available in Stainless Steel – contact Elcometer for further information

Elcometer 3570 Micrometric Aluminium Film Applicators

Made of anodised aluminium with a reservoir and a bevelled blade applicator body. The Elcometer 3570 is suitable for high-precision manual application of many materials onto relatively firm substrates.

The gap can be adjusted in 1micron intervals from 0 to 1mm by the inclination of the device, using a micrometric screw.
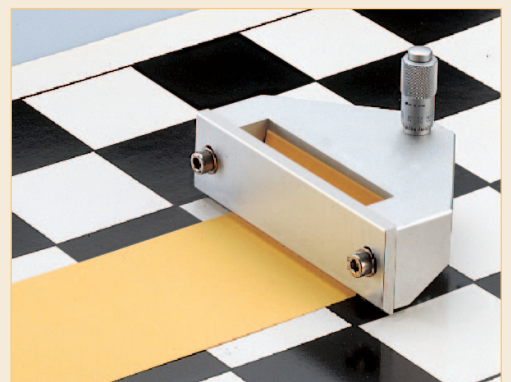
Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141a 4122.1
FTMS 141a 2162	

Model	Description	Gap Size	Film Width		Part Number
		µm	mm	inches	
Elcometer 3570/1	1µm Adjustable Applicator	0-1000	75	3	K0003570M201
Elcometer 3570/2	1µm Adjustable Applicator	0-1000	100	4	K0003570M002
Elcometer 3570/4	1µm Adjustable Applicator	0-1000	150	6	K0003570M004
Elcometer 3570/3	1µm Adjustable Applicator	0-1000	200	8	K0003570M003

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Elcometer 3600 Doctor Blade Film Applicators

Made of hardened stainless steel with a flat-edged bevelled blade applicator body, these adjustable applicators are suitable for various products applied on flat and relatively firm surfaces.

Supplied with a set of nineteen thickness gauges from 30 to 1000µm (1 to 40mils) to allow the accurate setting of the gap by vertical adjustment of the scraper.

The Elcometer 3600 Doctor Blade Film Applicator has a maximum gap size of 3mm and is available in a range of film widths.

Our Doctor Blade film applicators can be used with the Elcometer 4330 and the Elcometer 4340 range of Motorised Film Applicators (see pages 24-25).

Can be used in accordance with:	
ASTM D 823	FTMS 141 a M4121
FTMS 141 a 4122.1	FTMS 141 a 2161
FTMS 141 a 2162	FTMS 141 a 6226

Model	Description	Gap Size		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3600/1	Blade Applicator with thickness gauges	30-1000	1-40	50	2	K0003600M201	K0US3600M201
Elcometer 3600/2	Blade Applicator with thickness gauges	30-1000	1-40	75	3	K0003600M002	K0US3600M002
Elcometer 3600/3	Blade Applicator with thickness gauges	30-1000	1-40	100	4	K0003600M203	K0US3600M203
Elcometer 3600/4	Blade Applicator with thickness gauges	30-1000	1-40	150	6	K0003600M204	K0US3600M204
Elcometer 3600/5	Blade Applicator with thickness gauges	30-1000	1-40	200	8	K0003600M205	K0US3600M205
Elcometer 3600/6	Blade Applicator with thickness gauges	30-1000	1-40	225	9	K0003600M206	K0US3600M206
Accessories	19 Thickness Gauges for Calibration					KT003600P001	KTUS3600P001

Elcometer 3700 Doctor Blade Film Applicators with Reservoir

Made of hardened stainless steel with a flat edge bevelled blade applicator body, the Elcometer 3700 is suitable for gelatine or other products with low viscosity. The product is applied on flat and relatively firm surfaces in a range of film widths.

Supplied with a set of nineteen gauges from 30 to 1000µm (1 to 40mils) to accurately set the gap by vertical adjustment of the scraper. Maximum gap size: 4mm (0.157").

Can also be used with the Elcometer 4330 and the Elcometer 4340 range of Motorised Automatic Film Applicators and is available with four spreading values - see the Elcometer 3560 on page 31.

Can be used in accordance with:	
ASTM D 823	FTMS 141 a M4121
FTMS 141 a 4122.1	FTMS 141 a 6226

Model	Description	Gap Size		Film Width		Part Number	
		µm	mils	mm	inches	Metric	Imperial
Elcometer 3700/3	Reservoir Applicator with thickness gauges	30-1000	1-40	80	4	K0003700M203	K0US3700M203
Elcometer 3700/2	Reservoir Applicator with thickness gauges	30-1000	1-40	180	8	K0003700M002	K0US3700M002
Elcometer 3700/1	Reservoir Applicator with thickness gauges	30-1000	1-40	250	10	K0003700M001	K0US3700M001
Accessories	19 Thickness Gauges for Calibration					KT003600P001	KTUS3600P001

Elcometer 3800 & 3805 Multiple Film Doctor Blade Applicators

Made of anodised aluminium, ideal for applying 2 or 3 stripes of film side by side on a contrast chart, which slides manually between the film applicator filled with the product and its support - between 2 side guides.

Supplied with a set of nineteen gauges either from 30 to 1000µm or 1 to 40mils to adjust the gap of the spreader blade and a pack of 100 varnished contrast charts measuring 21 x 7.5cm (8.25 x 3").

2 models available: Applicator with 2 reservoirs or Applicator with 3 reservoirs.
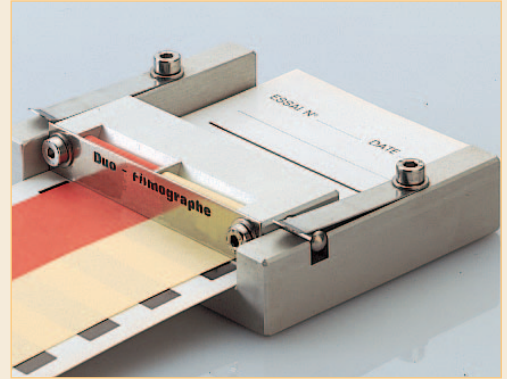
Can be used in accordance with:	
ASTM D 823	FTMS 141 M6226
FTMS 141 a 4122.1	

Model	Number of Stripes	Type	Film Gaps		Film Width		Part Number	
			µm	mils	mm	inches	Metric	Imperial
Elcometer 3800/1	2	Multiple Film Applicator with thickness gauges	30-1000	1-40	28	1	K0003800M001	K0US3800M001
Elcometer 3805/1	3	Multiple Film Applicator with thickness gauges	30-1000	1-40	18	0.70	K0003805M001	K0US3805M001
Accessories		19 Thickness Gauges for Calibration					KT003600P001	KTUS3600P001

Elcometer 3508 & 3560 4 Gap Applicator with Reservoir

A simple gauge with a single reservoir allowing the user to generate 4 different thicknesses of coating.

These stainless steel applicators are made with 4 straight spreading edges of fixed film gaps.

The Elcometer 3508 4 Gap Applicator with 2 reservoirs has been designed specifically for the generation of test samples for use with the Elcometer 1720 Abrasion, Scrubbing and Washability Tester (see page 42).
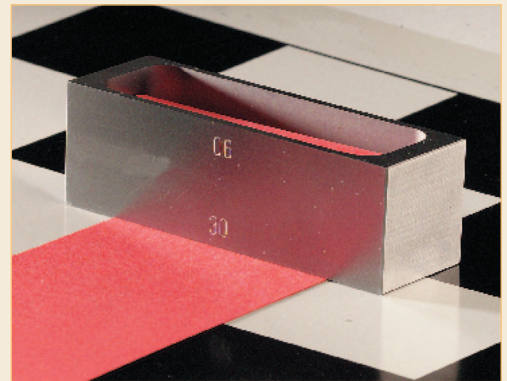
Can be used in accordance with:	
ASTM D 3022	ASTM D 823
FTMS 141a M2161	FTMS 141 a 2162

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

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Elcometer 3505 Cube Film Applicators

Made of hardened stainless steel with a bevelled flat-edged blade, these applicators apply films 12mm (0.5") wide. Generally on any flat and firm surface and especially on glass for evaluation of drying time.

A set of five reservoirs to apply 5 stripes of film at the same time is also available. Ideal for simultaneously studying several different products. The film spacing matches the gliders of the drying time system of the Elcometer 4341 Motorised Film Applicators (see page 25).

Supplied with a set of nineteen gauges either from 30 to 1000µm or 1 to 40mils to adjust the gap of the spreader blade.
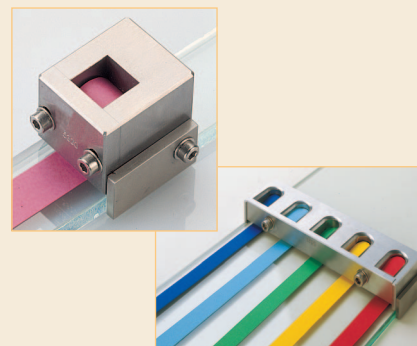
Model	Number of Stripes	Type	Film Gaps		Film Width		Part Number	
			µm	mils	mm	inches	Metric	Imperial
Elcometer 3505/1	1	Cube Applicator with thickness gauges	30-1000	1-40	12	0.5	K0003505M001	K0US3505M001
Elcometer 3505/2	5	Cube Applicator with thickness gauges	30-1000	1-40	12	0.5	K0003505M202	K0US3505M202
Accessories	19 Thickness Gauges for Calibration						KT003600P001	KTUS3600P001

Elcometer 4170 Traffic Paint Film Applicator

This instrument is specially designed to spread paints containing glass beads onto rigid plate bases made of glass, cement, metal, plastic etc.

The applied films are clean and flawless. The thickness of the coating is obtained by combining the various gauges supplied with the apparatus – from 0.3 to 1mm (12 – 40mils).

Supplied with 2 stainless steel collecting trays.

Model	Description	Part Number
Elcometer 4170	Elcometer 4170 Traffic Paint Film Applicator	K0004170M001
Accessories	Glass Plates -100 pieces 15 x 15cm (5.9 x 5.9")	KT004170N001

Elcometer 4800 & 4900 Vacuum Tables

Elcometer offer a wide range of vacuum tables to provide an ideal surface for manual application of films on test charts or samples. Available in two formats:

- The Elcometer 4800 - these aluminium tables with a channel around the edge hold thin, flexible test pieces e.g. test charts, plastic film and paper absolutely flat.
- The Elcometer 4900 - made of perforated aluminium, keep a wider range of test pieces absolutely flat, including glass, plastic sheets, contrast charts etc.

Both the Elcometer 4800 and Elcometer 4900 can be supplied with thermostatic control or electrically-heated versions.

Model	Description	Effective Dimensions		Part Number
		cm	inches	
Elcometer 4800/1	Channelled Vacuum Table	14.5 x 25	6 x 10	K0004800M001
Elcometer 4800/2	Channelled Vacuum Table	22 x 30	8.5 x 12	K0004800M002
Elcometer 4900/1	Perforated Vacuum Table	22 x 30	8.5 x 12	K0004900M001
Elcometer 4900/2	Perforated Vacuum Table	30 x 45	12 x 18	K0004900M002
Elcometer 4920/1	Perforated Vacuum Table - Electrically heated	22 x 30	8.5 x 12	K0004920M201
Accessories	240Volt Vacuum pump - used to provide vacuum to the Vacuum Tables			KTUK4930M001
	220Volt Vacuum pump - used to provide vacuum to the Vacuum Tables			KT004930M001
	110Volt Vacuum pump - used to provide vacuum to the Vacuum Tables			KTUS4930M001
	Water Vacuum trump – connected to the mains water to provide vacuum by depression			KT004931M001

Elcometer 4500 Pfund Cryptometers

This practical instrument measures accurately the hiding power of paint, in relation to their thickness.

A small quantity of product is laid down on a flat opaque glass plate, black or white depending on the model, bearing a scale graduated from 0 to 50mm.

A second transparent glass (or cursor) traps the film. The cursor is moved forwards and backwards.

Model	Description	Part Number
Elcometer 4500/1	Pfund Cryptometer with white background, for dark paints, supplied with cursor K = 0.0035	K0004500M201
Elcometer 4500/2	Pfund Cryptometer with black background, for light paints, supplied with cursor K = 0.007	K0004500M002
Elcometer 4500/3	Pfund Cryptometer with half-black, half-white background, with cursors K = 0.007 and K = 0.002	K0004500M003
Accessories	Cursor Wedge – K = 0.007	KT004500P001
	Cursor Wedge – K = 0.0035	KT004500P002
	Cursor Wedge – K = 0.002	KT004500P003

Leneta Test Charts

Elcometer supply a wide range of Leneta Test Charts, from plain white to those having different patterns of black and white. Produced from high quality, non-fluorescent paper, free of optical brighteners that may affect colour measurements, Leneta Test Charts are the market standard in today's coatings industry.

Substrates of steel or aluminium foil cards, glass and plastic are also available.

Contact Elcometer for further information.

Can be used in accordance with: ASTM D344, ASTM D2805; ASTM D2243; ASTM D3022; DIN 53162; FTMS 141a M4121; ISO 2814.

Brief Descriptions:

Opacity Charts:	Used to test the hiding power of the coating, using large black and white areas
Penopac Charts:	Combine penetration and opacity tests in one chart
Display Charts:	Use diagonal patterns to help demonstrate visibly, the hiding power of a coating
Opacity-Display Charts:	Combines large black and white areas with diagonal patterns
Spreading Rate Charts:	Larger than other charts, used to measure the spreading rate of a coating
Brushout Cards:	Thicker paper is used for the testing of coatings applied with a brush or roller
Duplex Applicator Charts:	Used in conjunction with the Duplex Film Applicator to test two coatings at the same time
Unvarnished Charts:	Semi-porous charts which are ideal for clear coatings and stains
Grey Scale Charts:	A range of stripes, increasing in contrast – ideal for rating the hiding power of a coating
Spray Monitors:	Self-adhesive charts, usually applied to metal panels for testing sprayed and OEM coatings
Scrub Test Panels:	Used to measure the abrasion of a coating, using the Elcometer 1720 – see page 42
Metopac™ Test Panels:	Painted steel panels used to measure the hiding power of powder coatings

Opacity Charts

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

Form 2A   Form 2C   Form 5C   Form 3B   Form 15H   Form 14H

Model	Description	Quantity per Pack	Dimensions		Part Number
			mm	inches	
Elcometer 4695/3	Leneta Opacity Chart 2A	140 x 254	$5^{1}/_{2}$ x 10	250	K0004695M003
Elcometer 4695/4	Leneta Opacity Chart 2C	194 x 260	$7^{5}/_{8}$ x $10^{1}/_{4}$	250	K0004695M004
Elcometer 4695/6	Leneta Opacity Chart 3B	194 x 289	$7^{5}/_{8}$ x $11^{3}/_{8}$	250	K0004695M006
Elcometer 4695/15	Leneta Opacity Chart 5C	194 x 260	$7^{5}/_{8}$ $10^{1}/_{4}$	250	K0004695M015
Elcometer 4695/36	Leneta Opacity Chart 14H	286 x 438	$11^{1}/_{4}$ x $17^{1}/_{4}$	125	K0004695M036
Elcometer 4695/37	Leneta Opacity Chart 15H	286 x 438	$11^{1}/_{4}$ x $17^{1}/_{4}$	125	K0004695M037

Film Application & Test Charts

Penopac Charts

These combine the test areas and functions of a PENetration and an OPACity chart. They can be considered as universal test charts for research, development and quality control. The choices offered in size and design are responsive to individual laboratory needs and preferences. Form 19BR includes an un-lacquered black area, but is otherwise equivalent in functionality.

| Form 1A | Form 18A | Form 1B | Form 18B | Form 19BR |

s = sealed
u = unsealed
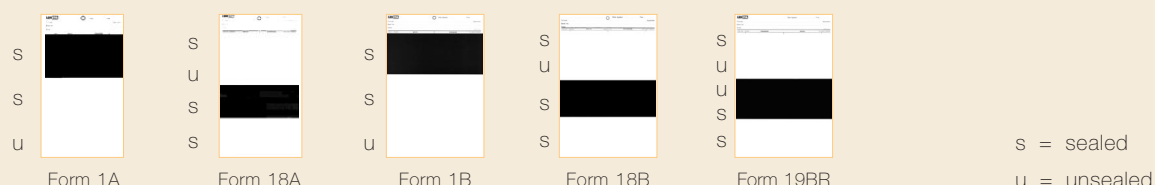
Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/1	Leneta Penopac Chart 1A	140 x 254	$5^1/_2$ x 10	250	K0004695M001
Elcometer 4695/2	Leneta Penopac Chart 1B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M002
Elcometer 4695/38	Leneta Penopac Chart 18A	140 x 254	$5^1/_2$ x 10	250	K0004695M038
Elcometer 4695/39	Leneta Penopac Chart 18B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M039
Elcometer 4695/40	Leneta Penopac Chart 19BR	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M040

Display Charts/Spreading Rate Charts

These charts employ time-tested diagonally striped patterns, having a strong visual impact that emphasizes variations in film opacity. They are frequently used for hiding power display purposes, by means of drawdowns or brushouts. Grey stripes in Forms 8H-GW and 8K-GW provide reduced substrate contrast for use with low hiding power coatings. Spreading Rate Charts (Forms 8H and 8H-GW) 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.

Display Charts

| Form 8A | Form 8B | Form 8K |

Spreading Rate Charts

| Form 8H | Form 8H-GW | Form 8K-GW |
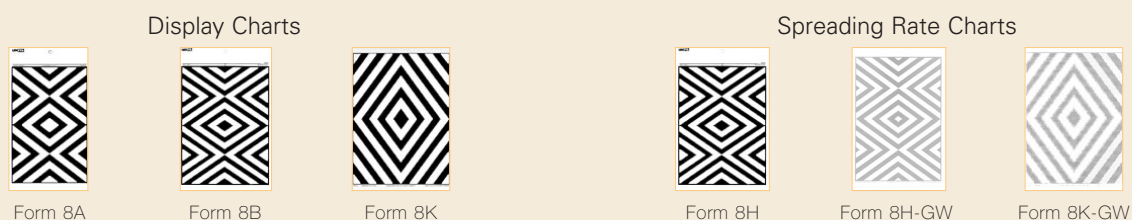
Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/21	Leneta Display Chart 8A	140 x 254	$5^1/_2$ x 10	250	K0004695M021
Elcometer 4695/22	Leneta Display Chart 8B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M022
Elcometer 4695/25	Leneta Display Chart 8K	219 x 285	$8^5/_8$ x $11^1/_4$	250	K0004695M025
Elcometer 4695/23	Leneta Spreading Rate Chart 8H	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M023
Elcometer 4695/24	Leneta Grey/White Spreading Rate Chart 8H-GW	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M024
Elcometer 4695/26	Leneta Grey/White Spreading Rate Chart 8K-GW	219 x 285	$8^5/_8$ x $11^1/_4$	250	K0004695M026

Appearance (Gloss, Haze, Shade, Opacity, Colour)
see pages 59-79

Opacity-Display Charts/Spreading Rate Charts

Charts of this type combine the large, unbroken areas that are characteristic of Opacity Charts, with the striped design of a Display Chart. The larger areas permit wide aperture photometric measurements and visual colour comparisons, while the striped area is uniquely effective for hiding power comparison and display. Spreading Rate Charts (Forms 12H and 13H) are accurately 0.1 square metres (approximately one square foot) in area, and are designed for brushout application at specified spreading rates.

Display Charts

Form 9A Form 9B Form 21B

Spreading Rate Charts

Form 12H Form BH

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/27	Leneta Opacity/Display Chart 9A	140 x 254	$5^1/_2$ x 10	250	K0004695M027
Elcometer 4695/28	Leneta Opacity/Display Chart 9B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M028
Elcometer 4695/41	Leneta Opacity/Display Chart 21B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M041
Elcometer 4695/33	Leneta Spreading Rate Chart 12H	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M033
Elcometer 4695/34	Leneta Spreading Rate Chart 13H	286 x 438	$11^1/_4$ x $17^1/_4$	250	K0004695M034

Checkerboard Charts/Spreading Rate Charts

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 of which Forms 10H and 10H-BG Spreading Rate Charts are typical examples. Designed for brushout tests at specified spreading rates such as in ASTM Method D 344 and Canadian 1-GP-71, they are also used for drawdown applications like their smaller counterparts Forms 10A and 10B. Black and grey squares in Form 10H-BG provide reduced contrast for testing coatings with lower hiding power.

Display Charts

Form 10A Form 10B

Spreading Rate Charts

Form 10H Form 10H-BG

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/29	Leneta Checkerboard Chart 10A	140 x 254	$5^1/_2$ x 10	250	K0004695M029
Elcometer 4695/30	Leneta Checkerboard Chart 10B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M030
Elcometer 4695/31	Leneta Checkerboard Spreading Rate Chart 10H	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M031
Elcometer 4695/32	Leneta Checkerboard Spreading Rate Chart 10H-BG	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M032

Washability, Brushability & Abrasion
see pages 41-46

Brushout Cards

Designed for informal brushout applications, the paper stock is almost twice the thickness of regular chart paper to give greater rigidity for more convenient handling - nominal thickness: 0.5mm (20mils).

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

Form 2DX   Form 5DX   Form 5DX-GW   Form WDX

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/5	Leneta Brushout Chart 2DX	98 x 152	$3^7/_8$ x 6	500	K0004695M005
Elcometer 4695/16	Leneta Brushout Chart 5DX	98 x 152	$3^7/_8$ x 6	500	K0004695M016
Elcometer 4695/17	Leneta Chart 5DX-GW	98 x 152	$3^7/_8$ x 6	500	K0004695M017
Elcometer 4695/102	Leneta Plain White Card WDX	98 x 152	$3^7/_8$ x 6	500	K0004695M102

Duplex Applicator Cards

Originally made to be used with the Duplex Film Applicator (see page 31), an instrument designed for rapid production of side-by-side drawdowns, they now serve mostly as generic paint test charts.

Form 6F6   Form 6F4   Form WF

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/18	Leneta Chart 6F4	76 x 184	3 x $7^1/_4$	500	K0004695M018
Elcometer 4695/19	Leneta Duplex Applicator Chart 6F6	76 x 184	3 x $7^1/_4$	500	K0004695M019
Elcometer 4695/103	Leneta Plain White Chart WF	76 x 184	3 x $7^1/_4$	1000	K0004695M103

Plain White & Plain Black Charts Cards

Available in varying thicknesses and size.

The Leneta WBX, WDX, WA, and WB cards all come with a convenience hole at the top.

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/100	Leneta Plain White Chart WBX – 0.5mm (20mils)	194 x 286	$7^5/_8$ x $11^1/_4$	125	K0004695M100
Elcometer 4695/102	Leneta Plain White Chart WDX – 0.5mm (20mils)	98 x 152	$3^7/_8$ x 6	500	K0004695M102
Elcometer 4695/106	Leneta Plain White Chart WHX – 0.5mm (20mils)	286 x 438	$11^1/_4$ x $17^1/_4$	75	K0004695M106
Elcometer 4695/108	Leneta Plain White Chart WKX – 0.5mm (20mils)	219 x 286	$8^5/_8$ x $11^1/_4$	125	K0004695M108
Elcometer 4695/98	Leneta Plain White Chart WA – 0.3mm (12mils)	140 x 254	$5^1/_2$ x 10	250	K0004695M098
Elcometer 4695/99	Leneta Plain White Chart WB – 0.3mm (12mils)	194 x 286	$7^5/_8$ x $11^1/_2$	250	K0004695M099
Elcometer 4695/101	Leneta Plain White Chart WD – 0.3mm (12mils)	98 x 152	$3^7/_8$ x 6	1000	K0004695M101
Elcometer 4695/104	Leneta Plain White Chart WG – 0.3mm (12mils)	76 x 140	3 x $5^1/_2$	1000	K0004695M104
Elcometer 4695/105	Leneta Plain White Chart WH – 0.3mm (12mils)	286 x 438	$11^1/_4$ x $17^1/_4$	125	K0004695M105
Elcometer 4695/107	Leneta Plain White Chart WK – 0.3mm (12mils)	219 x 286	$8^5/_8$ x $11^1/_4$	250	K0004695M107
Elcometer 4695/109	Leneta Plain White Chart WM – 0.3mm (12mils)	140 x 286	$5^1/_4$ x $11^1/_4$	250	K0004695M109
Elcometer 4695/49	Leneta Plain Black Chart BH – 0.3mm (12mils)	219 x 286	$11^1/_4$ x $17^1/_4$	125	K0004695M049
Elcometer 4695/50	Leneta Plain Black Chart BK – 0.3mm (12mils)	286 x 438	$8^5/_8$ x $11^1/_4$	250	K0004695M050

Unvarnished Test Charts

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

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

Form N2C

Form N2A

Form N9A

Form NWK

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/65	Leneta Unvarnished Chart N2C	194 x 260	$7^5/_8$ x $10^1/_4$	250	K0004695M065
Elcometer 4695/64	Leneta Unvarnished Chart N2A	140 x 254	$5^1/_2$ x 10	250	K0004695M064
Elcometer 4695/66	Leneta Unvarnished Chart N9A	140 x 254	$5^1/_2$ x 10	250	K0004695M066
Elcometer 4695/67	Leneta Unvarnished Chart NWK	219 x 286	$8^5/_8$ x $11^1/_4$	250	K0004695M067

Grey Scale Charts

These are sealed paint test charts with six stripes on a white field, ranging in shade from very light grey to black. The stripes are numbered 1 to 6, representing uniform steps of increasing contrast. The hiding power of the applied coatings is rated as the number of the darkest stripe that is completely (or almost completely) obscured, at a specified thickness or spreading rate. Form CU-1 is used for more practical large-area brush or roller applications as in ASTM D5150. Applications on Form 24B are with a drawdown blade.

Form CU-1

Form 24B

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/53	Leneta Chart CU-1	610 x 946	24 x $37^1/_4$	100	K0004695M053
Elcometer 4695/43	Leneta Chart 24B	194 x 289	$7^5/_8$ x $11^3/_8$	250	K0004695M043

Spray Strips – Hiding Power for OEM Coatings

These are used by industrial coatings laboratories, principally those involved with the automotive industry, to measure the hiding power of spraying enamels. The chart is attached to a steel panel and the test coating sprayed to produce a "wedge" varying from thin at one end to thick at the other.

After drying, a location on the chart of adequate visual hiding or 0.98 contrast ratio is determined, and the film thickness measured electronically on the steel panel adjacent to that location. Conversely, a location of specified thickness is determined on the steel panel and the contrast ratio measured adjacent to that location.

Available in Black/ White, Grey/ White and, for the S71, Red/Grey.

Form S71

Form S71-BG

Form S72

Form S72-BG

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/89	Leneta Black/White Spray Strips S71	51 x 279	2 x 11	500	K0004695M089
Elcometer 4695/90	Leneta Black/Grey Spray Strips S71-BG	51 x 279	2 x 11	500	K0004695M090
Elcometer 4695/91	Leneta Red/Grey Spray Strips S71-RG	51 x 279	2 x 11	500	K0004695M091
Elcometer 4695/92	Leneta Black/White Spray Strips S72	51 x 279	2 x 11	500	K0004695M092
Elcometer 4695/93	Leneta Black/Grey Spray Strips S72-BG	51 x 279	2 x 11	500	K0004695M093

Film Application & Test Charts

Spray Monitors – Self Adhesive Hiding Power Labels

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 uniform surface provides no visual clue as to the thickness of an applied paint film.

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

Available in Black/ White, Black/Grey and also Red/Grey (not shown).

Form M33   Form M33-BG

Form M12   Form M12-BG
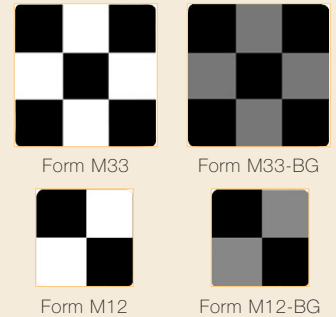
Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/59	Leneta Spray Monitor (Black/White) M33	51 x 51	2 x 2	500	K0004695M059
Elcometer 4695/58	Leneta Spray Monitor (Black/Grey) M33-BG	51 x 51	2 x 2	500	K0004695M058
Elcometer 4695/60	Leneta Spray Monitor (Red/Grey) M33-RG	51 x 51	2 x 2	500	K0004695M060
Elcometer 4695/56	Leneta Spray Monitor (Black/White) M12	25 x 25	1 x 1	2000	K0004695M056
Elcometer 4695/55	Leneta Spray Monitor (Black/Grey) M12-BG	25 x 25	1 x 1	2000	K0004695M055
Elcometer 4695/57	Leneta Spray Monitor (Red/Grey) M12-RG	25 x 25	1 x 1	2000	K0004695M057
Elcometer 4695/61	Leneta Spray Monitor (Black/White) M71	51 x 279	2 x 11	500	K0004695M061
Elcometer 4695/62	Leneta Spray Monitor (Black/Grey) M71-BG	51 x 279	2 x 11	500	K0004695M062
Elcometer 4695/63	Leneta Spray Monitor (Black/White) M72	51 x 279	2 x 11	500	K0004695M063
Elcometer 4695/79	Leneta Spray Monitor (Black/Grey) M72-BG	51 x 279	2 x 11	500	K0004695M079

Scrub Test Panels – Plastic-Vinyl Chloride/Acetate Copolymer

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

In ASTM D2486, 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 cycles as a measure of scrub resistance, with calculation of equivalent loss in film thickness.

Used in ASTM D2486, ASTM D4213, ISO 11918 and other Scrub Test Methods.

Fig. 1 and Fig. 2 show actual tests of latex flat paints. Note the films have worn down to a feather edge, with no sign of adhesion failure.

Form P121-10N
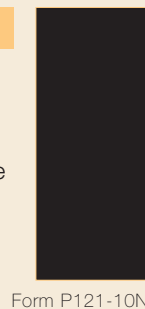
Fig 1. Typical failure using shim per ASTM D2486 Method A

Fig 2. Typical failure without shim

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/68	Leneta Black Scrub Test Panel P121-10N 0.25mm thick	165 x 432	6$\frac{1}{2}$ x 17	100	K0004695M068
Elcometer 4695/69	Leneta White Scrub Test Panel P122-10N 0.25mm thick	165 x 432	6$\frac{1}{2}$ x 17	100	K0004695M069

Metopac™ Metal Test Panels

Painted steel panels, used for measuring the hiding power of powder coatings and industrial enamels. Available in half black/half white and all black.

The black surface: Solvent Resistant, Non-bleeding, Reflectance - 1% maximum - measured using ASTM Method E1347
White Surface: Solvent Resistant, Colour Retentive, Reflectance - 80% minimum - measured using ASTM Method E1347

Major uses include: ASTM Method D6441 - Measuring the Hiding Power of Powder Coatings
Powder Coatings Institute Method
ASTM Method D2805 - Hiding Power of Paints by Reflectometry

T12M T22M
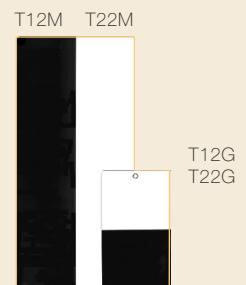
T12G
T22G

Model	Description	Dimensions		Quantity per Pack	Part Number
		mm	inches		
Elcometer 4695/94	Leneta Metopac™ Panel (Black & White) T12G	76 x 132	3 x 5$\frac{3}{16}$	125	K0004695M094
Elcometer 4695/95	Leneta Metopac™ Panel (Black & White) T12M	132 x 279	5$\frac{3}{16}$ x 11	50	K0004695M095
Elcometer 4695/96	Leneta Metopac™ Panel (Black) T22G	76 x 132	3 x 5$\frac{3}{16}$	125	K0004695M096
Elcometer 4695/97	Leneta Metopac™ Panel (Black) T22M	132 x 279	5$\frac{3}{16}$ x 11	50	K0004695M097

Drying Time

When developing a process, it is often important to know the exact time it takes for the coating to dry or cure.

There are many stages to the coating drying time. Once a coating has been applied, the first stage is that the coating levels off under gravity. Once a coating begins to cure, a thin dry film appears on the surface. The coating then continues to dry and finally after a period of time, the coating is totally cured.

But how do you know when a coating is totally dry?

Using an Elcometer Drying Time Recorder, the operator can easily identify each of the stages of the drying process.

A ball tip is placed into the coating and, using the mathematical formula: *Distance = Speed x Time*; the Elcometer Drying Time Recorder begins to move this ball at a predefined speed. As the coating dries, the trace left in the coating by the ball identifies each stage of the cure.

Elcometer 5500 Circular Ball Type Drying Time Recorder

This simple device uses the principle of distance = speed x time to determine the drying time of a coating.

A rod with a ball tip is brought into contact with a test piece of fresh paint under a load of 12g (0.42oz) and traces a circumference of 50mm (1.96″).

The drying time is evaluated from the condition of the trace and measured with a template with time markings.

Model	Description	Number of Speeds	Speed	Part Number		
				UK 240V	EUR 220V	US 110V
Elcometer 5500/1	Elcometer 5500 Circular Ball-Drying Time Recorder	1	1 revolution every 1 hour	K0UK5500M001	K0005500M001	K0US5500M001
Elcometer 5500/2	Elcometer 5500 Circular Ball-Drying Time Recorder	1	1 revolution every 6 hours	K0UK5500M002	K0005500M002	K0US5500M002
Elcometer 5500/3	Elcometer 5500 Circular Ball-Drying Time Recorder	1	1 revolution every 12 hours	K0UK5500M003	K0005500M003	K0US5500M003
Elcometer 5500/4	Elcometer 5500 Circular Ball-Drying Time Recorder	1	1 revolution every 24 hours	K0UK5500M004	K0005500M004	K0US5500M004
Elcometer 5500/6	Elcometer 5500 Circular Ball-Drying Time Recorder	6	1 revolution every $1/2$, 1, 2, 6 12 or 24 hours	K0UK5500M006	K0005500M006	K0US5500M006
Accessories	Spare Ball Tool			KT005500P001		

elcometer®

Elcometer 5300 Ball Type Drying Time Recorder

Designed to determine paint drying time by linear recording, with up to 10 test positions. Ten rods with hemispherical tips, fitted to a carriage, are brought into contact with the fresh film from one end of the test piece and moved lengthwise on the samples. The drying time is calculated from the distance travelled, measured using a graduated rule along the edge, corresponding to the various stages observed on the trace.

The coatings are applied beforehand on glass strips 25mm (0.98") wide and 70cm (27.5") long. Using the Elcometer 3505 Cube Film Applicator it is possible to apply up to five products simultaneously on a glass plate.

- The drying time recorder automatically stops at the end of travel.
- The loading on each ball is 11g, although additional weights can bring this load up to 21g.
- Supplied with 10 rods, 12 glass strips and 10 x 10g weights.
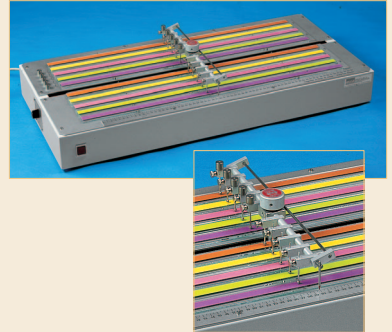
Model	Description	Number of Speeds	Part Number		
			UK 240V	EUR 220V	US 110V
Elcometer 5300/1	Linear Ball-Drying Time Recorder	1	K0UK5300M001	K0005300M001	K0US5300M001
Elcometer 5300/2	Linear Ball-Drying Time Recorder - 12 Glass Plates	6	K0UK5300M002	K0005300M002	K0US5300M002
Elcometer 5300/3	Linear Ball-Drying Time Recorder - 2 Large Plates	1	K0UK5300M003	K0005300M003	K0US5300M003
Elcometer 5300/4	Linear Ball-Drying Time Recorder - 2 Large Plates	6	K0UK5300M004	K0005300M004	K0US5300M004
Accessories	Spare Glass Rule 700 x 25mm (28 x 1") - set of 10		KT005300P001		
	Spare Ball Tool - set of 5		KT005300P002		
	Additional 10g Overload - set of 5		KT005300P003		
	Spare Glass Plate 700 x 145mm (28 x 5.7") - set 6		KT005300P004		
	Elcometer 3505 Cube Film Applicator		(see page 32)		

Elcometer 5700 Drying Time for Traffic Paints

A cylinder fitted with 2 special normalized rubber O-rings is rolled down a slope at regular intervals over a sample.

The drying-time is when the O-rings are free of any trace of paint.

Model	Description	Part Number
Elcometer 5700	Elcometer 5700 Drying Time for traffic paints	K0005700M001
Accessories	Pair of O-rings for ASTM D711-89	KT005700P001
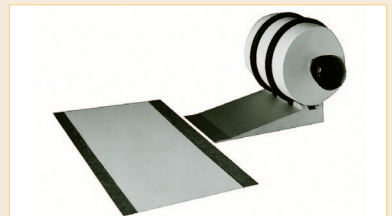
Can be used in accordance with:

ASTM D 711

Elcometer 5100 Payne Permeability Cups

Instrument made entirely of anodised aluminium, used to determine the permeability of films of paint, varnish, plastic, cellophane, etc.

The film is gripped between a ring fitted with a seal and the cup, which contains a quantity of water.

The water evaporates and after a certain time the weight loss relative to the film thickness is calculated, indicating the degree of permeability.
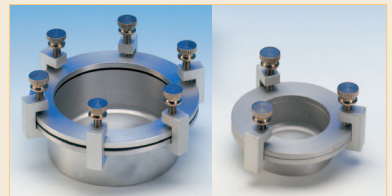
Can be used in accordance with:

ASTM E 96-80	ISO 7783
NF T 30-018	

Model	Description	Area		Part Number
		cm²	sq. inch	
Elcometer 5100/1	Elcometer 5100 Payne Permeability Cup	10	1.55	K0005100M201
Elcometer 5100/2	Elcometer 5100 Payne Permeability Cup	30	4.65	K0005100M202
Elcometer 5100/3	Elcometer 5100 Payne Permeability Cup	50	7.75	K0005100M203
Accessories	Spare Rubber Seal for Elcometer 5100/1			KT005100P001
	Spare Rubber Seal for Elcometer 5100/2			KT005100P002
	Spare Rubber Seal for Elcometer 5100/3			KT005100P003

Washability, Brushability & Abrasion Testers

Improved mechanical resistance is part of today's quality requirements. One important criteria for assessing this feature is abrasion resistance. Depending on the nature and purpose of product, various testing methods are available.

There are testing methods related 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.

To meet industry's growing needs for research and control, Elcometer develops, manufactures and supplies a range of instruments designed for wear resistance tests. Standardised or conventional, these tests are widely used for numerous applications.

Elcometer 1730 Car Wash Simulator

This simulator is used to characterise the resistance of coatings against the action of rotating brushes.

During the test, a coated test sample is continuously wetted with a mixture of detergent, water and abrasive powder (alumina) while being attacked by a rotating car wash brush. The superficial damage after a number of rotations is evaluated by measuring the loss of gloss.

The "Car Wash Simulator" meets the specifications of the test methods developed by Renault and Peugeot-Citroën.
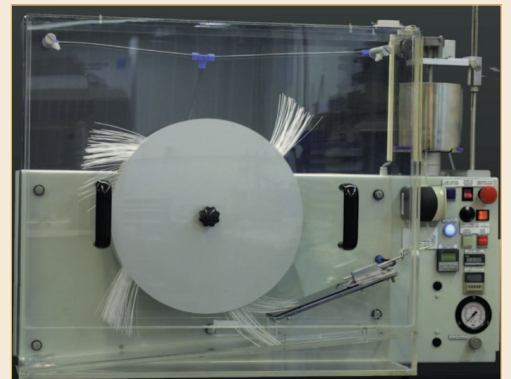
- *Corrosive resistant material:* Only plexiglas, anodised aluminium and stainless steel are used for the construction of the test chamber.
- *Easy access to all parts:* The front window can be removed which gives easy access to the test panel holder, the brush and the inside of the test chamber for cleaning.
- *Front window removal protection:* Removal of the front window from the apparatus stops the brush rotation automatically.
- *Inclined bottom:* Allows quick removal of the used detergent.
- *Stirring paddles positioning system:* The detergent/alumina mixture is stirred by paddles at 100rpm (adjustable). The height of the paddles can be changed.
- *Cleaning system:* Two sprinklers are positioned at the top of the chamber to spray demineralised water to clean the brush and the inside of the test chamber.
- *Downwards-directed abrasive solution flow:* At each point of its path the abrasive solution flow is directed downwards, preventing the alumina from settling.
- *The brush fibres adapter:* A holder for the bundles of fibres. Preparing the brushes is as easy as 1, 2, 3. There are three basic actions: bundling the fibres, inserting the bundle into the adapter, cutting the fibres to length. By using this adapter a lot of time is saved.
- *Adaptable:* The brush filaments can be replaced by other types of material for simulating various washing techniques.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1730	Elcometer 1730 Car Wash Simulator	K0UK1730M002	K0001730M002	K0US1730M002
Accessories	Slide Support for fibres	KT001730P307A		
	Calibrated tube for the cutting of the fibres	KT001730P601A		
	Fibre fixing collar	KT001730P602		
	Bunch of PSA Fibres ~ 3000 fibres/bunch (length 900mm/35.4")	KT001730P016		

Elcometer 1720 Abrasion, Scrubbing & Washability Tester

This robust, reliable and extremely flexible machine has been designed for testing the washability, brushability and abrasion resistance of a wide range of materials, including; paint, lacquers, inks, coatings, leather, wood, plastics, printed material, fabrics, etc.

The Elcometer 1720 is available in two versions:

- 2 working stations – undertakes two tests at the same time.
- 4 working stations (as shown in picture) – allows the operator to test up to 4 samples, or 4 different tests at the same time, dramatically increasing your productivity.

A kit is also available – allowing you to upgrade your 2 working station model to a 4 working station model.

Simple to use and adaptable, the Elcometer 1720 has a large amount of functionality built in, including:

- *Double Counter* - Double function and independent displays make it easy to repeat and follow test sequences:
  - pre-selection count function – set the number of cycles desired per sequence and leave the machine to automatically stop.
  - total count function – indicates the total number of cycles after one or several sequences.
- *Variable Speeds* – with two interchangeable operating modes, the machine's performance can be optimised according to the type of tests:
  - fixed speed mode – 37 cycles per minute (ASTM, DIN, ISO and EN test methods).
  - variable speed mode – the operator can select a speed from 15 to 65 cycles per minute. (1 cycle = 1 motion back and forth of the carriage).
- *Carriage* – the carriage is designed with multiple functionality:
  - adjustable stroke length – user defined stroke length from 30 to 290mm (1.2 to 11.4″).
  - test tool locator – the brushes or abrasive pads are located in the chambers and are guided without superfluous devices or mechanisms, making it easy to install or remove alternative test tools.
- *Individual Dosers* – using this device the flow of test liquids can be regulated for each test location, independently.
- *Rapid Specimen Fastening System* – aluminium frames are held in place by quick release clamps. Each frame is fitted with a gasket which both enclose and divide the test specimen – allowing effective and comparative tests to be carried out simultaneously.
- *Chassis* – made from thick anodised aluminium, the Elcometer 1720 is both self supporting and robust, giving complete confidence in the durability of the machine, no matter how long the test period.

The Elcometer 1720 is equipped with either 2 or 4 working stations, each path separated by a water-tight gasket frame. This design enables up to 2 or 4 simultaneous comparative tests to be carried out. Dimensions are adapted so that 2 strokes of different products can be positioned onto a same specimen, e.g. PVC Leneta test panel. As a result a substantial economy of consumables can be achieved. For this purpose, the optional Elcometer 3508/1 2 Chamber Film Applicator facilitates the sample preparation - see page 31.
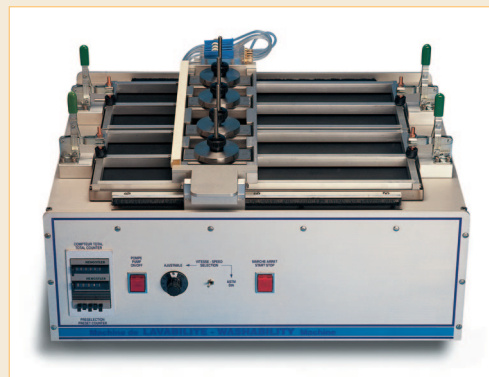
Can be used in accordance with:	
ASTM D 4213-96	ASTM F 1319
ASTM D 4213-92	ASTM D 4828
ASTM D 3450	ASTM D 2486
DIN 53778; ISO 11998	ISO 105X12
EN 60730	Renault/PSA D45 1010

Equipment Included in the Elcometer 1720	Quantity Supplied	
	2 station model	4 station model
Peristaltic pump of test solution	1	1
Individual flow doser	2	4
Brush, sponge or abrasive pad with holder	2 from a choice of tool numbers 1-6	4 from a choice of tool numbers 1-6
Stainless steel solution reservoir with drain	1	1
Aluminium frame with gasket and fastening – dividing the panel into 2 stations	1	2
Quick release clamps	2	4
Shim 250µm (9.8mils) thick, 12.7mm (0.5″) wide	1	2
Pre-selection counter for automatic stop	1	1

The Elcometer 1720 can undertake tests according to a wide range of different standards or test methods, by simply changing the abrasive tools.

Tool 1: DIN 53778 *(replaced by EN ISO DIN 11998 in Dec 2001)*
Wild boar hair brush and stainless steel brush holder, standardised mass: 250g (8.8oz).

Tool 2: ASTM D2486
Nylon bristle brush and stainless steel brush holder, standardised mass: 454g (16oz).

Tool 3: ASTM D4213-92/D4828
Sponge and stainless steel brush holder, standardised mass: 500g (17.6oz).

Tool 4: ASTM D3450
Sponge and stainless steel brush holder, standardised mass: 750g (26.5oz).

Tool 5: ASTM 4213-96
Sponge and stainless steel brush holder, adapted mass: 232g (8.2oz) and sponge (with 2 integrated abrasive pads – one on each side).

Tool 6: EN ISO DIN 11998
Aluminium holder, standardised mass: 135g (4.8oz) and abrasive pad.

Tool 7: Polyvalent Holder
Stainless Steel holder, fitted with a fastening screw to fix

abrasive textile or paper, and other similar materials as well. mass: 454g (16oz).

Tool 8: Renault D45 1010, ISO 105X12, ASTM F1319
Also known as the "Crockmeter", specially designed for testing colour fastness of fabrics. Assembly including adapter, removable stainless steel cylindrical rod (200g/7.0oz), test felt or textile fixing ring and a set of additional weights: 3 x 100g (3.5oz); 1 x 500g (16.6oz).

Tool 9: GME 60269
Tool for testing the resistance to abrasion of automotive components – similar to the "Crockmeter" but holding a felt disc of 10mm (0.4") diameter and 10mm (0.4") thick, working under a mass of 400g (14.1oz).

Tool 10: EN 60730 (resistance to markings)
Assembly for testing the quality of markings or similar coatings. A felt rubs the test surface over a length of 30mm (1.2"), under standardised time, speed and load conditions. The assembly is screwed into the carriage. Comes complete with a height adjustable arm fastening the felt disc, a rod for holding the weights, and a combination of weights allowing the test load to be varied between 150-1700g (5.3-60oz) in 50g (1.8oz) steps.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1720/3	Abrasion / Scrub and Washabilty Tester - 2 station	K0UK1720M003	K0001720M003	K0US1720M003
Elcometer 1720/4	Abrasion / Scrub and Washabilty Tester - 4 station	K0UK1720M004	K0001720M004	K0US1720M004
Accessories	Washability Upgrade Kit of 2 stations (1720/3 model only)		KT001720N001	
	Tool No 1: DIN 53778 – Wild Boar Brush & Holder		KT001720P003	
	Tool No 2: ASTM D2486 - Nylon Brush, Holder & Mass		KT001720P030	
	Tool No 3: ASTM D 4213-92/4828 – Sponge, Holder & Mass		KT001720P005	
	Tool No 4: ASTM D3450 – Sponge, Holder & Mass		KT001720P073	
	Tool No 5: ASTM D4213-96 – Sponge/Abrasive, Holder & Integrated Mass		KT001720P029	
	Tool No 6: ISO 11998 – 5 x Abrasive Pads & Holder		KT001720P036	
	Tool No 7: Polyvalent Holder with fastening screw		KT001720P207	
	Tool No 8: "Crockmeter" Renault D45 1010, ISO 105X12, ASTM F1319		KT001720P074	
	Tool No 9: GME 60269 – Abrasion for automotive components kit		KT001720P075	
	Tool No 10: EN 60730 Resistance to Markings Accessories kit		KT001720N003	
	Wild Boar Brush - DIN 53778		KT001720P004	
	5 x Sponges - ASTM D4213-92		KT001720P006	
	10 x Abrasive pad - ISO 11998		KT001720P037	
	Felt disks for EN60730 std device 2pcs		KT001720P062	
	Complete stainless steel pad with abrasive sheet		KT001720P007	
	Abrasive sheet 25m roll – for KT001720P007		KT001720P008	
	4 x Abrasive sheet - Grit 120 to rectify ASTM Brush		KT001720P051	
	Nylon Brush - ASTM D 2486		KT001720P009	
	Scrub medium SC2 abrasive type		KT001720N002	
	Self adhesive gasket for frame - 10m length		KT001720P013	
	Glass plates 6pcs - Face matt		KT001720P014	
	Check weight - 227g, ¹/₂lb		KT001720P031	
	Check weight - 500g, 17.6oz		KT001720P019	
	Leneta Scrub Test Panels		(see page 38)	

Elcometer 1720/5 Spongeability & Washability Tester

This version of the Elcometer 1720 is adapted for the spongeability and washability of wall coverings (papers), in accordance with the EN 233 Standard.

The test consists of scrubbing the sample with a tool under defined conditions.

The Elcometer 1720 EN 233 is identical to the Elcometer 1720 Abrasion, Scrubbing and Washability Tester, with the exception of the following:

- Variable Speed Mode – the operator can select a speed from 30 to 120 cycles per minute. (1 cycle = 1 motion back and forth of the carriage).

- Special Accessory (abrasive tool not included).

- 1 or 2 specimen fastening frames are supplied, for the 2 station and 4 station models respectively, instead of the standard aluminium frame, with double room of 290 x 140mm (11.4 x 5.5").

The fixed speed mode of 37 cycles per minute and the variable stroke length remain the same as in the Elcometer 1720 Abrasion, Scrubbing and Washability Tester, the Elcometer 1720 EN 233 can also perform in accordance with ASTM, DIN, ISO, EN tests.

All abrasive tools listed for the Elcometer 1720 Abrasion, Scrubbing and Washability Tester can be used, see page 43 for part numbers.
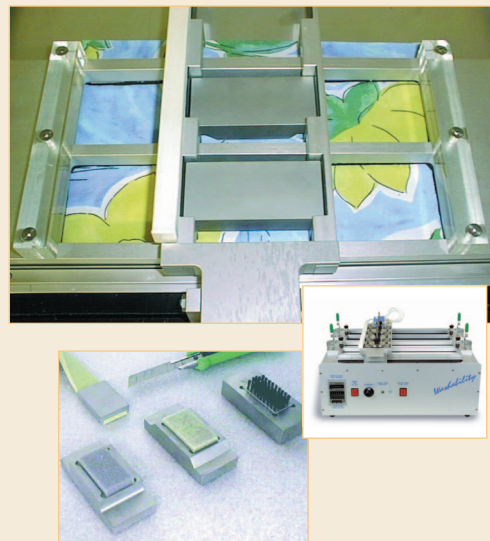
Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1720/5	EN233 Spongeability and Washability Tester - 2 Station	K0UK1720M005	K0001720M005	K0US1720M005
Elcometer 1720/6	EN233 Spongeability and Washability Tester - 4 Station	K0UK1720M006	K0001720M006	K0US1720M006
Accessories	EN233/C3.2 - A sponge - aluminium support - 100g	KT001720N006		
	EN233/C3.2 - B stainless steel - felt support - 550g	KT001720N007		
	EN233/C3.2 - C brush - stainless steel support - 600g	KT001720N008		
	Sponge Only (2m roll/6.5')	KT001720P067		
	Felt Only (2m roll/6.5')	KT001720P068		
	Brush Only	KT001720P069		

Taber® 5700 Linear Abraser

Whatever your product, be it curved, round, big or small, the new Linear Abraser from Taber® can test it. Using a free floating head to follow the contours of the sample, the Taber® 5700 is the ideal abrasion tester.

Abrasion media, length of stroke, load and speed of stroke can all be user defined to meet your particular requirement.

The Linear Abraser abrades with a Wearaser™. 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.

Choose from a wide selection of abrasion Wearasers™ to simulate real-life wear conditions. See page 46 for Wearaser™ part numbers.

Each Taber® 5700 Linear Abraser includes:

Auxiliary weight - 500g load	Wearaser™ CS-10 (pack of 10)	Wearaser™ H-18 (pack of 5)
Wearaser™ depth gauge tool	Refacing strips (pack of 50)	Power cords
Fuses	Hex L - key tool	Hand brush (S-12)
Instruction manual	Refacing discs, 100pcs (S-11)	

Model	Description	Part Number
Elcometer 5700	Linear Abraser (110/230V, 60/50Hz)	ST985700
Accessories	Abrading Wearasers™	(see page 46)

Taber® 5130 & 5150 Rotary Abraser

The Taber® Abraser is an industry standard used in the wear and durability testing of ceramics, plastics, textiles, metals, leather, rubber and painted, lacquered and electroplated surfaces.

Accelerated wear test procedures using the Taber® Abraser have 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 available with either a single test head or dual testing heads, which allow the user to test two different or identical materials simultaneously, for comparison and contrast - doubling the productivity of the operator. A linear abraser is also available - the Taber® 5700 for testing small and curved items – see page 44.

Choose from a wide variety of abrading wheels and abraser accessories to simulate real-life wear conditions – see page 46 for our complete range.

Each Taber® Abraser includes:

Auxiliary weight - 500g load	Auxiliary weight - 1000g load
Specimen holder, 43" OD (E-100-125)	Hold down ring (E-100-101)
Hex wrench	Refacing discs, 100pcs (S-11)
Specimen plates, 4" square, 10pcs (S-16)	Hand brush (S-12)
Calibrase® wheel set (CS-10)	Calibrade® wheel set (H-18)
Vacuum unit with suction hose and round brush	Instruction manual
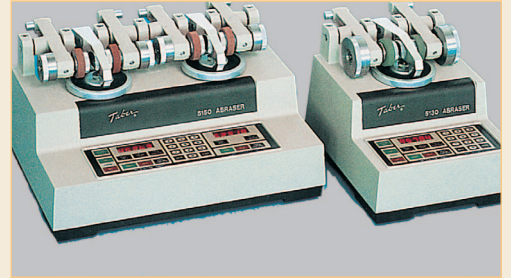
Can be used in accordance with:	
ASTM	C 217; C 241; C 501; C 1353; D 1044; D 3389; D 3884; D 4060; D 4158; D 5342; D 5650; F 362; F 510; F 1478
DIN	52347; 53109; 53754; 53799; 68861 T2
EN	438-2
FEDERAL	TT-C-542; TT-E-487A; TT-P-85C; TT-P-87B; TT-P-91B; TT-P-95A; TT-P-141B
FTMS	CCC-T-191 (Methods 5306 & 5309); GG-P-455B
ISO	5470; 9352
ISO/DIS	3537; 4586-2; 7784-2
JIS	A1453; K7204; L-P-406(Method 1091); P8125
MILITARY	MIL-A-8625; MIL-C-13495A; MIL-I-43553A; MIL-M-13231C; MIL-P-18493; MIL-T-28800C
NF	B51-282
SAE	J365; J948; J1530
SIS	923509
TAPPI	T476; T489; T566

Model	Description	Part Number
Elcometer 5130	Single Head Abraser Set (115V, 60Hz)	ST985130-5
Elcometer 5131	Single Head Abraser Set (230V, 50Hz)	ST985131-1
Elcometer 5150	Dual Head Abraser Set (115V, 60Hz)	ST985150-5
Elcometer 5151	Dual Head Abraser Set (230V, 50Hz)	ST985151-1
Accessories	Sample Cutter - cuts your sample to the exact shape for the rotary abraser	ST985000

A Grit Feeder Attachment and a range of other accessories for the Taber® Abrasers are available. Please contact Elcometer for further information.

Taber® Abrading Wheels & Wearasers™

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 the abrasiveness of materials such as dental powders. Wheels which feature abrasive particles in a resilient matrix of rubber or a hard matrix of vitrified clay are suitable for stiffer materials.

- *Calibrase®* - a resilient wheel composed of rubber and aluminium oxide abrasive particles.
- *Calibrade®* - a non-resilient wheel composed of vitrified clay and silicon carbide abrasive particles.
- *Wool Felt* - contains no abrasive particles.
- *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 or floor coverings.

Model	Type	Composition	Abrasive Action	Part Number	
				Rotary Abraser Wheel Set	Linear Abraser Wearaser™
CS-10F	Resilient	Rubber and Abrasive Grain	Very Mild	ST125321	ST130684
CS-10	Resilient	Rubber and Abrasive Grain	Mild	ST125320	ST130685
CS-17	Resilient	Rubber and Abrasive Grain	Harsh	ST125322	ST130686
H-10	Non-Resilient	Vitrified Clay	Coarse	ST125323	-
H-18	Non-Resilient	Vitrified Clay	Medium, Coarse	ST125324	ST130681
H-22	Non-Resilient	Vitrified Clay	Very Coarse	ST125325	ST130682
H-38	Non-Resilient	Vitrified Clay	Very Fine, Hard	ST125326	-
CS-0, S-32	Resilient	Non-Abrasive Rubber	Very Mild	ST125344	-
S-42, S-33	Resilient	Sand Paper Strips	Medium	ST125564	-
CS-5	Resilient	Wool Felt	None	ST125319	-
S-35	Non-Resilient	Tungsten Carbide	Severe Cutting or Tearing Action	ST125345	-

Elcometer 1700 Falling Sand Tester

Standardized sand placed in the reservoir is released and guided by the tube onto the test specimen, positioned at a 45° angle and at a distance of 25mm from the lower aperture of the tube.

The volume of sand required to obtain total erosion of the coating of a known thickness in an area of approximately 4mm (0.16") diameter indicates the abrasion resistance.

Can be used in accordance with:	
ASTM D 968	DIN 1164
FTMS 141b M6191	NFJ 17-093

Model	Description	Part Number
Elcometer 1700	Elcometer 1700 Falling Sand Tester	K0001700M001
Accessories	Ottawa ASTM Standardized Sand - 23kg (50.7lb)	KT001700N001
	CEN DIN EN 196-1 Standardized Sand - 50kg (110lb)	KT001700N002
	Artificial Corundum - NF Standard Bag of 5kg (11lb)	KT001700N003
	Glass Tube for Falling Sand Tester	KT001700P001

Hardness Testers

Improved mechanical resistance is part of many quality requirements. One important criteria for assessing this feature is hardness.

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.

Elcometer manufacture and supply a wide range of instrumentation designed for the hardness tests most frequently used in the industry – these include pendulum, scratching, indentation or rebound measuring methods.

Elcometer 3080 Pencil Hardness Tests & Hardness Pencils

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

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

The Elcometer 3080 Pencil Hardness Tests are supplied complete with stand and a series of 14 pencils, ranging from 6B to 6H hardness values.

Can be used in accordance with:
ASTM D3363
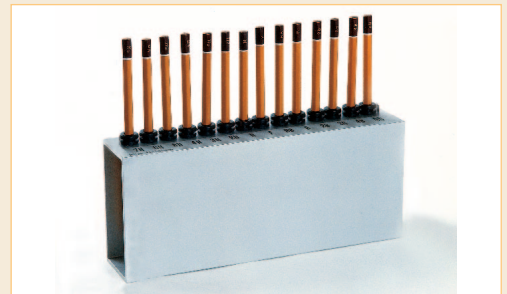
Model	Description	Part Number
Elcometer 3080/3	Elcometer 3080 6B to 6H Pencil Hardness Test with Stand	K0003080M003
Accessories	Pencil Sharpener	KT003080P018
	Set of Pencils (6B-6H)	T50115771

Hardness Pencils - 12 pencils in each box – see below

Description	Part Number	Description	Part Number
Hardness Pencils 6B	KT003080P001	Hardness Pencils F	KT003080P008
Hardness Pencils 5B	KT003080P002	Hardness Pencils H	KT003080P009
Hardness Pencils 4B	KT003080P003	Hardness Pencils 2H	KT003080P010
Hardness Pencils 3B	KT003080P004	Hardness Pencils 3H	KT003080P011
Hardness Pencils 2B	KT003080P005	Hardness Pencils 4H	KT003080P012
Hardness Pencils B	KT003080P006	Hardness Pencils 5H	KT003080P013
Hardness Pencils HB	KT003080P007	Hardness Pencils 6H	KT003080P014

elcometer®

Elcometer 501 Pencil Hardness Tester

Using the same technique of evaluation with pencils as the Elcometer 3080, this instrument enables the pencil lead to be maintained at a constant force of 7.5N, and at the appropriate angle - which increases the reproducibility of the test.

The Elcometer 501 is supplied in a plastic carrying case and comes complete with a set of pencils in each of the 14 hardnesses from 6B to 6H, a pencil sharpener and a sandpaper block.

Can be used in accordance with:	
ASTM D 3363	ECCA T4
EN 4.45.1	

Model	Description	Part Number
Elcometer 501	Elcometer 501 Pencil Hardness Tester	H501----1
Accessories	Set of Pencils (6B – 6H)	T50115771
	Spare Pencils – individual hardness value	(see page 47)

Elcometer 3086 Motorised Pencil Hardness Tester

Similar to the Elcometer 501 and using the same pencil technique, this motorised device in anodised aluminium can travel forwards (chip method) or backwards (indentation method) at a uniform speed - further increasing the reproducibility of the test.

The load on the lead is adjustable from 0 to 10N and each instrument is supplied with a lead holder and a set of 6 leads in each of the 14 hardnesses.

Can be used in accordance with:
ASTM D 3363

Model	Description	Part Number
Elcometer 3086/1	Elcometer 3086 Motorised Pencil Hardness Tester 220V	K0003086M001
Elcometer 3086/2	Elcometer 3086 Motorised Pencil Hardness Tester 110V	K0003086M002
Accessories	Spare Lead Holder	KT003084P020

Hardness Leads - See below			
Description	Part Number	Description	Part Number
Hardness Leads 6B	KT003084P001	Hardness Leads F	KT003084P008
Hardness Leads 5B	KT003084P002	Hardness Leads H	KT003084P009
Hardness Leads 4B	KT003084P003	Hardness Leads 2H	KT003084P010
Hardness Leads 3B	KT003084P004	Hardness Leads 3H	KT003084P011
Hardness Leads 2B	KT003084P005	Hardness Leads 4H	KT003084P012
Hardness Leads B	KT003084P006	Hardness Leads 5H	KT003084P013
Hardness Leads HB	KT003084P007	Hardness Leads 6H	KT003084P014

Elcometer 3092 Sclerometer Hardness Tester

The body of the instrument contains a round tip, compressed by one of the three springs corresponding to the three printed scales: 0-300, 0-1000, 0-2000g, and a cursor fitted with a screw lock.

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 0.75mm diameter tungsten carbide tip and 3 springs.

Model	Description	Part Number
Elcometer 3092	Elcometer 3092 Sclerometer Hardness Tester - 3 Ranges	K0003092M201
Accessories	Tool with Point 0.50mm in Metal Carbide	KT003092P001
	Tool with Point 0.75mm in Metal Carbide	KT003092P002
	Tool with Point 1.00mm in Metal Carbide	KT003092P003
	Tool with 90° Diamond Point for Glass Industry – ISO	KT003092P008
	Spring - Range 0-300g	KT003092P004
	Spring - Range 0-1000g	KT003092P005
	Spring - Range 0-2000g	KT003092P006
	Spring - Range 0-3000g	KT003092P007

Elcometer 3000 Clemen Unit

Designed to evaluate resistance to scratching. A tool fitted with a hemispherical ball of 1mm diameter (standard) is lowered gradually onto the surface of the sample and moved 6cm.

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

The Elcometer 3000 is available in two versions; the original Manual Clemen Unit and the Motorised Clemen Unit. See also the Elcometer 1535 Multifunction Scratching Tool on page 51.

Elcometer 3000/1 Manual Clemen Unit: The tool is positioned on the sample, which is fixed on a sliding platform and moved manually. Load variable from 0 to 2000g.

Elcometer 3000/3 Motorised Clemen Unit: The motorised motion brings the tool gently in contact with the sample, whatever the load, variable from 0 to 5000g, and moves it across the coating, with automatic start and stop. The contact of the tool with the metallic substrate is indicated by a lamp and voltmeter.
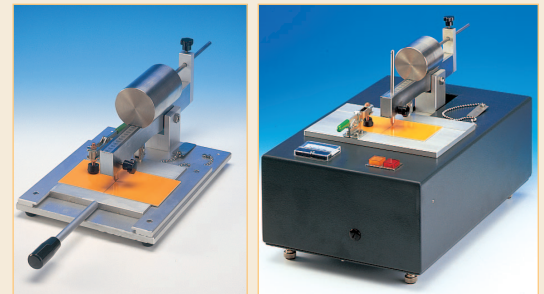
Can be used in accordance with:	
BS 3900 E2	BS 3900 E5
ISO 1518	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 3000/1	Elcometer 3000 Manual Clemen Unit		K0003000M001	
Elcometer 3000/3	Elcometer 3000 Motorised Electric Clemen Unit	K0UK3000M003	K0003000M003	K0US3000M003
	Options for the Elcometer 3000/3 – to be requested when ordering			
	Adjustment Kit to test from 5 to 20mm		KT003000N015	
	Luminous microscope - x30		KT007210M001	
	Magnifier – x10		KT001546N002	
Accessories	1mm Ball Tool in Tungsten Carbide		KT003000P021	
	2mm Cutting Tool in Tungsten Carbide		KT003000N001	
	VW Cutting Tool		KT003000N013	
	1cm² Rubber Tool for Drying Time		KT003000N002	

Elcometer 3030 & 3040 Persoz & König Pendulum Hardness Testers

These instruments work on the principle that the damping time of a pendulum oscillating on a sample indicates the hardness. The amplitude of the oscillation reduces faster when the sample is soft.

The Persoz and König methods differ by the dimension, period and amplitude of the oscillation.

- The Persoz test measures the time taken for the amplitude of oscillation to decrease from 12° to 4°.

- The König from 6° to 3°.

Hence the König will take approximately half the time to test the same sample as the Persoz.

Available in 3 models: Persoz, König, and Persoz and König combined.

Standard equipment includes:

- Hood to protect against draughts, fitted with a front door and a side opening to simplify sample handling.

- Practical system to facilitate sample tightening and loading of pendulum, with automatic release.

- Maximum sample dimensions: 200 x 110 x 15mm (7.85 x 4.33 x 0.6").

- Accurate, automatic counting by photoelectric cell.

- Digital display.
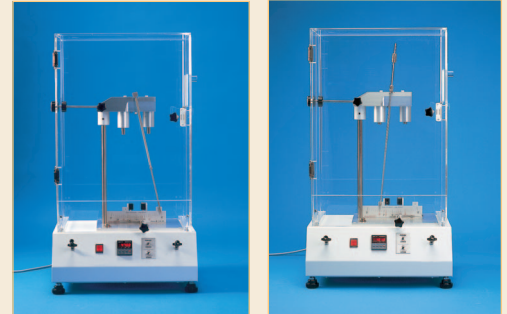
Can be used in accordance with:	
ASTM D 4366	BS 3900 E5
DIN 53157	ISO 1522
NBN T22-105	NF T 30 016

PERSOZ Method	Oscillation Period	1 second
Stainless steel pendulum, weight 500g,	Deflections	from 12° to 4°
fitted with 2 balls measuring 8mm diameter.	Damping Time on Glass	minimum 430 ± 10 second.
	Oscillation Period	1.4 seconds
KÖNIG Method	Deflections	6° to 3°
Stainless steel pendulum, weight 200g,	Damping Time on Glass	250 ± 4.2 seconds
fitted with 2 balls measuring 5mm diameter.	2 Counting Methods	oscillations or time.
	Number of Oscillations	179 ± 3.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 3030/1	Elcometer 3030 Persoz Pendulum Hardness Tester	K0UK3030M002	K0003030M002	K0US3030M002
Elcometer 3040/2	Elcometer 3040 König Pendulum Hardness Tester	K0UK3040M002	K0003040M002	K0US3040M002
Elcometer 3034	Elcometer 3034 Persoz and König Pendulum Hardness Tester	K0UK3034M001	K0003034M001	K0US3034M001
Accessories	König Pendulum	KT003040P001		
	Persoz Pendulum	KT003030P001		
	Glass Calibration Shim	KT003045P009		

Elcometer 1535 Multi Function Scratch Tester

During the development of a coating, to establish the most appropriate coating for a specific requirement, numerous tests need to be undertaken. Many can be done with the Elcometer 1535.

Designed to cut St. Andrew's crosses and parallel or perpendicular scratches, this pneumatic tester is designed to ensure reproducible scratching tests, often performed manually and inconsistently.

Steel specimens are held in place by a magnetic plate measuring 200 x 100mm (7.8 x 3.9"). This plate can be orientated as required and has an adjustable displacement from 10 to 180mm (0.4 to 7.0"). Upon request, this table can be fitted with channels linked to a vacuum pump for holding non-ferrous samples such as plastics and aluminium.

Combining sample position, table orientation, run length and the appropriate tool, parallel or crossed scratches of different dimensions are created. The Elcometer 1535 is adaptable to various applications simply by changing the tool and its specific holder. Tools can be quickly changed and the fixture ensures that they are perpendicular to the test sample.

Can be used in accordance with:	
ASTM D 3359	DIN EN ISO NF 2409
DIN 53167	DIN 53799
ISO 4586	

The Elcometer 1535 can undertake a combination of tests, including:
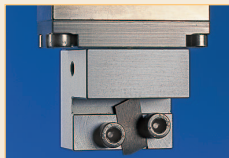
St Andrew's Cross Test
Holder and 1mm wide DIN cutter. A 0.5, 2 and 3mm cutter for preparation of corrosion samples and a special holder for making two scratches without moving the specimen are available.

Scratch Test
Holder and tool with diameters of 1mm, 0.75mm (VDA) and 0.5mm are available.

Cross Hatch Test
Holder and cross-cut test tool of 1, 2 or 3mm spacing.

Coin Test
Scratching support and tool for "resistance to coins tests".

Model	Description	Part Number
Elcometer 1535	Elcometer 1535 Multi Function Scratch Tester	K0001535M001
Accessories	Non Magnetic Substrate Vacuum Table	KT001535N007
	Holder for Cross Cut Tool	KT001535N004
	6 x 1mm cross cut tool - 8 blades	KT001542P001
	6 x 2mm cross cut tool - 8 blades	KT001542P002
	6 x 3mm cross cut tool - 8 blades	KT001542P003
	Magnifier x10	KT003025P007
	ASTM Normalised Adhesive - 1 roll	K0001539M001
	ISO Normalised Adhesive	K0001539M002
	VOLVO STD 1029,5472 Adhesive	K0001539M006
	DIN Normalised Brush	KT001546N001
	Holder for Carbide Points (points not included)	KT001535N003
	Carbide Point - 0.5mm	KT003092P001
	Carbide Point - 0.75mm	KT003092P002
	Carbide Point - 1.00mm	KT003092P003
	Holder for Coin Test Tool - 10 Discs	KT001535N005
	Coil Scratch Discs - 100 Discs	KT001535N008
	Tungsten Carbide Negative Cutter - 2 cutting edges -1mm	KT001535N001
	Tungsten Carbide Negative Cutter - 2 cutting edges - 0.5mm	KT001535N002
	Tungsten Carbide Normal Cutter - 2 cutting edges - 1mm	KT001538N001
	Tungsten Carbide Normal Cutter - 2 cutting edges - 0.5mm	KT001538N002
	Tungsten Carbide Positive Cutter - 2 cutting edges - 1mm	KT001535N009
	Tungsten Carbide Positive Cutter - 2 cutting edges - 0.5mm	KT001535N010
	Device for Clemen test	KT001535N006

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Elcometer 3025 Scratch/Shear Tester

A motorised device to test the resistance of many materials to scratching (ISO).

The tool, a conical diamond tip, is fixed beneath a beam graduated from 0 to 1000g (0 to 2.2lb) holding a sliding weight.

This tip is applied to a sample rotating at 5rpm. The tip leaves a trace and the extent of this, in relation to the load used, indicates the degree of hardness.
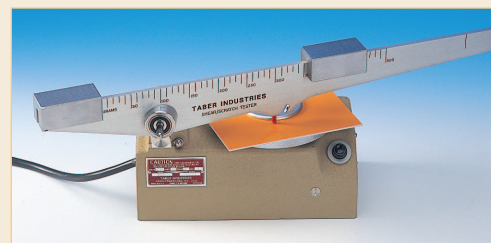
Can be used in accordance with:
ISO 4586-2

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 3025	Elcometer 3025 Scratch/Shear Tester	K0UK3025M001	K0003025M001	K0US3025M001
Accessories	Magnifier x10	KT003025P007		

Elcometer 3095 Buchholz Hardness Tester

Unit for measuring hardness by the indentation of a bevelled disc indenting tool with a sharp edge. This is fitted onto a steel block with two supports providing a constant test load of 500g. When placed on a coating for 30 seconds, the disc leaves a trace that can be observed with the x20 microscope, with graduations every 0.1mm. The indentation length is then recorded. This length of the trace is inversely proportional to the hardness.

Supplied with an indentation locator template, and illuminated microscope.

Can be used in accordance with:	
BS 3900 E9	DIN 53153
ECCA T12	EN ISO NF 2815
NF T 30-052	

Model	Description	Part Number
Elcometer 3095	Buchholz Hardness Tester	K0003095M001
Accessories	Spare Pin Supports (2)	KT003095P001
	Bevelled Hardened Steel Disc	KT003095P002

Elcometer 3101 Barcol Hardness Tester

This is a very handy instrument used to check the hardness of many materials including plastics, polyesters, leather and soft metals.

When pressure is applied to the device, a point penetrates the material and the degree of hardness is displayed on a dial, which is graduated from 0 to 100.

Three versions of the Elcometer 3101 are available.

Can be used in accordance with:	
ASTM B 648	ASTM D 2583
NF P 38-501	

Model	Type	Substrate
Elcometer 3101/1	934/1	Soft metals, hard plastics etc., with conversion table into Brinell, Vickers, and Rockwell B, E, F, H
Elcometer 3101/2	935	Plastics and very soft materials
Elcometer 3101/3	936	Extremely soft materials and fabrics, e.g. leather.

Model	Description	Part Number
Elcometer 3101/1	Elcometer 3101 Barcol Hardness Tester Type 934/1	K0003101M001
Elcometer 3101/2	Elcometer 3101 Barcol Hardness Tester Type 935	K0003101M002
Elcometer 3101/3	Elcometer 3101 Barcol Hardness Tester Type 936	K0003101M003
Accessories	Spare Indenter Point 934-1 935 GYZJ 6-5	KT003101P001
	Control Disc for 934-1 GYZJ 24 (85-87)	KT003101P002
	Control Disc for 934-1 GYZJ 24 (48-43)	KT003101P003

Elcometer 3120 Shore Durometer

Instruments widely used to test soft materials: rubber, various resins, wood, leather, formica etc.

A point or a ball penetrates the material under spring pressure, with variable force depending on the model. A direct reading is displayed on the dial which is graduated from 0 to 100 Shore Hardness Units.

All the instruments can be used hand held or on a stand (optional). The stand is designed to carry the load of 12.5 N of Shore A, or an additional load to obtain the 50 N used in the Shore D.

Options:

- Maximum reading needle.
- Stand with contact lever, useful for repetitive tests or tests on small samples.
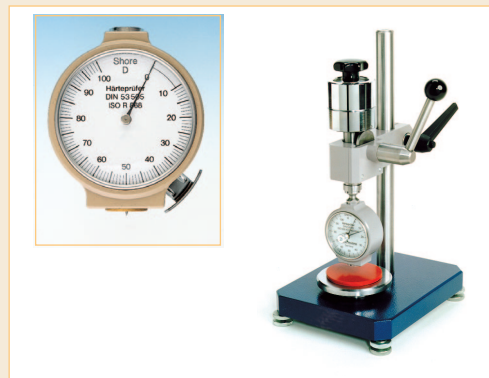
Can be used in accordance with:	
ASTM D 2240	DIN 53505
ISO 868	NF T 51109

Available in a wide range of versions, each one designed for a different type of hardness – as shown below:

```
    ←—— Soft          Medium          Hard ——→

         Shore A DIN 53505 and NFT 51109
              Shore B ASTM D2240
                 Shore C ASTM D2240
                    Shore D DIN 53505 and NFT 51109
               Shore DO ASTM D2240
            Shore O ASTM D2240
         Shore OO ASTM D2240
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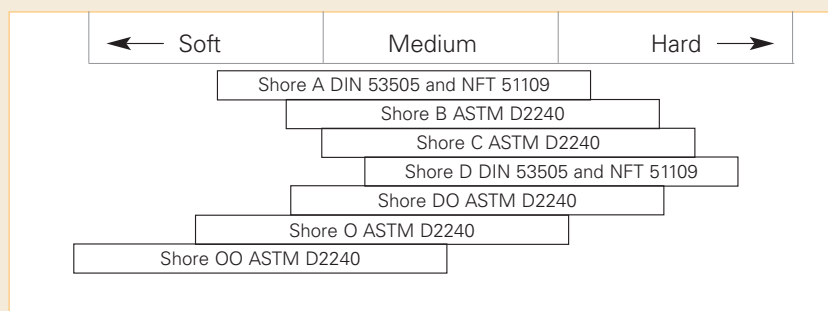
Model	Description	Part Number Without calibration certificate	Part Number With calibration certificate
Elcometer 3120/1	Elcometer 3120 Shore Durometer A	K0003120M001	K0003120M015
Elcometer 3120/3	Elcometer 3120 Shore Durometer B	K0003120M003	K0003120M016
Elcometer 3120/4	Elcometer 3120 Shore Durometer C	K0003120M004	K0003120M017
Elcometer 3120/5	Elcometer 3120 Shore Durometer D	K0003120M005	K0003120M018
Elcometer 3120/6	Elcometer 3120 Shore Durometer O	K0003120M006	K0003120M019
Elcometer 3120/7	Elcometer 3120 Shore Durometer OO	K0003120M007	K0003120M020
Elcometer 3120/10	Elcometer 3120 Shore Durometer DO	K0003120M010	-
Elcometer 3120/24	Elcometer 3120 Shore Durometer OOO and 400g	K0003120M024	-
Elcometer 3120/8	Elcometer 3120 Shore Durometer A with Max indicator	K0003120M008	-
Elcometer 3120/25	Elcometer 3120 Shore Durometer A and 12.5N Weight with Max indicator	-	K0003120M025
Elcometer 3120/9	Elcometer 3120 Shore Durometer D with Max indicator	K0003120M009	-
Elcometer 3120/204	Elcometer 3120 Shore Durometer B with max indicator	K0003120M204	-
Elcometer 3120/205	Elcometer 3120 Shore Durometer C with max indicator	K0003120M205	-
Elcometer 3120/207	Elcometer 3120 Shore Durometer O with max indicator	K0003120M207	-
Elcometer 3120/208	Elcometer 3120 Shore Durometer DO with max indicator	K0003120M208	-
Elcometer 3120/221	Elcometer 3120 Shore Durometer OO and 400g weight	K0003120M221	-
Accessories	Test stand BS61 and 400g load Shore OO and OOO	KT003120N203	
	Test stand BS61 and 12.5N load Shore A	KT003120N002	
	50N load Shore D for stand BS61	KT003120P005	

Elcometer 3129 Equotip Durometer

A portable durometer for metals, using the principle of measurement of the speed and rebound of an impact body, which is launched by a spring and guided by an instrument on the part to be examined.

The results can be automatically converted into Rockwell B and C, Vickers, Brinell and Shore units on the LCD.

Three Models Available:

- UNIT D: Includes impact device D, with 1.5m cable, electronic indicator device with RS232C interface, test block D, coupling paste, cleaning brush, battery pack with six 1.5V batteries, connection for external DC power supply, carrying case.

- UNIT E: Includes impact device E with diamond test strip for an extremely long life. Recommended where the predominant hardness values to be measured are in excess of 50HRC, 650HV or for extra hard components up to 1200HV.

- UNIT G: This version is recommended for the exclusive measurement of solid and heavy components in the Brinell range. Unit G has minimal disturbance of the surface finish.

Features Include:

- Memory for 5000 values.
- RS232 output for printer or PC.
- Clear LCD which displays.
- Instrument and direction of impact.
- Measurement results.
- Graph of consecutive measurements.
- Statistics (mean, min., max., standard deviation).
- Conversion unit.
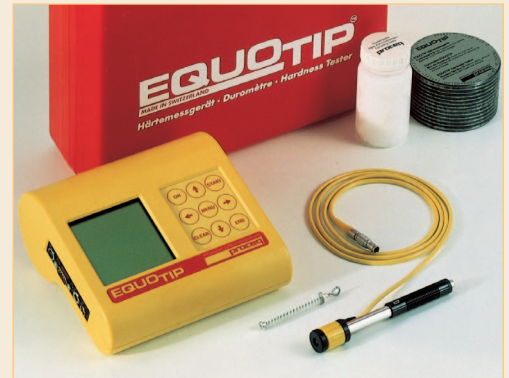
Model	Description	Maximum Hardness of Sample	Part Number
Elcometer 3129/1	Elcometer 3129 Equotip Durometer - Basic Unit D	940 HV Vickers	K0003129M001
Elcometer 3129/2	Elcometer 3129 Equotip Durometer - Basic Unit G	650 HV Vickers	K0003129M002
Elcometer 3129/3	Elcometer 3129 Equotip Durometer - Basic Unit E	1200 HV Vickers	K0003129M004
Accessories	Impact Devices for Equotip - DL	950 HV Vickers	KT003129N001
	Impact Devices for Equotip - DC, including loading stick	940 HV Vickers	KT003129N002
	Impact Devices for Equotip - D	940 HV Vickers	KT003129N003
	Impact Devices for Equotip - C	1000 HV Vickers	KT003129N004
	Impact Devices for Equotip - E	1200 HV Vickers	KT003129N005
	Impact Devices for Equotip - D+15	940 HV Vickers	KT003129N006
	Impact Eevices for Equotip - G	650 HB Brinell	KT003129N007
	Standard Test Block D for Equotip		KT003129N008
	Standard Test Block G for Equotip		KT003129N009
	Standard Test Block D with MPA certificate		KT003129N010
	Standard Test Block G with MPA certificate		KT003129N011
	EQUO-LINK Software		KT003129N012
	Impact Device Cable - 1.5m (5')		KT003129P001
	Impact Device Cable - 5m (16.5')		KT003129P002
	Additional Impact Bodies D Suitable D/DC		KT003129P004
	Additional Impact Bodies C		KT003129P005
	Additional Impact Bodies E		KT003129P006
	Additional Impact Bodies D+15		KT003129P007
	Additional Impact Bodies G		KT003129P008
	Additional Impact Bodies DL		KT003129P009
	Coupling Paste (can)		KT003129P011
	Set of 12 Support Rings		KT003129P019
	Printer Connection Cable - 1.5m (5')		KT003129P020

The Elcometer 3129 can be adapted to work on curved surfaces. Please contact Elcometer for further information.

Elasticity & Resistance Deformation

Elasticity and resistance to deformation are part of the key physical properties required in the coatings industry today. Essentially there are three different test methods which are used to determine a coating's performance under different deformation conditions.

Bend Test   A coated metal sheet is bent over a cylindrical or conical mandrel and the coating observed for cracks and discolouration.

Impact Test   A coated metal sheet is placed beneath a falling weight and the resultant damage caused by the deformation is observed. The impact test method is used to identify how the coating performs under a rapid deformation process.

Cupping Test   A coated metal sheet is subjected to a gradual deformation by a polished die. This deformation is caused by the die being pushed from beneath the coating – i.e. from the reverse side of the sheet. The end-point is when the coating begins to crack.

Elcometer 1510 Conical Mandrel Bend Tester

Mechanical testing equipment for the determination of elasticity, adhesion and elongation of paint 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 to 1.5"). A graduation indicates the mandrel diameter in mm and inches.

This particularly robust and rigid construction provides excellent resistance to deformation and long service life. 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.

Can be used in accordance with:	
ASTM D 522	BS 3900 E11
DIN 53150	DIN ISO EN 6860
ECCA T7	

Model	Description	Part Number	
		Metric	Imperial
Elcometer 1510	Elcometer 1510 Conical Mandrel Bend Tester ISO/ASTM – metric	K0001510M001	K0US1510M001

Elcometer 1500 Cylindrical Mandrels on a Stand

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.

Painted 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.

Can be used in accordance with:	
ASTM D 522	BS 3900 E1
DIN 53152	ECCA T7

Model	Description	Unit of measurement	Part Number
Elcometer 1500/1	Set of 7 mandrels from $1/8$" to 1"	inches	K0US1500M001
Elcometer 1500/2	Set of 13 Cylindrical Mandrels on a Stand from 2mm to 32mm	mm	K0001500M002

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Elcometer 1506 Cylindrical Mandrel Bend Tester

A very robust mechanical unit for determining the elasticity, adhesion and elongation of dried paint on sheet metal.

The frame has a bending lever, with height adjustable rollers and a sliding vice for the sample. Thanks to its design, the instrument can be adapted to the diameter of the mandrel used.

The coated specimens, up to 70mm (2.75″) wide, and 80mm (3.15″) long (for a mandrel 2mm (0.08″ diameter) to 100mm (3.93″) (for a mandrel of 32mm (1.25″) diameter) are bent perfectly and regularly on decreasing mandrels until cracks can be observed.

Each instrument is supplied with a kit of 14 stainless steel mandrels with diameters of:

Metric Version   - 2, 3, 4, 5, 6, 8, 10, 12, 13, 16, 19, 20, 25 and 32mm.

Imperial Version - 0.08, 0.12, 0.16, 0.20, 0.24, 0.31, 0.39, 0.47, 0.51,
0.63, 0.75, 0.79, 0.98, 1.25 inches.

Can be used in accordance with:	
ASTM D 1737	BS 3900 E1
DIN 53152	DIN EN ISO NF 1519
ECCA T7	NF T 30-040

Model	Description	Part Number	
		Metric	Imperial
Elcometer 1506/1	Elcometer 1506 Cylindrical Mandrel Bend Tester ASTM-DIN-ISO	K0001506M001	K0US1506M001
Accessories	Elcometer 1506 Spare set of 14 Mandrels	KT001506P201	KTUS1506P201

Elcometer 1620 Cupping Tester

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

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

A motorised version is also available which replaces the manual crank handle. This ensures perfect reproducibility with constant cupping speed of 200µm per second (7.9mils per second).

The Elcometer 1620 is available with either an analogue or a digital gauge and both models are supplied with an illuminated magnifier to accurately view the deformation's results. A CCD video system can also be supplied as an accessory.

The Elcometer 1620 provides accurate (10µm/0.4mil) readings of the cupping depth on an integrated gauge and direct viewing of the fissures cracks and tears in the coating.

Can be used in accordance with:	
BS 3900 E4	DIN 53156
DIN EN ISO NF 1520	DIN 53232
NBN T22-104	NF T 30 019

Model	Description	Gauge Type	Part Number		
			UK 240V	EUR 220V	US 110V
Elcometer 1620/3	Elcometer 1620 Motorised Cupping Tester	Analogue (mm)	K0UK1620M003	K0001620M003	-
Elcometer 1620/3	Elcometer 1620 Motorised Cupping Tester	Analogue (mils)	-	-	K0US1620M003
Elcometer 1620/5	Elcometer 1620 Motorised Cupping Tester	Digital (mm, mils)	K0UK1620M005	K0001620M005	K0US1620M005
Elcometer 1620/2	Elcometer 1620 Manual Cupping Tester	Analogue (mm)	K0001620M002		
Elcometer 1620/2	Elcometer 1620 Manual Cupping Tester	Analogue (mils)	K0US1620M002		
Elcometer 1620/4	Elcometer 1620 Manual Cupping Tester	Digital (mm, mils)	K0001620M004		
Accessories	CCD Video (Colour) Viewing System		KTUK1620N004	KT001620N004	KTUS1620N004
	Illuminated Magnifying Glass		KT001620P004		

Elcometer 1615 Variable Impact Testers

For evaluating the resistance of a coating to impact (elongation, cracking or peeling). A weight with hemispherical ends falls on the coated side or reverse of a sheet metal specimen fixed onto a corresponding die.

Three models are available:

The Elcometer 1615/1 Heavy Duty Impact Tester comes complete with:

- A Heavy duty base and a graduated guide tube of 100cm (39″)
- A punch carrying anvil
- Adjustable collar device for setting the falling height
- A quick release clamping device for fast insertion and removal of the test specimen
- 1 x 15.90mm ($^5/_8$″) punch
- 1 x 16.3mm (0.64″) die
- 1 x weight of 1kg (2.2lb)
- 1 x weight of 2kg (4.4lb)

The Elcometer 1615/2 Variable Impact Tester comes complete with:

- A solid base and a graduated guide tube of 100cm (39″)
- Adjustable collar device for setting the falling height
- A quick release clamping device for fast insertion and removal of the test specimen
- 1 x 20mm (0.79″) punch
- 1 x 27mm (1.06″) die
- 1 x weight of 1kg (2.2lb)
- 1 x weight of 2kg (4.4lb)

The Elcometer 1615/3 Variable Impact Tester comes complete with all of the above but is fitted with a stepped rotated stop ring. This stop ring allows the penetration depth to be limited to:

Metric Version - 2, 3, 4, 5, 6, 7, 8, 9, 10 and 15mm
Imperial Version - 0.08, 0.12, 0.16, 0.20, 0.24, 0.28, 0.31, 0.35, 0.39, and 0.60 inches

The test specimen is fixed into position by the quick release clamp. The weight is lifted to the predetermined height, set by the adjustable collar device. The weight is then released and the resulting deformation is observed.

Accessory kits are available to allow tests to be in accordance with ASTM D 2794 and NF T30 017.

Can be used in accordance with:	
ASTM D 2794	BS 3900 E13
DIN EN ISO NF 6272	ECCA T5
NF T30-017	

Model	Description	Punch Diameter		Die Diameter		Part Number	
		mm	inch	mm	inch	Metric	Imperial
Elcometer 1615/1	Elcometer 1615 Heavy Duty Variable Impact Tester	15.9	0.625	16.3	0.640	K0001615M001	K0US1615M001
Elcometer 1615/2	Elcometer 1615 Variable Impact Tester	20	0.787	27	1.063	K0001615M002	K0US1615M002
Elcometer 1615/3	Elcometer 1615 Variable Impact Tester with stop ring	20	0.787	27	1.063	K0001615M003	K0US1615M003
Accessories	Kit No. 1 - ASTM Comprising of: Punch, Die, impact device for 2 weights, punch carrying anvil	15.9	0.625	16.3	0.640	KT001615N007	
	Kit No. 2 - ASTM Comprising of: Punch, Die, impact device for 2 weights, punch carrying anvil	12.7	0.5	16.3	0.640	KT001615N008	
	Kit No. 3 - NF Comprising of: Punch, Die and one weight of 400g	23	0.90	22	0.87	KT001615N204	
	Punch with Ball - ASTM	15.6	0.625	16.3	0.64	KT001615N002	
	Punch with Ball - ASTM	12.7	0.5	16	0.63	KT001615N003	
	Punch with Ball	23	0.90	22	0.87	KT001615N004	
	Punch Diameter	12.7	0.5	-	-	KT001615P006	

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Test Charts
see pages 33-38

Washability, Brushability & Abrasion Testers
see pages 41-46

Appearance

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

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

Gloss

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

Haze

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

Shade

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

Opacity

This is the degree to which a coating will obscure the surface to which it has been applied. Opacity is measured in a similar way to shade, however opacity, or hiding power, as defined by ISO 2814 involves measuring whiteness of a known film of test material on both a black (less than 5%) and a white (greater than 75%, less than 85%) substrate. A full range of opacity test charts are available – see pages 33-38 for further information.

Colour

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

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Elcometer 406 Novo-Gloss™ Mini Glossmeter

Gloss is measured by directing a constant power light beam at an angle to the test surface and monitoring the reflected light. Different surfaces require different reflective angles.

Elcometer glossmeters cover the range necessary to measure any surface from high gloss to matt, providing a quantitative value to gloss measurement.

Increasingly, specifications and standards require a physical assessment of gloss. Gloss measurement is necessary to monitor the uniformity, compatibility, or possibly the deterioration of any protective gloss finish. The Elcometer 406 Novo-Gloss™ Mini Glossmeter is available in 60° Statistical and Dual Angle 20/60° Statistical versions.

- Low cost
- Menu driven
- Automatic calibration – Preset tile value option, for quick calibration
- Unique, calibration tile condition warning
- Gloss readings over the entire range from non-reflective surfaces to mirror finish
- Continuous measurements for variable surfaces
- Calibration possible using any standard
- Full traceability to National Standards, including BAM
- Internal calculation of max, min, mean, standard deviation and coefficient of variation
- Can be switched between English, French, German, Italian, Spanish and Dutch languages by the user

Can be used in accordance with:	
AS 1580-602.2	ASTM D 523
ASTM D 1455	ASTM C 584
BS 3900-D5	BS 6161-12
DIN 67530	ECCA T2
ISO 2813	ISO 7668

Each instrument is supplied with a BAM Traceable Calibration Tile with Protective Case, Spare Light Source, CD with Novo-Soft™ Software, RS232 Interface Cable, Cleaning Cloth and Instrument Carrying Case.

ELCOMETER NOVO-SOFT™ SOFTWARE

This purpose designed software, in Windows format, provides the user with an easy to use package for reporting purposes, archiving gloss measurements and further analysis.
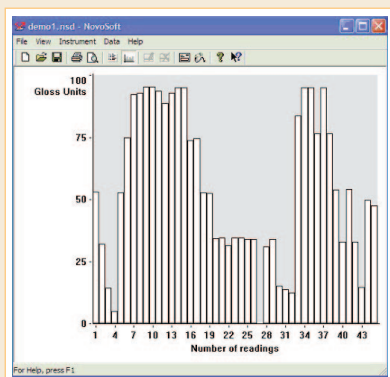
- Results page – numerical data is displayed and may be tagged or edited.
- Results graph – this enables display of all results in a simple graph of reading versus gloss.
- Statistics graph – data is displayed as a bar chart (histogram).

Accuracy	Reproducibility ±0.5 Gloss Units (GU)
Resolution	0.1GU
Dimensions	125 x 50 x 100mm (4.9 x 2.0 x 3.9")
Weight	350g (12.3oz)
Power Supply	Dry Cells

Model	Description	Part Number
Elcometer 406/2	Elcometer 406 Novo-Gloss™ Mini Glossmeter 60° Statistical	J406--60S
Elcometer 406/3	Elcometer 406 Novo-Gloss™ Mini Glossmeter Dual 20/60° Statistical	J406--2060S

Elcometer 401 & 402 Novo-Gloss™ Glossmeters

Increasingly, specifications and standards require an assessment of gloss. Gloss measurement is necessary to monitor the uniformity, compatibility, or possibly the deterioration of any protective gloss finish.

The Elcometer Novo-Gloss™ glossmeters are available in a Basic version – the Elcometer 401 – or a Statistics version – the Elcometer 402 – which has a memory of up to 999 readings and can be connected to the Elcometer Novo-Soft™ Software for further analysis and archiving. Single, dual or triple geometry angle versions are available. For further information on Elcometer Novo-Soft™ software, see page 60.

- Auto-ranging from 0-1000 Gloss Units allows gloss readings over the entire range from non-reflective surfaces to mirror finish
- Continuous measurements for variable surfaces
- Calibration possible using any standard
- Full traceability to BAM standards, certificate supplied with each gauge
- Internal calculation of max, min, mean and coefficient of variation
- Software and cable supplied with all statistics models

Can be used in accordance with:	
AS 1580-602.2	ASTM D 523
ASTM C 584	ASTM D 2457
ASTM D 1455	BS 3900-D5
BS 6161-12	DIN 67530
ECCA T2	ISO 2813
ISO 7668	

Units Available	Single Angle	Dual Angle	Triple Angle
Geometry	20°, 60°, 85°	20°, 60°	20°, 60°, 85°
Dimensions	150 x 50 x 110mm (6 x 2 x 4.5")		180 x 50 x 110mm (7 x 2 x 4.5")
Memory	up to 999 readings (Elcometer 402 models only)		
Battery	Internal rechargeable battery		
Accuracy	±0.5 Gloss Units (GU)		
Repeatability	±0.5 Gloss Units (GU)		

Model	Description	Part Number	
		Elcometer 401 Basic Model	Elcometer 402 Statistics Model
Elcometer 401/402	Novo-Gloss™ 20° Glossmeter	J401--20	J402--20
Elcometer 401/402	Novo-Gloss™ 60° Glossmeter	J401--60	J402--60
Elcometer 401/402	Novo-Gloss™ 85° Glossmeter	J401--85	J402--85
Elcometer 401/402	Novo-Gloss™ 20/60° Glossmeter	J401--26	J402--26
Elcometer 401/402	Novo-Gloss™ 20/60/85° Glossmeter	J401-268	J402-268

Please select the appropriate charger from the list below to be supplied with the Elcometer 401 and 402 Glossmeters.

		UK 240V	EUR 220V	US 110V
Accessories	Novo-Gloss™ Charger	T40016344	T40016345	T40016346
	20° Gloss Standard and Certificate	T40016350		
	60° Gloss Standard and Certificate	T40016351		
	85° Gloss Standard and Certificate	T40016352		
	20/60° Gloss Standard and Certificate	T40016353		
	20/60/85° Gloss Standard and Certificate	T40016354		

Other angles are available as well as instruments complying to various standards. Please contact Elcometer for further information.

elcometer®

Elcometer 400 Novo-Curve™ Glossmeter for Curved Surfaces

Increasingly, specifications and standards require an assessment of gloss.
Gloss measurement is necessary to monitor the uniformity, compatibility, or possibly the deterioration of any protective gloss finish.

Using the 4 adjustable posts and the small measurement area, the Elcometer 400 is perhaps the only glossmeter designed specifically for measuring curved surfaces, small components and complex shapes.

Continuous reading mode allows the rapid assessment of finish variation. Measures a whole range of products and designs - including:

- Paint finish
- Wood varnish
- Automobile parts - trim, steering wheel, dashboard
- Plastics - window frames, drinks bottles
- Glazed ceramics
- Frosted glass ….. and much, much more!

The Elcometer 400 Novo-Curve™ is a bench top instrument and parts to be measured are placed over the central aperture.
A positioning system allows repeatable measurements. Statistical analysis is available at the touch of a button and results may be downloaded to a PC via an RS232 interface.

The Elcometer 400 Novo-Curve™ measures over an area approximately 3% of the size of that utilised by a standard glossmeter.

This instrument is designed to store and average up to 199 readings, so it is possible to "average" a larger area and by using a suitable sample population, it is possible to obtain representative results by statistical analysis.

Geometry	60° with auto-ranging - for measurements over the entire Gloss Range - matt to mirror
Dimensions	260 x 220 x 100mm (10 x 8^1/$_2$ x 4")
Weight	2.5kg (5.5lb)
Memory	199 readings
Interface	RS232
Battery	110-120V AC or 220-240V AC
Measurement area	2 x 2mm (0.08 x 0.08")

Model	Description	Part Number		
Elcometer 400	Elcometer 400 Novo-Curve™	J400----1		
Please select the appropriate mains power lead from the list below to be supplied with the Elcometer 400 Novo-Curve™				
		UK 240V	EUR 220V	US 110V
Accessories	Novo-Curve™ Mains Power Lead	T40016566	T40016565	T40016567

Elcometer 6012 Novo-Haze™ Haze Meter

Some materials appear to have considerable difference in gloss yet give comparable readings when measured with a glossmeter at one angle. These materials can be separated by measuring at a second angle and comparing the two readings.

Haze is defined by ASTM D 4039 as the difference between gloss at 60° and the gloss at 20°. Measurements are made by placing the instrument on the test surface and pressing a button. Two consecutive gloss readings are automatically taken and the calculated haze value is displayed. The Elcometer 6012 Novo-Haze™ can also be used as a 20° and 60° glossmeter.

Can be used in accordance with:	
ASTM E 430	ISO 13803

Dimensions	150 x 50 x 100 mm (6 x 2 x 4")	Weight	0.9kg (1.98lb)
Power Supply	Internal Rechargeable Battery	Charger Supply	220-240V AC or 110-120V AC

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110
Elcometer 6012	Elcometer 6012 Novo-Haze™	K0UK6012M001	K0006012M001	K0US6012M001

Elcometer 6013 Novo-Shade™ Reflectometer

The Elcometer 6013 measures shading, irrespective of colour. The test surface is illuminated at an angle of 45° and the intensity of scattered light at the perpendicular (0°), is measured. Data is recorded on a grey scale where black is 0% and white is 100%.

- Instant readings - obtained at the press of a button
- Continuous readings – make a rapid assessment of the surface variation by sliding the instrument whilst pressing the reading button
- Memory – up to 999 readings can be stored – Statistics version only
- Statistics version available – automatic calculation of maximum and minimum values, average and coefficient of variation
- PC Output – download your data to a PC for further analysis or archiving
- Display available in English, French, German, Italian, Spanish, Dutch

Can be used in accordance with:	
ASTM D 2457	ASTM C 346
ASTM D 3258	DIN 55984
FTMS 141 M 6141	ISO 6504
ISO 3906	ISO 2814

Dimensions	150 x 50 x 100mm (6 x 2 x 4")	Weight	0.9kg (1.98lb)
Power Supply	Internal Rechargeable Battery	Charger Supply	220-240V AC or 110-120V AC

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110
Elcometer 6013/1	Elcometer 6013 Novo-Shade™ - Statistics	K0UK6013M001	K0006013M001	K0US6013M001
Elcometer 6013/2	Elcometer 6013 Novo-Shade™ - Basic	K0UK6013M002	K0006013M002	K0US6013M002

Elcometer 6013/5 Novo-Pac™ Hiding Power Meter

Opacity is measured in a similar way to Shade. However opacity, or hiding power, as defined by ISO 2814 involves measuring whiteness of a known film of test material on both a black (less than 5%) and a white (greater than 75%, less than 85%) substrate. A full range of opacity test charts are available – see pages 33-38 for further information.

- Instant readings - obtained at the press of a button
- Continuous readings - make a rapid assessment of the surface variation by sliding the instrument whilst pressing the reading button
- Memory - up to 999 readings can be stored
- PC Output - download your data to a PC for further analysis or archiving
- Statistics - automatic calculation of maximum and minimum values, average and coefficient of variation

Can be used in accordance with:
ISO 13468

Dimensions	150 x 50 x 100mm (6 x 2 x 4")	Weight	0.9kg (1.98lb)
Power Supply	Internal Rechargeable Battery	Charger Supply	220-240V AC or 110-120V AC

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110
Elcometer 6013/5	Elcometer 6013/5 Novo-Pac™	K0UK6013M005	K0006013M005	K0US6013M005

Elcometer 6210 RAL Colour Charts

A system of reference colours, enabling many industrial products to be identified, compared and classified.

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

Can be used in accordance with:
DIN 5381

Model	Description	Part Number
Elcometer 6210/1	Elcometer 6210 RAL Colour Chart k5	K0006210M001
Elcometer 6210/2	Elcometer 6210 RAL Colour Chart k7	K0006210M002
Elcometer 6210/3	Elcometer 6210 RAL Colour Chart f7	K0006210M003
Elcometer 6210/4	Elcometer 6210 RAL Colour Chart f81	K0006210M004
Elcometer 6210/5	Elcometer 6210 RAL Colour Chart f9 DIN 6 military	K0006210M005
Elcometer 6210/6	Elcometer 6210 RAL Colour Chart f9 info federal	K0006210M006
Elcometer 6210/7	Elcometer 6210 RAL Colour Chart f12	K0006210M007
Elcometer 6210/8	Elcometer 6210 RAL Colour Chart f14	K0006210M008
Elcometer 6210/9	Elcometer 6210 RAL Colour Chart 840hr 192 box	K0006210M009
Elcometer 6210/10	Elcometer 6210 RAL Colour Chart f1	K0006210M010
Elcometer 6210/11	Elcometer 6210 RAL Colour Chart f2	K0006210M011
Elcometer 6210/12	Elcometer 6210 RAL Colour Chart f3 5pcs	K0006210M012
Elcometer 6210/13	Elcometer 6210 RAL Colour Chart k1	K0006210M013
Elcometer 6210/14	Elcometer 6210 RAL Colour Chart k6 190 A4 charts	K0006210M014
Elcometer 6210/15	Elcometer 6210 RAL Colour Chart 841-gl 185 charts	K0006210M015
Elcometer 6210/16	Elcometer 6210 RAL A3 Colour Atlas - DIN	K0006210M016
Elcometer 6210/17	Elcometer 6210 RAL A4 Colour Atlas - DIN	K0006210M017
Elcometer 6210/18	Elcometer 6210 RAL Fan-shaped Colour Set (8 volumes)	K0006210M018
Elcometer 6210/19	Elcometer 6210 RAL A4 DIN set 8 fascicles	K0006210M019
Elcometer 6210/20	Elcometer 6210 RAL A6 841-GL DIN set	K0006210M020
Accessories	RAL 841-gl single card to choose - set of 5	KT006210P001
	RAL 840hr single card to choose - set of 10	KT006210P002
	RAL K6 single card	KT006210P007

Elcometer 6070 MA6811 Multi-Angle Spectrophotometer

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

The remote operation feature allows measurement data to be stored. The stored data can be printed directly to a serial printer in a QA report format or downloaded to QA-Master® 2000, X-Rite's Windows® based quality control software package (see pages 76-77).

Measuring Geometrics	45° illumination 15°, 25°, 45°, 75°, 110° aspecular viewing Angular Accuracy ±0.15° Fibre optic pick-up, coupled with DRS technology
Measurement Area	12mm (0.5") diameter
Light Source	Gas-filled tungsten lamp, colour corrected to approximately 4000°K
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12
Standard Observers	2° and 10°
Receiver	Blue-enhanced silicon photodiodes
Spectral Range	400-700nm
Spectral Interval	28 band spectral measurement: 10nm interval from 400nm-640nm 20nm interval from 640nm-700nm 15nm bandwidths
Spectral Data Output	Spectral reflectance values are available for output from the RS232 port for 5 angles at 10nm intervals from 400nm to 700nm
Measurement Range	0 to 400% reflectance
Measuring Time	Approximately 2 seconds
Inter-Instrument Agreement	0.18 ΔE^* average on reference BCRA tile set 0.35 ΔE^* maximum on any chromatic tile 0.15 ΔE^* maximum on any grey tile
Short-Term Repeatability	0.10 ΔE^*ab on white ceramic (standard deviation)
Lamp Life Approx	500,000 measurements
Power Supply	Six rechargeable AA Ni-metal hydride batteries included – removable battery pack; 7.2V DC rated @ 1400 mAh
AC Adapter Requirements	MA68: 90-130V AC, 50-60Hz, 15W maximum MA68X: 180-260V AC, 50-60Hz, 15W maximum 12V DC @ 700mA
Charge Time	In Instrument: 4 hours (50%), 16 hours (100%)
Measurements per Charge	1,000 5-angle measurements
Data Storage (Five Angles)	200 Standards, 850 Samples
Data Interface	Patented bi-directional RS232, 300-19,200 baud
Display	4-row by 20 character supertwist dot matrix LCD
Temperature Range	50° to 104°F (10° to 40°C) 85% Relative Humidity Maximum (non-condensing)
Storage Temperature Range	-4° to 122°F (-20° to 50°C)
Weight	1.4kg (3.2lbs)
Dimensions	116 x 76 x 225mm (4.56 x 3.0 x 8.85")
Supplied with	Calibration Standards, Operating Manual, AC Adapter and Carrying Case.

Model	Description	Part Number
Elcometer 6070	XRITE MA68II Multi-Angle Spectrophotometer	K0006070M001

Elcometer 6075/1 SP60 Portable Sphere Spectrophotometer

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

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

On-Board, Built-In Software
- PROJECTS - User can collect colours under one title.

KEY FEATURES

Measuring Functions and Indices
The SP60 provides absolute and difference measurements for the following colourmetric systems. These values can be obtained from any of the nine illuminants with 2° or 10° observer angle: L*a*b*, DL*Da*Db*, L*C*h°, DL*DC*DH*, DE*ab, DECMC, DE CIE94 and XYZ. Whiteness and Yellowness per ASTM E 313-98.

Pass/Fail Mode
The SP60 stores up to 1,024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

Quick Colour Compare
An operator can take a quick measurement and 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 SP60's diffusing sphere is made of Spectralon®, a durable, highly reflective material designed to perform in a rigorous production environment. The diffusing material prevents premature degradation due to the flaking and chipping of the sphere wall material.

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

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

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

Measuring Geometrics	d/8°, DRS spectral engine, fixed aperture: 8mm viewing/12mm illumination
Light Source	Gas-filled tungsten lamp
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12
Standard Observers	2° and 10°
Receiver	Blue enhanced silicon photodiodes
Spectral Range	400-700nm
Spectral Interval	10nm-measured, 10nm-output
Storage	1,024 standards with tolerances, 2,000 samples
Measurement Range	0 to 200% reflectance
Measuring Time	Approximately 2 seconds
Inter-Instrument Agreement	*CIE L*a*b*:* Average 0.40 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.60 ΔE*ab on any tile (specular component included) *CMC Equivalent:* Average 0.30 ΔEcmc based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.50 ΔEcmc on any tile (specular component included)
Short-Term Repeatability[†]	0.10 ΔE*ab on white ceramic (standard deviation)
Lamp Life	Approximately 500,000 measurements
Power Supply	Removable (Ni-metal hydride) battery pack; 7.2V DC rated @1450mAh
AC Adapter Requirements	90-130V AC, 50-60Hz, 15W maximum
Charge Time	Approximately 4 hours – 100% capacity
Measurements per Charge	1,000 measurements within 8 hour period
Display	64 x 128 pixel graphical LCD
Operating Temperature Range	10°C to 40°C (50°F to 104°F) 85% Relative Humidity Maximum (non-condensing)
Storage Temperature Range	-20°C to 50°C (-4°F to 122°F)
Weight	1.1kg (2.4lbs)
Dimensions	109 x 83 x 195mm (4.3 x 3.3 x 7.7")
Supplied with	Calibration Standards, Operating Manual, AC Adapter and Carrying Case

[†]*Based on 20 measurements on a white tile.*

Model	Description	Part Number		
Elcometer 6075/1	XRITE SP60 Portable Sphere Spectrophotometer	K0006075M001		
		UK 240V	EUR 220V	US 110V
Accessories	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001
	Replacement Rechargeable Battery Pack	KT006075P002		

elcometer®

Elcometer 6075/2 SP62 Portable Sphere Spectrophotometer

The SP62 is a versatile 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 instrument
- Diffuse/8° sphere optical geometry
- 0.15 ΔEcmc inter-instrument agreement
- 4mm, 8mm or 16mm fixed aperture
- Large, easy-to-read graphical LCD display
- PROJECT operation mode
- Flip-back target shoe for flexible use
- Simultaneous measurement of both specular component included and specular component excluded
- Rugged construction
- Rechargeable battery for remote use

On-Board, Built-In Software

- PROJECTS - User can collect colours under one title. Data can be uploaded and/or downloaded via patented, bi-directional communications link to computer software.

KEY FEATURES

Measuring Functions and Indices
The SP62 provides absolute and difference measurements for the following colourmetric systems. These values can be obtained from any of the nine illuminants with 2° or 10° observer angle: CIE XYZ, CIE Yxy, CIE L*a*b*, Hunter LAB, CIE L*c*h° (calculated from ab or uv space), CMC and CIE94. Whiteness and Yellowness in accordance with ASTM E313-98, Metamerism Index and DIN 6172.

Special PROJECT Modes
Multiple colour standards can also be collected under an identified PROJECT, a feature that supports corporate colour standards programs.

Pass/Fail Mode
The SP62 stores up to 1,024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the instrument's LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

Quick Colour Compare
An operator can take a quick measurement and 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 SP62's diffusing sphere is made of Spectralon®, a durable, highly reflective material designed to perform in a rigorous production environment. The diffusing material prevents premature degradation due to the flaking and chipping of the sphere wall material.

Inter-Instrument Agreement
The SP62 has superior inter-instrument agreement – essential in multiple instrument colour-control programs. The SP62 offers excellent inter instrument agreement with X-Rite's SP64 Sphere Spectrophotometer. Both input data into X-Rite's line of Windows-based colour quality assurance and colour formulation software.

Opacity, Colour Strength and Shade Sorting
The SP62 can measure opacity as well as three colour-strength options: chromatic, apparent and tri-stimulus calculations. The SP62 also performs 555 shade sorting. These are important considerations 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 SP62 allows simultaneous measurement of both specular-included (colour) and specular-excluded (appearance).

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

Measuring Geometrics	d/8°, DRS spectral engine Choice of optical aperture: 4mm measurement area/6.5mm target window 8mm measurement area/13mm target window 14mm measurement area/20mm target window
Light Source	Gas-filled tungsten lamp
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12
Standard Observers	2° and 10°
Receiver	Blue enhanced silicon photodiodes
Spectral Range	400-700nm
Spectral Interval	10nm-measured, 10nm-output
Storage	1,024 standards with tolerances, 2,000 samples
Measurement Range	0 to 200% reflectance
Measuring Time	Approximately 2 seconds
Inter-Instrument Agreement	CIE L*a*b*: Average 0.20 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.40 ΔE*ab on any tile (specular component included) CMC Equivalent: Average 0.15 ΔEcmc based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.30 ΔEcmc on any tile (specular component included)
Short-Term Repeatability[†]	0.05 ΔE*ab on white ceramic (standard deviation)
Lamp Life	Approximately 500,000 measurements
Power Supply	Removable (Ni-metal hydride) battery pack; 7.2V DC rated @1450mAh
AC Adapter Requirements	90-130V AC or 100-240V AC, 50-60Hz, 15W maximum
Charge Time	Approximately 4 hours – 100% capacity
Measurements per Charge	1,000 measurements within 8 hour period
Display	128 x 256 pixel graphical LCD
Data Interface	Patented bi-directional RS232, 300-57,000 baud
Operating Temperature Range	10°C to 40°C (50°F to 104°F) 85% Relative Humidity Maximum (non-condensing)
Storage Temperature Range	-20°C to 50°C (-4°F to 122°F)
Weight	1.1kg (2.4lbs)
Dimensions	109 x 83 x 195mm (4.3 x 3.3 x 7.7")
Supplied with	Calibration Standards, Operating Manual, AC Adapter and carrying case

[†]*Based on 20 measurements on a white tile.*

Model	Description	Part Number		
Elcometer 6075/2	XRITE SP62 Portable Sphere Spectrophotometer	K0006075M002		
		UK 240V	EUR 220V	US 110V
Accessories	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001
	Replacement Rechargeable Battery Pack	KT006075P002		

Elcometer 6075/3 SP64 Portable Sphere Spectrophotometer

The SP64 is the *ultimate* 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 instrument
- Diffuse/8° sphere optical geometry
- 0.10 ΔEcmc inter-instrument agreement
- Switchable 4mm or 8mm aperture (optional fixed 16mm)
- Large, easy-to-read graphical LCD display
- JOBS and PROJECT operation mode
- Opacity and colour strength measurement
- Flip-back target shoe for flexible use
- Rugged construction
- Simultaneous measurement of both specular component included and specular component excluded
- Rechargeable battery for remote use

On-Board, Built-In Software:

- JOBS - Available on some models. Walks a user through measurement routines on the production floor. Up to six lines of clear instructions per routine can be displayed after download from X-Rite's software.
- PROJECTS - User can collect colours under one title. Data can be uploaded and/or downloaded via patented, bi-directional communications link to computer software.

KEY FEATURES

Measuring Functions and Indices
The SP64 provides absolute and difference measurements for the following colourmetric systems. These values can be obtained from any of the nine illuminants with 2° or 10° observer angle: CIE XYZ, CIE Yxy, CIE LAB, Hunter LAB, CIE LCH, CMC and CIE94. Whiteness and Yellowness in accordance with ASTM E313-98, Metamerism Index and DIN 6172.

Special JOB and PROJECT Modes
The JOB function is a programmed sequence of specific steps to assist the operator in the colour measurement process. Up to six lines of specific instructions per measurement routine can be downloaded from X-Rite software and displayed on the SP64's LCD screen. Multiple colour standards can also be collected under an identified PROJECT, a feature that supports corporate colour standards programs.

Pass/Fail Mode
The SP64 stores up to 1,024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the instrument's LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

Switchable Apertures
The internal apertures can be quickly changed with the flip of a switch for 4mm or 8mm measurement areas. The instrument will recognise which aperture is being utilized and automatically adapt calibration data. This allows the operator to change the measurement mode quickly and efficiently, depending on the sample size.

The Sphere
The SP64's diffusing sphere is made of Spectralon®, a durable, highly reflective material designed to perform in a rigorous production environment. The diffusing material prevents premature degradation due to the flaking and chipping of the sphere wall material.

Inter-Instrument Agreement
The SP64 has superior inter-instrument agreement – essential in multiple instrument colour-control programs. The SP64 offers excellent inter instrument agreement with X-Rite's SP62 Sphere Spectrophotometer. Both input data into X-Rite's line of Windows-based colour quality assurance and colour formulation software.

Opacity, Colour Strength and Shade Sorting
The SP64 can measure opacity as well as three colour-strength options: chromatic, apparent and tri-stimulus calculations. The SP64 also performs 555 shade sorting. These are important considerations 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 SP64 allows simultaneous measurement of both specular-included (colour) and specular-excluded (appearance).

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

| Measuring Geometrics	d/8°, DRS spectral engine, switchable 4 mm measurement area/6.5mm target window or 8mm measurement area/13mm target window (optional fixed 14mm measurement area/20mm target window)	
Light Source	Gas-filled tungsten lamp	
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12	
Standard Observers	2° and 10°	
Receiver	Blue enhanced silicon photodiodes	
Spectral Range	400-700nm	
Spectral Interval	10nm-measured, 10nm-output	
Storage	1,024 standards with tolerances, 2,000 samples	
Inter-Instrument Agreement	8mm/14mm	CIE L*a*b*: Average 0.13 ΔE*ab based on average of 12 BCRA Series ll tiles (specular component included) Maximum 0.25 ΔE*ab on any tile (specular component included) CMC Equivalent: Average 0.10 ΔEcmc based on average of 12 BCRA Series ll tiles (specular component included) Maximum 0.20 ΔEcmc on any tile (specular component included)
	4mm	CIE L*a*b*: Average 0.20 ΔE*ab based on average of 12 BCRA Series ll tiles (specular component included) Maximum 0.40 ΔE*ab on any tile (specular component included) CMC Equivalent: Average 0.15 ΔEcmc based on average of 12 BCRA Series ll tiles (specular component included) Maximum 0.30 ΔEcmc on any tile (specular component included)
Short-Term Repeatability[†]	0.05 ΔE*ab on white ceramic (standard deviation)	
Measurement Range	0 to 200% reflectance	
Measuring Time	Approximately 2 seconds	
Lamp Life	Approximately 500,000 measurements	
Power Supply	Removable (Ni-metal hydride) battery pack; 7.2V DC rated @ 1450mAh	
AC Adapter Requirements	90-130V AC, 50-60Hz, 15W maximum	
Charge Time	Approximately 4 hours – 100% capacity	
Measurements per Charge	1,000 measurements within 8 hour period	
Display	128 x 256 pixel graphical LCD	
Data Interface	Patented bi-directional RS232, 300-57,000 baud	
Operating Temperature Range	10 to 40°C (50° to 104°F) 85% Relative Humidity Maximum (non-condensing)	
Storage Temperature Range	-20° to 50°C (-4° to 122°F)	
Weight	1.1kg (2.4lbs)	
Dimensions	109 x 83 x 195mm (4.3 x 3.3 x 7.7")	
Supplied with	Calibration Standards, Operating Manual, AC Adapter and carrying case	

[†]Based on 20 measurements on a white tile.

Model	Description	Part Number		
Elcometer 6075/3	XRITE SP64 Portable Sphere Spectrophotometer	K0006075M003		
		UK 240V	EUR 220V	US 110V
Accessories	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001
	Replacement Rechargeable Battery Pack	KT006075P002		

Elcometer 6060 962 Portable 0/45 Spectrophotometer

The Elcometer 6060 is a versatile 0/45 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
- 0/45 optical geometry
- 0.2 ΔE*ab inter-instrument agreement
- Interchangeable apertures for 4mm, 7mm or 15mm measurement area available
- Large, easy-to-read graphical LCD display
- PROJECT operation mode
- Opacity and colour strength measurement
- Reflectance curve graphics display
- Flip-back target shoe for flexible use
- Rugged construction
- Rechargeable battery for remote use

KEY FEATURES

Measuring Functions and Indices
The 962 provides absolute and difference measurements for the following colourmetric systems. These values can be obtained from any of the nine illuminants with 2° or 10° observer angle: CIE XYZ, CIE Yxy, CIE LAB, Hunter LAB, CIE LCH, CMC and CIE94. Whiteness and Yellowness in accordance with ASTM E313-98, Metamerism Index and DIN 6172.

Special PROJECT Mode
Multiple colour standards can also be collected under an identified PROJECT, a feature that supports corporate colour standards programs.

Pass/Fail Mode
The 962 stores up to 1,024 standards with tolerances for easy pass/fail measurement. A red/green LED indicator and the instrument's LCD display provide visual confirmation of results. A tone also sounds to indicate a fail result and measurement completion.

Interchangeable Apertures
The internal apertures can be quickly changed to 4mm (6.5mm target window), 7mm (9m target window) or 15mm (21.5mm target window) measurement areas. This allows the operator to change measurement area quickly and efficiently, depending on sample size.

Inter-Instrument Agreement
The 962 has superior inter-instrument agreement – essential in multiple instrument colour-control programs. The 962 has excellent agreement with X-Rite's 968 0/45 spectrophotometer. Both input data into X-Rite's line of Windows-based colour quality assurance and colour formulation software.

Opacity, Colour Strength and Shade Sorting
The 962 can measure opacity as well as three colour-strength options: chromatic, apparent and tri-stimulus calculations. The 962 also performs 555 shade sorting. These are important considerations in the colour quality control of manufactured products involving plastics, painted or textile materials.

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

Options include:

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

Measuring Geometrics	d/8°, DRS spectral engine, interchangeable apertures: 4mm measurement area/6.5mm target window 7mm measurement area/9mm target window 15mm measurement area/21.5mm target window
Light Source	Gas-filled tungsten lamp
Illuminant Types	C, D50, D65, D75, A, F2, F7, F11 and F12
Standard Observers	2° and 10°
Detector	Blue-enhanced silicon photodiodes
Spectral Range	400-700nm
Spectral Interval	10nm-measured, 10nm-output
Storage	1,024 standards with tolerances, 2,000 samples
Inter-Instrument Agreement	CIE L*a*b*: Average 0.20 ΔE*ab based on average of 12 BCRA Series II tiles (specular component included) Maximum 0.40 ΔE*ab on any tile (specular component included)
Short-Term Repeatability[†]	0.10 ΔE*ab on white ceramic (standard deviation)
Measurement Range	0 to 200% reflectance
Measuring Time	Approximately 2 seconds
Lamp Life	Approximately 500,000 measurements
Power Supply	Removable (Ni-metal hydride) battery pack
AC Adapter Requirements	90-130V AC or 100-240V AC, 50-60Hz, 15W maximum
Charge Time	Approximately 4 hours – 100% capacity
Measurements per Charge	1,000 measurements within 8 hour period
Display	128 x 256 pixel graphical LCD
Data Interface	Patented bi-directional RS232, 300-57,000 baud
Operating Temperature Range	10°C to 40°C (50°F to 104°F) 85% Relative Humidity Maximum (non-condensing)
Storage Temperature Range	-20°C to 50°C (-4°F to 122°F)
Weight	1.1kg (2.4lbs)
Dimensions	109 x 84 x 196mm (4.3 x 3.3 x 7.7")
Supplied with	Calibration Standards, Operating Manual on CD Rom, AC Adapter and Carrying Case

[†]Based on 20 measurements on a white tile.

Model	Description	Part Number		
Elcometer 6060/1	XRITE 962S Portable 0/45 Spectrophotometer – 4mm	K0006060M001		
Elcometer 6060/2	XRITE 962 Portable 0/45 Spectrophotometer – 7mm	K0006060M002		
Elcometer 6060/3	XRITE 962L Portable 0/45 Spectrophotometer – 15mm	K0006060M003		
		UK 240V	EUR 220V	US 110V
Accessories	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001
	Replacement Rechargeable Battery Pack		KT006075P002	

Elcometer 6060/4 964 Portable 0/45 Spectrophotometer

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

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

KEY FEATURES

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

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

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

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

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

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

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

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

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

†Based on 20 measurements on a white tile.

Model	Description	Part Number		
Elcometer 6060/4	XRITE 964 Portable 0/45 Spectrophotometer – 4, 7 and 15mm	K0006060M004		
Accessories	Replacement Rechargeable Battery Pack	KT006075P002		
		UK 240V	EUR 220V	US 110V
	Remote Battery Charger	KTUK6075P001	KT006075P001	KTUS6075P001

Elcometer 6090 X-RiteColor® Master Software

With X-RiteColor® Master Software, has the power to measure, analyse, control and communicate colour data through one sophisticated, yet simple software program. X-RiteColor® Master helps you:

- Reduce cycle time
- Increase efficiency of colour data communication
- Minimise colour waste
- Create multiple formulation matches
- Get control of colour faster
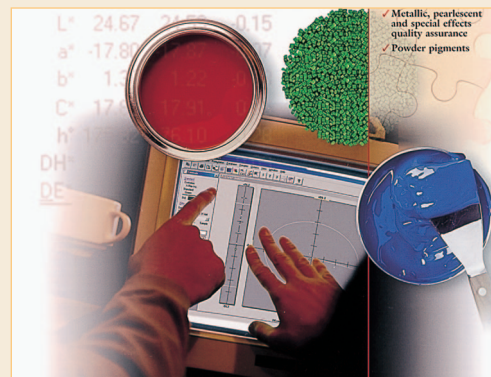
Instrument Compatibility

X-RiteColor® Master is fully compatible with X-Rite's powerful line of 0/45, sphere, multi-angle and non-contact instruments.

With the Elcometer 6065 Benchtop Spectrophotometer, a new dimension is now at hand, providing complete colour quality control solutions that deliver fast and accurate colour measurement and a carefully designed, customer-driven user interface – see pages 78-79.

KEY FEATURES
X-RiteColor® Master Software gives you ultimate control over the information you need with:
Customisable Views: Use the programmable toolbar to tailor the application to your business.
Colour-Coded Tag Plot: Colour code your samples by operator, shift, company or any other tag that you specify. View multiple samples and identify process differences by the criteria you use.
Batch Processing Tools: Select and maintain groups of standards and eliminate inefficient process repetition with these robust tools.
Automated Colourant Calibration: Create an accurate database and enter new colourant data through a simple, efficient batch process.
Custom Calculations: Customize your colourmetric calculations and organise them according to your specifications.
One Page Formula View: View multiple formulas on one screen and sort them according to your requirements.
Manual Entry of L*a*b*: Create a standard or sample by simply entering L*a*b* values for a specific illuminant / observer. Synthetically generate spectral curves and process data against them for accuracy and control.
"One Click" Queued Formulation: Queue multiple standards and formulate them automatically with a single mouse click. Page through individual results or an entire queue with ease.
Communicate Colour Data: X-RiteColor® Master allows you to communicate your colour data in three ways:
X-RiteColor® Master WEB Edition Discover the convenience of server-based computing! With Web Edition, X-RiteColor® Master can be deployed, managed and supported on your Windows 2000 server. Using Microsoft® Internet Explorer and Microsoft® Terminal Services, you can access the server from any location using your Windows-based computer. For colour management needs in multiple locations or plants, X-RiteColor® Master Web Edition provides a high-speed, efficient solution.
Local Area Network (LAN) X-RiteColor® Master is networkable, allowing multiple users to access a single database through a Local Area Network (LAN).
ColorMail® Simply "drag and drop" colour data into an e-mail and "send!" Recipients can "drag and drop" the information onto their applications and view the same data.

X-RiteColor® Master

	Formulation III	Formulation II	Formulation I	QA II	QA I
Communications					
Network (LAN) Version	•	•	•	•	•
Server-Based (Internet) Computing	•			•	
ColorMail® (e-mail)	•	Optional	Optional	Optional	Optional
Multiple Illuminants					
A, C, D50, D65, D75, F2, F7, F11, F12	•	•	•	•	•
Data Views					
Multiple View Capability	•	•		•	
Simple, L*a*b*, indices (L*a*b* data, general and textile), spectral, spectral data, status density, trend, notes and tags, and visual colour	•	•	•	•	•
FMC2	•	•		•	
Formula	•	•	•	•	
Verbal Colour	•	•		•	
Functions					
Colour-coded Tag Plot	•	•		•	
Dot Area/Contrast Ratio Calculation	•	•		•	
Multiple Formulation Methods	•	•	•		
Quick Correct	•	•	•		
Assign and Create Tags	•	•		•	
Filters	•	•		•	
Multiple Tolerances for Standards	•	•		•	
User Defined Controls	•	•		•	
Projects and Jobs	•	•		•	
Alternate Standard Creation	•	•		•	
Delete Sample Set	•	•	•	•	•
Display Options	•	•		•	
Customise Toolbar	•	•	•	•	•
View Sets	•	•		•	
5 and 3 Angle QA Databases	•	•		•	
Create/Modify Calibration Sets	•				
ColorDesigner® Emulation	•				
Vue-Rite® (on-screen colour)	•	•	•	•	•
Reports					
General	•	•	•	•	•
Conformance and Custom	•	•		•	
Sample and Sample Set	•	•	•	•	•
Languages					
English, French, Italian, German, Spanish and Chinese	•	•	•	•	•
Training	•	Optional	Optional	Optional	Optional

Model	Description	Part Number
Elcometer 6090/11	X-RiteColor® Master Formulation I	K0006090M011
Elcometer 6090/12	X-RiteColor® Master Formulation II	K0006090M012
Elcometer 6090/13	X-RiteColor® Master Formulation III	K0006090M013
Elcometer 6090/1	X-RiteColor® Master QA I	K0006090M001
Elcometer 6090/2	X-RiteColor® Master QA II	K0006090M002

Elcometer 6065/1 8200 Benchtop Spectrophotometer

Economical high performance benchtop spectrophotometer for use in the laboratory.

- 400nm UV and illuminant A simulation exclusion filters
- Repeatability (white) 0.02ΔE* average
- Inter-instrument agreement: 0.15ΔE* average (19.0mm aperture); 0.35ΔE* maximum (13-BCRA tiles).

Elcometer 6065/2 8400 Benchtop Spectrophotometer

Designed to maintain global corporate standards, the Elcometer 6065/2 complements all X-Rite industrial colour-measurement solutions and X-Rite portable sphere instruments. The Elcometer 6065 series benchtop sets the standard for precision, accuracy and functionality. The Elcometer 6065/2 features all the attributes of the Elcometer 6065/1 plus superior inter-instrument agreement and repeatability.

- 400nm and 420nm UV exclusion filters
- Repeatability (white) 0.01ΔE* average
- Inter-instrument agreement: 0.08ΔE* average (19.0mm aperture); 0.30ΔE* maximum (13-BCRA tiles)

KEY FEATURES

Accurate sample positioning via image capture – save time and eliminate the need for remeasuring
The Elcometer 6065 Series is the first benchtop spectrophotometer line to introduce built-in image capture technology. This innovative capability lets you capture an image of a sample digitally and view and verify it on your computer monitor before measuring. X-Rite has a patent pending on this technology.

Horizontal and Vertical Positioning
This benchtop spectrophotometer is built to work in two positions – vertical and horizontal. In its standard, front-loading position, you can present and measure samples vertically. In its top-loading position, you can present samples such as powders and liquids horizontally, on the aperture.

Easy-access Transmission Measurement Chamber – Achieve maximum flexibility
The instrument has an extra-wide transmission chamber to accommodate larger samples, including various sized sample holders and cuvettes. In addition, the unit is capable of both direct and total transmission measurement. Whether you're working with transparent plastics, glass, dyes, petroleum or other liquids, you'll find it easy to get precise, accurate measurements of transmitted and absorbed light – without time consuming adjustments.

Inter-instrument Agreement – Share colour data across the supply chain
The Elcometer 6065/2 model complements all X-Rite industrial colour measurement solutions. It provides excellent inter-instrument agreement with X-Rite portable sphere instruments. This allows you to share colour data throughout your enterprise – from lab to lab or lab to production floor. For a global corporate standard solution, choose the Elcometer 6065/2.

User Selectable Illumination Filters – Attain maximum flexibility
UV exclusion filters (400nm and 420nm) and Illuminant A simulation filters are standard on the Elcometer 6065/2 (only the 400nm filter is standard on the Elcometer 6065/1). UV exclusion filtration identifies the presence of fluorescent materials, while Illuminant A simulation filters ensure agreement on fluorescent samples with X-Rite portable spectrophotometers.

Durable, Maintenance Free Spectralon® Sphere – Save on maintenance, improve measurement capability
This is the only benchtop spectrophotometer whose sphere interior is made of machined Spectralon. Patented by X-Rite, Spectralon is a rugged, scientific-grade reflectance material – not a coating. It won't corrode, flake, peel or yellow with age, and it eliminates the need for costly, time-consuming recoating. Spectralon also offers the highest level of reflectance available, maximising measurement results.

Versatile Sample Holder – Appreciate the convenience
The sample holder offers a number of intelligent features to make your job easier:
- Dampening Action: Controlled closing action protects the sample and the instrument.
- Adjustable Sample Alignment Platform: Provides support that helps you place repetitive samples consistently.
- Detent Lever: Allows you to prop the holder open, if necessary

Internal and External Protection – Prevent costly contamination
The instrument has built-in protection from contamination. An optically pure glass plate shields the lamp from damage. A second, optional protection plate is available to guard against spills when the instrument is in a horizontal position.

KEY FEATURES (continued)

USB Interface – Enjoy the convenience
This is the first benchtop spectrophotometer with a USB interface to the software, providing plug-and-play convenience.

Auto UV Calibration for Fluorescence – Save setup time and eliminate errors
X-Rite's software allows you to include automatic UV calibration points for measuring fluorescence. This timesaving feature is valuable for industries that control fluorescence.

Multiple Aperture Accommodation – Achieve exceptional accuracy
The Elcometer 6065 Series gives you the flexibility to choose from three view aperture sizes with their corresponding illumination spot sizes. This allows you to match the aperture to the sample size, maximising your accuracy in fewer measurements. You'll especially like this feature when measuring several different sized samples.

User-defined Instrument Configurations – Save time each time you measure
X-RiteColor® Master Software – manages both quality assurance and colour formulation – controls all the Elcometer 6065 Series functions, so there's no need to interact with an instrument keypad. The software lets you save and store frequently used instrument configurations for quick selection. This timesaving feature allows you to measure samples under various settings. It is also valuable for companies whose instruments are used by multiple people.

	Elcometer 6065/2 (High Performance Unit)	Elcometer 6065/1 (Mid-Range Unit)
Spectrophotometer	Horizontal and Vertical	
Geometry	d/8°	
Sphere Diameter	152.4mm/6" (Spectralon®)	
Specular Component	Included/excluded	
Detector	Photodiode array with holographic grating (x2)	
Light Source	Pulsed Xenon	
Photometric Range	0-200%	
Spectral Range	360-740nm	
Wavelength Interval	10nm	
Reflectance Resolution	0.001%	
Inter-Instrument Agreement	0.08 ΔE* average (19.0mm aperture) 0.30 ΔE* maximum (13-BCRA tiles)	0.15 ΔE* average (19mm aperture) 0.35 ΔE* maximum (13-BCRA tiles)
Repeatability (white)	0.01ΔE* average	0.02ΔE*
Status Indicator	LED	
Measurement Time	Approximately 2 seconds	
Weight	21.4kg (47lbs)	
Software Interface	USB	
Transmission Measurement	Direct and Total	
Fluorescent Measurement	Auto UV Calibration	
UV Exclusion Filtration	400nm and 420nm Illuminant A Filter	400nm
View Aperture Size	4.0/8.0/19.0mm	
Illumination Spot Size	6.5/12.7/25.4mm	
Required Computer	IBM compatible	
Required Software	X-RiteColor® Master (see pages 76-77)	
Sample Holder	Dampening, with adjustable sample alignment platform	
Sample Positioning	Computer imaging with physical reticle	
Sphere Protection	Internal sphere protection plus optional cover for horizontal sample presentation	
Power	230V 50/60Hz : 110V 50/60Hz	
Environment	Operating Temperature 10°C to 40°C (50°F to 104°F). 85% RH non-condensing	

Model	Description	Part Number
Elcometer 6065/1	XRITE Benchtop Spectrophotometer Premier 8200	K0006065M001
Elcometer 6065/2	XRITE Benchtop Spectrophotometer Premier 8400	K0006065M002

Appearance

Stackability & Internal Stress

In mass production of coated items, it is necessary to establish how the coating's characteristics and appearance will change under pressure and at different temperatures – Stackability.

During the coating's drying phase or when a coating is placed into service, temperature and humidity variations can cause 'hygrothermal' stresses which impair the coating's durability.

Elcometer 8400 Heated Press

Designed for determining the stackability of coated metal sheets or tiles.

The Elcometer 8400 is made up of two horizontal parallel plates mounted onto a frame. The upper plate is mobile and can apply a pressing force from 0 up to 30,000 Newtons (6,744 pound force) against the samples – simulating the effect of stacking.

Each plate can be electrically heated and regulated up to 250°C (482°F), thus simulating changes in environmental temperature.

Coated samples, to a maximum sample size of 250 x 250mm (9.8 x 9.8"), are stacked horizontally between the two plates up to a maximum height of 140mm (5.5"), a force is applied and a temperature selected.

The Operator determines the length of time the simulation is to run and once complete, observes the effect on the sample sheets.

Can be used in accordance with:	
EN ISO DIN NF 4622	ISO 4622

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 8400/1	Elcometer 8400 Heated Press – 0-10,000 N (2,248lbf)	K0UK8400M001	K0008400M001	K0US8400M001
Elcometer 8400/2	Elcometer 8400 Heated Press – 0-20,000 N (4,496lbf)	K0UK8400M002	K0008400M002	K0US8400M002
Elcometer 8400/3	Elcometer 8400 Heated Press – 0-30,000 N (6,744lbf)	K0UK8400M003	K0008400M003	K0US8400M003

Drying Time
see pages 39-40

Hardness Testers
see pages 47-54

elcometer®

Elcometer 8300 CoRI Stress Meter

Developed in conjunction with the Coatings Research Institute (CoRI), the Elcometer 8300 has been developed to measure internal stresses in organic coatings, not only during the drying phase but also when a coating is in service where temperature and humidity variations can cause hygrothermal stresses and impair its durability.

The principle is based on measuring the bending of a calibrated plate, coated with the product to be examined. Under pre-determined temperature and humidity conditions, the deflection is measured by a micrometric sensor.

The Elcometer 8300 has a programmable measuring period from 1 second to 99 hours and several possible configurations: manual or automatic cyclic programming and data recording on either a printer or a computer.

- Digital display.
- Motorised opening.
- Working ranges: -10°C to 200°C (14°F to 392°F), or to 100°C (212°F), 10 to 95% RH, depending on equipment.

The Elcometer 8300 is suitable for a variety of applications including:

- Selection of pigments, binders, solvents etc. for the lowest minimum internal stresses.
- Establish paint compositions with optimum durability.
- Study film formation.
- Examine the effects of ageing on the development of internal stresses.

Model	Description	Temperature & Relative Humidity (RH) Range	Part Number		
			UK 240V	EUR 220V	US 110V
Elcometer 8300/1	CoRI Stress Meter	Ambient Temperature	K0UK8300M001	K0008300M001	K0US8300M001
Elcometer 8300/2	CoRI Stress Meter	Ambient to100°C (212°F)	K0UK8300M002	K0008300M002	K0US8300M002
Elcometer 8300/3	CoRI Stress Meter	Ambient to 200°C (392°F)	K0UK8300M003	K0008300M003	K0US8300M003
Elcometer 8300/6	CoRI Stress Meter	-10°C (14°F) to Ambient	K0UK8300M006	K0008300M006	K0US8300M006
Elcometer 8300/7	CoRI Stress Meter	-10°C (14°F) to 100°C (212°F)	K0UK8300M007	K0008300M007	K0US8300M007
Elcometer 8300/8	CoRI Stress Meter	-10°C (14°F) to 200°C (392°F)	K0UK8300M008	K0008300M008	K0US8300M008
Elcometer 8300/10	CoRI Stress Meter	Ambient Temperature plus 10-95%RH	K0UK8300M010	K0008300M010	K0US8300M010
Elcometer 8300/11	CoRI Stress Meter	Ambient to 100°C (212°F) plus 10-95%RH	K0UK8300M011	K0008300M011	K0US8300M011
Elcometer 8300/12	CoRI Stress Meter	Ambient to 200°C (392°F) plus 10-95%RH	K0UK8300M012	K0008300M012	K0US8300M012
Elcometer 8300/13	CoRI Stress Meter	-10°C (14°F) to Ambient plus 10-95%RH	K0UK8300M013	K0008300M013	K0US8300M013
Elcometer 8300/14	CoRI Stress Meter	-10°C (14°F) to 100°C (212°F) plus 10-95%RH	K0UK8300M014	K0008300M014	K0US8300M014
Elcometer 8300/15	CoRI Stress Meter	-10°C (14°F) to 200°C (392°F) plus 10-95%RH	K0UK8300M015	K0008300M015	K0US8300M015
Accessories	Carbon Steel Specimens (Pack of 20)		KT008300P001		
	Stainless Steel Specimens (Pack of 20)		KT008300P002		

Corrosion

One of the many tests described in International Standards for evaluating the corrosion performance of a material is the long-established Salt Spray Test.

Developed several decades ago with the aim of simulating a corrosive marine environment, the procedure has, over the years, become a key tool for predicting the performance of a coating. It is now one of the standard references used in industry today.

Modern quality demands and new research have shown that the results of these tests can be optimised when the salt spray is combined with other methods, which may be of a cyclical nature or more aggressive.

Elcometer 1537 ISO Scratching Tool

A scratching tool for preparing samples for Salt Spray and Cyclical Tests.

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

Can be used in accordance with:	
ISO 2063	NBN 755

Model	Description	Part Number
Elcometer 1537	Elcometer 1537 ISO Scratching Tool	K0001537M001

Elcometer 1538 DIN Scratching Tool

The Elcometer 1538 has interchangeable carbide cutters for the preparation of specimens to be used for Salt Spray and CASS Corrosion Tests.

Supplied complete with a 1mm or 0.5mm cutter.

A Renault-version of the tool, with optional blade adjustment device, is also available.

See also the Elcometer 1535 on page 51 for an automatic scratch machine which provides the user with a repeatable and reproduceable method of performing numerous test samples.

Can be used in accordance with:	
DIN 53167	DIN 50021

Model	Description	Part Number
Elcometer 1537	Elcometer 1537 ISO Scratching Tool	K0001537M001
Elcometer 1538/1	Elcometer 1538 DIN Scratching Tool with 1mm Cutter – CASS Test	K0001538M201
Elcometer 1538/2	Elcometer 1538 DIN Scratching Tool with 0.5mm Cutter – Salt Spray Test	K0001538M202
Elcometer 1538/3	Elcometer 1538 DIN Scratching Tool with 1mm Cutter – Renault Version	K0001538M005
Elcometer 1538/4	Elcometer 1538 DIN Scratching Tool with 0.5mm Cutter – Renault Version	K0001538M004
Accessories	Spare 0.5mm Cutter	KT001538N003
	Spare 1mm Cutter	KT001538N201
	Elcometer 1538 DIN Blade Adjustment Device	KT001538M103

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Elcometer 1120 Salt Spray Tester – BS1

The quality and reproducibility of the salt spray tests depend directly on a stringent control of testing parameters, prescribed particularly by ISO 9227 and other international standards.

The Elcometer 1120 Salt Spray Tester is designed to perform, with high reproducibility, a large number of standardised or conventional tests in order to determine the resistance to corrosion for a wide range of coatings. These include salt spray, copper acetic salt spray (CASS), prohesion, humidity and cyclic DIN. The Elcometer 1120 can also be adapted to be a humidity chamber.

The Elcometer 1120 is available in 3 capacities:

- 400 litres (105 US gallons)
- 1000 litres (264 US gallons)
- 2000 litres (528 US gallons)

Can be used in accordance with:	
ASTM B 117	ASTM B 287
ASTM B 368	ASTM G 85
BS 5466	BS 3900 F4
BS 7479	DIN 50907
DIN 53167	DIN 50021
ECCA T 8	EN 4.4.9 175
ISO 1456	ISO 3768
ISO 7253	ISO 9227
JIS Z 2371	NF DIN EN ISO 4623
NF X 41-002	SIS 184190

RATIONAL AND ROBUST CONSTRUCTION (see diagram below)

1. Control Panel – all operations (instructions, adjustments, checks and safeguards) are brought together and displayed on this microprocessor controlled digital panel. The User can instantly check the status of the chamber.

2. Solution Tank – with a capacity of 200 litres (53 US Gallons), the unit can operate continuously for over 500 hours (400 litre / 105 US Gallon model), without attention. An electronic sensor warns when the solution has reached the minimum level. An optional air mixer can be incorporated into the unit if required.

3. Central Dispersion – The filtered solution is carried to a spray nozzle by an adjustable flow peristaltic pump. Central, adjustable orientation dispersion ensures that the spray is uniform.

4. Saturator – After filtering, the compressed air is humidified and heated to the preset temperature by the saturator, which is topped up automatically with demineralized water. Should there be a major drop in the level or an accidental loss of water, a safety device prevents overheating.

5. Manometer – The pressure of the compressed air in the saturator is permanently indicated on the gauge. An electronic gauge with built in alarm is an optional accessory and displays the pressure reading on the control panel.

6. Cover – All models are supplied with a translucent cover.

7. Exposure Chamber – Made of smoothly finished reinforced glass fibre polyester, the chamber does not corrode and can withstand repeated thermal and hygrometric variations. It is heated directly from the outside by a sleeve of thermal textile. A thick layer of insulating material prevents heat loss and thus increases energy efficiency. The cover fits into grooves moulded into the upper edge of the chamber, which are then filled with water to create a perfect hydraulic seal.

Internal lateral partitions are provided so that bars for fastening large pieces into position and sample racks can easily be installed.

Demineralized Water Supply (optional)

Compressed Air

— Control and adjustment circuits

Insulating Material

— Heating Textile

Compressed Air

Compressed Air (optional - Cyclic DIN)

Brine Solution

Demineralized Water

Temperature Probes

Level Detectors

Pressure Sensor (optional)

Electro-valves

⊗ Peristaltic Pump

Standard Equipment	
Exposure Chamber	Reinforced glass fibre polyester – cover in translucent plexiglass
Brine Tank	Contents 200 litre (53 US Gallons) – integrated filter – level indicator in the cabinet
Saturator	Insulated, with safety valve and level indicator. Demineralized water supply
Supply Systems	Brine: Adjustable flow peristaltic pump, low level control with alarm. Automatic Stop after 72 hours without refilling Saturator: Electronic level regulator and electromagnetic valve
Control Panel	Microprocessor control. Automatic control of all essential functions and run of the tests
Heating Systems	Chamber: Heating textile fixed to the exterior. PID temperature control from ambient to 50ºC (122ºF). Safety device and alarm. Independent thermal switch Saturator: Resistance heater in stainless steel. PID temperature control from ambient to 70ºC (158ºF). Safety device and alarm, if empty
Pneumatic System	Compressed air distribution cock with filter, pressure regulator and manometer. Pressure supplied to the spray nozzle by electromagnetic valve
Operating Pressures	Saturator demineralised water supply - Minimum: 2bar (29PSI); Maximum: 5bar (72.5PSI) Compressed air supply – Minimum: 2bar (29PSI); Maximum: 8bar (116PSI)

Dimensions							
Capacity	Chamber			Overall			Sample Capacity (Sample Size 10 x 15cm/4 x 6")
	Length	Width	Height	Length	Width	Height	
400 litre 105 US Gallon	75cm 29.5"	75cm 29.5"	75cm 29.5"	150cm 59.0"	110cm 43.3"	140cm 55.1"	120
1,000 litre 264 US Gallon	120cm 47.2"	120cm 47.2"	75cm 29.5"	200cm 78.7"	160cm 63.0"	140cm 55.1"	240
2,000 litre 528 US Gallon	193cm 76.0"	105cm 41.3"	100cm 39.3"	275cm 108.2"	135cm 53.1"	165cm 65.0"	440

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1120/1	Elcometer 1120 Salt Spray Tester – 400 litre (105 US Gallon)	K0UK1120M001	K0001120M001	K0US1120M001
Elcometer 1120/2	Elcometer 1120 Salt Spray Tester – 1000 litre (264 US Gallon)	K0UK1120M002	K0001120M002	K0US1120M002
Elcometer 1120/3	Elcometer 1120 Salt Spray Tester – 2000 litre (528 US Gallon)	K0UK1120M003	K0001120M003	K0US1120M003

Options – please specify when ordering	
Programr for automatic operation	KT001150P015
Cyclic Test – DIN 50907 and DEF 1053 Method 36	KT001120N005
Adaptation for ASTM B 368 and ISO 9227 CASS Test	KT001120N001
Cyclic Device for Prohesion Test	KT001120N007
Adaptation for ASTM G 85 SWAAT	KT001120N011
Adaptation for VALEO SWAAT	KT001120N012
Condensed water accessory for DIN 50 017 (manual programming)	KT001120P165
Automatic Stop when compressed air cuts off	KT001120N010
Traceability Kit – RS232 Output, printer, connecting cable and electronic pressure sensor	KT001120N013
Compressed Air Mixer – for stirring Brine Salt Solution	KT001120N017
Lifting device with Counterweight (for easy cover refits) – Elcometer 1120/2 and 1120/3 only	KT001200N950

| Accessories	
PVC Test Panel Support Rack Support can place up to 22 test panels (100 x 200mm/39 x 79"), 5 supports can be placed in the Elcometer 1120/1, more can be placed in the Elcometer 1120/2 and Elcometer 1120/3	KT001150P012
Assembly of 10 PVC Test Panel Support Rack with central holder for spray nozzle. Each rack can place up to 20 test panels (100 x 200mm/39 x 79"), between 15º and 20º	KT001150P158
P6 Demineralizer for tap water, plus 2 resin cartridges	KT001120N014
100ml Rain Gauge	KT001120N002
Sodium Chloride Refractometer – for condensate analysis.	KT001120N006

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Elcometer 1120/4 Cyclic Salt Spray Tester – BS2

The Elcometer 1120/4 Cyclic Salt Spray Tester extends the performance of the Elcometer 1120 BS1 Salt Spray Tester, increasing the investigation capability.

Thanks to the built-in programming module, specific test procedures can be created by alternating and repeating different exposure phases:

- Solution spray, Dry or saturated humidity, and Dwell time at a given temperature

The combination of these essential parameters is intended to bring to traditional methods valuable complementary information.

Besides this operating flexibility, the Elcometer 1120/4 offers effective versatility by also including preprogrammed tests such as:

- Salt Spray, Copper Acetic Salt Spray (CASS), Prohesion, and Cyclic DIN

The Elcometer 1120/4 is available in 400 litres (105 US gallons) capacity.

Can be used in accordance with:	
ASTM B 117	ASTM B 287
ASTM B 368	ASTM G 85
BS 5466	BS 3900 F4
BS 7479	DIN 50907
DIN 53167	DIN 50021
ECCA T 8	EN 4.4.9 175
ISO 1456	ISO 3768
ISO 7253	ISO 9227
JIS Z 2371	NF DIN EN ISO 4623
NF X 41-002	SIS 184190

Standard Equipment	
Exposure Chamber	Reinforced glass fibre polyester – cover in translucent plexiglass
Brine Tank	Contents 200 litre (53 US Gallons) – integrated filter – level indicator in the cabinet
Saturator	Insulated, with safety valve and level indicator. Demineralized water supply
Supply Systems	Brine: Adjustable flow peristaltic pump, low level control with alarm. Automatic Stop after 72 hours without refilling Saturator: Electronic level regulator and electromagnetic valve
Control Panel	Microprocessor control. Automatic control of all essential functions and run of the tests
Heating Systems	*Chamber:* Heating textile fixed to the exterior. PID temperature control from ambient to 50ºC (122ºF). Safety device and alarm. Independent thermal switch. *Saturator:* Resistance heater in stainless steel. PID temperature control from ambient to 70ºC (158ºF). Safety device and alarm if empty.
Pneumatic System	Compressed air distribution cock with filter, pressure regulator and manometer. Pressure supplied to the spray nozzle by electromagnetic valve.
Operating Pressures	Saturator demineralised water supply - Minimum: 2bar (29PSI); Maximum: 5bar (72.5PSI) Compressed air supply – Minimum: 2bar (29PSI); Maximum: 8bar (116PSI)
Exhaust Outlet	Independent outlet from the condensation drain
Drying	Drying (for dry humidity) is achieved by an air blower, variable temperature from ambient to 60ºC (140ºF)
Additional Spray Circuit	For saturated humidity – with a peristaltic pump, which uses demineralised water from user's installation
Working Modes	Pre-programmed tests: Salt Spray; CASS; Prohesion, Cyclic DIN Cyclic mode, programmable: integrated into the internal operating software Programs set up via control panel or with PC Software (optional accessory)
Programmable Parameters	Temperature: Chamber: ambient to 60ºC (140ºF) Saturator: ambient to 70ºC (158ºF) Drying: Ambient to 60ºC (140ºF) Duration of Solution Spray – Drying – Saturated Humidity – Dwell – Ventillation. Loop: Maximum 99 per step
Memory	Each Program contents: up to 19 steps; Memory Capacity: 8 programs 2 additional programs – predefined in the factory with user's parameters – these can't be modified later
Tests Operation	Pre-programmed or cyclic tests can be started and interrupted at any time. Control, regulation, safety and alarm functions as for the Elcometer 1120 Salt Spray Tester

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1120/4	Elcometer 1120/4 Cyclic Salt Spray Tester	K0UK1120M004	K0001120M004	K0US1120M004
Options *please specify when ordering*	Software for programming the PC, including RS232 interface			KT001120N019
	Compressed Air Mixer – for stirring Brine Salt Solution			KT001120N017
	Automatic Stop when compressed air cuts off			KT001120N010
Accessories	PVC Test Panel Support Rack - up to 22 test panels (100 x 200mm/39 x 79"), 5 supports can be placed inside			KT001150P012
	Assembly of 10 PVC Test Panel Support Rack with central holder for spray nozzle. Each rack can place up to 20 test panels (100 x 200mm/39 x 79"), between 15º and 20º			KT001150P158
	P6 Demineralizer for tap water, plus 2 resin cartridges			KT001120N014
	100ml Rain Gauge			KT001120N002
	Sodium Chloride Refractometer – for condensate analysis			KT001120N006

Elcometer 1250 Kesternich Chamber

To test the resistance to corrosive gases such as SO_2 or CO_2. Housed in reinforced polyester for corrosion resistance.

- Digital display
- Capacity: Either 300 or 400 litres
  (79 or 105 US gallons)
- Regulated temperature up to 50°C. (122°F)
- Ambient or saturated humidity.
- Front door access
- forced drying

Can be used in accordance with:	
BS 3900	DIN 50017
EN 6988	

Options – contact Elcometer for further information

- Temperature extension to 60°C (140° F)
- automatic ventilation system
- gas dosing device
- cycle totalizer

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1250/1	Kesternich Chamber, high humidity, 300 litre (79 US gallons)	K0UK1250M010	K0001250M010	K0US1250M010
Elcometer 1250/2	Kesternich Chamber, high humidity, 400 litre (105 US gallons)	K0UK1250M210	K0001250M210	K0US1250M210
Options *please specify when ordering*	Gas Dosing Unit	KT001250N014		
	Temperature extension to 60°C (140°F)	KT001250N015		
	Automatic Ventilation System	KT001250N016		
	Cycle Totalizer	KT001250N017		

Elcometer 1200/4 ISO Continuous Humidity Chamber

A simple to use, continuous humidity chamber to meet the test conditions required by ISO 6270. The Elcometer 1200/4 is of a welded polypropylene tank construction. The PVC cover has two sides, each at an angle of 15 degrees to the horizontal.

The Unit is switched on and water is fed in, through the inlet pipe, under pressure (1-5 bar). Once the water is at the required level, the unit begins to heat and maintain the water to the set temperature (40°C ±2°C/104°F ±4°F, and not less than 35°C/95°F for ISO 6270).

Up to 20 test panels, 150 x 100mm (5.9 x 3.9"), are then inserted into the spaces in the PVC cover.

Note: To meet the ISO 6270 Standard, all 20 must be filled.

Can be used in accordance with:
ISO 6270

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1200/4	Continuous Humidity Chamber – ISO 6270	K0UK1200M004	K0001200M004	K0US1200M004

Elcometer 1270/1 Ford Bath Immersion Test

A tank, measuring 70 x 40 x 40cm (27.5 x 16 x 16"), fitted with a cover, a controlled heating device and a circulation pump, is used to assess the resistance of coatings, notably to blistering, when immersed in water.

Coated metal sheets are laid at an angle of 15°-20° on a grooved bottom and fully immersed in deionised water, warmed to 40°, ± 1°C (104°F ±2°F).
Once a predetermined time is reached, the samples are removed and the coating is inspected.

Supplied with an adjustable overheating safety system.

Can be used in accordance with:	
ISO 2812-2	NFT 30 053-2
NF T 30 054	Renault RNUR 1327

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1270/1	Elcometer 1270 Ford Bath Immersion Test – Digital Control	K0UK1270M301	K0001270M301	K0US1270M301

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Elcometer 1200 Humidity Chamber

The Elcometer 1200 is designed to perform, highly reproducible, constant humidity tests.

Coated samples are placed into the chamber and, after a predetermined time, removed for inspection. The Elcometer 1200 Humidity Chamber is used to monitor a coating's resistance to corrosion, tropicalisation, blistering and other effects caused by humid environments.

The Elcometer 1200 is available in three capacities:

- 400 litres (105 US gallons)
- 1000 litres (264 US gallons)
- 2000 litres (528 US gallons)

Similar in construction and design to the Elcometer 1120 – see page 84 for further information. The Elcometer 1200 generates a relative humidity from 95 to 100% RH, at a temperature from ambient to 50ºC (122ºF).

The Elcometer 1200 can also be adapted with a sulphur dioxide kit to meet the following standards: DIN 50017, 50018; NF-T 30-055; and ISO 3231.

Can be used in accordance with:	
ASTM D 2246	ASTM D 2247
DIN 50017	DIN 50018
ISO 3231	NF T 30-055

Standard Equipment	
Exposure Chamber	Made of smoothly finished reinforced glass fibre polyester, the chamber does not corrode and can withstand repeated thermal and hygrometric variations. It is heated directly from the outside by a sleeve of thermal textile. A thick layer of insulating material prevents heat loss and thus increases energy efficiency. The cover fits into grooves moulded into the upper edge of the chamber, which are then filled with water in order to create a perfect hydraulic seal.
Heating Systems	Heating textile fixed to the exterior. PID temperature control from ambient to 50ºC (122ºF). Safety device and alarm. Independent thermal switch.
Water Plane	Generates 95 to 100% RH.

Dimensions							
Capacity	Chamber			Overall			Sample Capacity Sample Size 10 x 15cm/4 x 6"
	Length	Width	Height	Length	Width	Height	
400 litres 105 US Gallons	75cm 29.5"	75cm 29.5"	75cm 29.5"	150cm 59.0"	110cm 43.3"	140cm 55.1"	120
1,000 litres 264 US Gallons	120cm 47.2"	120cm 47.2"	75cm 29.5"	200cm 78.7"	160cm 63.0"	140cm 55.1"	240
2,000 litres 528 US Gallons	193cm 76.0"	105cm 41.3"	100cm 39.3"	275cm 108.2"	135cm 53.1"	165cm 65.0"	440

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 1200/1	Elcometer K1200 Humidity Chamber 400 litres (105 US Gallons)	K0UK1200M001	K0001200M001	K0US1200M001
Elcometer 1200/2	Elcometer K1200 Humidity Chamber 1000 litres (264 US Gallons)	K0UK1200M002	K0001200M002	K0US1200M002
Elcometer 1200/3	Elcometer K1200 Humidity Chamber 2000 litres (528 US Gallons)	K0UK1200M003	K0001200M003	K0US1200M003
Options *please specify*	Spraying System – sprays water inside the chamber, water coming from the bottom of the chamber	KT001200N001		
	Lifting device with counterweight (for easy cover lifting) only available for the Elcometer 1200/2 and 1200/3	KT001200N003		
Accessories	PVC Test Panel Support Rack – Support can place up to 22 test panels (100 x 200mm/39 x 79") at an angle of 15º. Five supports can be placed in the Elcometer 1200/1, more can be placed in the Elcometer 1200/2 and Elcometer 1200/3	KT001150P012		

Elcometer 120 Solar Box

This compact unit is equipped with an air-cooled Xenon light source for evaluating the ageing effects of solar light on numerous materials.

It has adjustable irradiation from 250 to 800W/m^2 and a choice of 4 UV filters to allow different test conditions to be simulated:

- *280nm:* Standard model, exposure at high altitudes
- *300nm:* Normal direct insulation
- *310nm:* Glass filtered
- *Infra Red:* for reducing sample temperature

Can be used in accordance with:	
ASTM D 5071	BS 1006
ISO 11341	ISO 4892
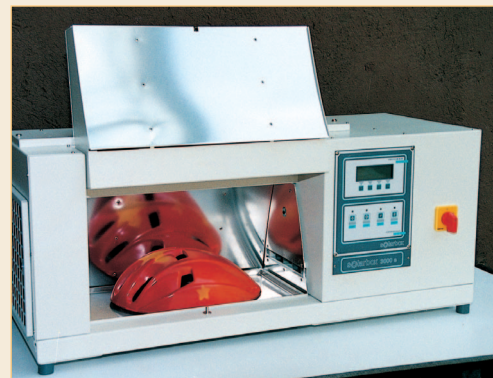
Four models of the Elcometer 120 are available

Elcometer 120/1	Elcometer 120/2	Elcometer 120/3	Elcometer 120/4
Countdown timer and hour counter	*All of the features of the Elcometer 120/1 plus:*	Countdown timer and hour counter	*All of the features of the Elcometer 120/3 plus:*
1500W air-cooled lamp	Microprocessor for programming cycles and end point.	2500W air-cooled lamp	Microprocessor for programming cycles and end point.
Controlled power system for constant irradiance	4 lines, 20 character LCD display	Controlled power system for constant irradiance	4 lines, 20 character LCD display
Infinitely variable irradiance via control knob up to 1000W/m^2	Control and display of irradiance	Infinitely variable irradiance via control knob up to 1000W/m^2	Control and display of irradiance
280nm filter for maximum UV effect	Control and display of BLACK Standard Temperature	280nm filter for maximum UV effect	Control and display of BLACK Standard Temperature
Removable sample tray with exposure area 200 x 280mm (7.9 x 11")	Up to 15 memorised test programs, free programming	Removable sample tray with exposure area 200 x 420mm (7.9 x 16.5")	Up to 15 memorised test programs, free programming
Dimensions: 730 x 370 x 350mm (28.7 x 14.5 x 13.8")	Complete test report via RS 232 serial interface	Dimensions: 870 x 370 x 350mm (34.2 x 14.5 x 13.8")	Complete test report via RS 232 serial interface
Electrical connection to 200-240V AC, 50/60Hz, 1n/PE		Electrical connection to 200-240V AC, 50/60Hz, 1n/PE	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 120/1	Elcometer 120 Solar Box 1500 Standard Model	K0UK0120M004	K0000120M004	K0US0120M004
Elcometer 120/2	Elcometer 120 Solar Box 1500 Enhanced Model	K0UK0120M003	K0000120M003	K0US0120M003
Elcometer 120/3	Elcometer 120 Solar Box 3000 Standard Model	K0UK0120M005	K0000120M005	K0US0120M005
Elcometer 120/4	Elcometer 120 Solar Box 3000 Enhanced Model	K0UK0120M006	K0000120M006	K0US0120M006

Options *please specify when ordering*	Description	Part Number
	Irrigation System for weather resistance of materials for cyclic sample immersion during test - Elcometer 120/2	KT000120N005
	Irrigation System for weather resistance of materials for cyclic sample immersion during test - Elcometer 120/4	KT000120N006

Accessories		Part Number
	280nm UV Filter for Elcometer 120/1 and 120/2	KT000120P001
	310nm UV Filter for Elcometer 120/1 and 120/2	KT000120N002
	IR Infrared Filter for Elcometer 120/1 and 120/2	KT000120N003
	Xenon Light 1500W for Elcometer 120/1 and 120/2	KT000120P002
	280nm UV Filter for Elcometer 120/3 and 120/4	KT000120P005
	310nm UV Filter for Elcometer 120/3 and 120/4	KT000120N008
	IR Infrared Filter for Elcometer 120/3 and 120/4	KT000120N009
	Xenon Light 2500W Elcometer 120/3 and 120/4	KT000120P004
	Air Filter Set (Pack of 3)	KT000120P003
	Magnetic Agitator	KT000120N004
	Multimeter with interchangeable sensors, portable, radiometer and thermometer with carrying case - supplied without sensors	KT000122M001
	Multimeter sensor – 340nm; narrow band	KT000122N001
	Multimeter sensor – 420nm; narrow band	KT000122N003
	Multimeter sensor – 295-400nm; wide band total UV sensor	KT000122N004
	Black panel temperature sensor	KT000122N006

Corrosion

Material Thickness

The thickness of materials cannot always be determined by direct measurement as access to both sides is not always possible.

The effects of corrosion and erosion at the back of a metal panel may reduce its thickness significantly yet not affect the front surface. Pipelines, for example, may have been eroded by the flow of material inside.

Machined or cast items may have thin walls that cannot be determined by callipers or other not-destructive tests.

Elcometer 205 & 206 Ultrasonic Thickness Gauges

These robust, hand held instruments are used for measuring the thickness of materials where access to only one side of the test piece is available.

Many different materials can be measured including steel, cast iron, plastic, epoxy resin and glass fibre, etc.

- Three calibration options – Single Point Calibration, Two Point Calibration, Speed of Sound
- Hand held and robust
- Backlight display on all versions
- Data output available on the Elcometer 206 and 206DL. EDTS[+] Excel Link software supplied free of charge with the Elcometer 206DL
- Memory capacity of 1000 readings on 206DL
- Can be used with EDCS[+] Thickness Management Software (see page 146)

Maximum measurement range	0.63-500mm (0.025-19.999") (dependent on transducer and material)
Velocity range	1250-10000m/s (0.0492-0.3930in/μs)
Accuracy	±0.01mm (0.001") (Depends on material and conditions)
Resolution	0.01mm (0.001")
Units	millimetres and inches
Operating temperature	-20 to 50°C (-20 to 120°F)
Keypad type	Sealed Membrane
Display	4$^1/_2$ Digit Liquid Crystal Display with Backlight
Transducer	Select from Transducer Data Sheet on Pages 93-94
Power	AA 1.5V Alkaline or 1.2V NiCad cell
Battery life	200hrs Alkaline (120hrs NiCad)
Weight	295g (10oz)
Size	63.5 x 120.6 x 31.75mm (2.5 x 4.75 x 1.25")
Case type	Extruded aluminium

	Elcometer 205	Elcometer 206	Elcometer 206DL
High Speed Scan Mode	•	•	•
Differential Mode		•	•
Alarm Mode		•	•
Data Output		•	•
Data-Logging			•
EDTS[+] Excel Link Software		○	•
EDCS[+] Software		○	○
Part Number	C205----1	C206----1	C206DL----1
Accessories	Ultrasonic Couplant (160ml)		T92015701
	High Temperature Ultrasonic Couplant (80ml)		T92015874
	Test Wedge 2-25mm		T9205243-
	Test Wedge 30-100mm		T9205270-

• = Included   ○ = Optional   For an explanation of these options see page 96

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Elcometer 208 Ultrasonic Thickness Gauges

The Elcometer 208 and 208DL are simple to use hand held Ultrasonic Thickness Gauges with the capability to measure material thickness whilst eliminating the thickness of the coating (on metal substrates only).

- Ignores the coating thickness
- Data output
- EDTS+ Excel Link Software supplied free of charge with 208DL for report generation and archiving
- Compatible with EDCS+ Thickness Management Software – Optional, see page 146

- Hand held and robust
- Backlight display

Measurement range	0.63-500mm (0.025-19.999") 2.54-25.4mm (0.100 to 1.0") – in Echo-to-Echo Mode
Velocity range	1250-10000m/s (0.0492-0.3930in/µs)
Accuracy	±0.01mm (0.001")
Resolution	0.01mm (0.001")
Units	millimetres and inches
Operating temperature	-20 to 50°C (-20 to 120°F)
Keypad	Sealed membrane
Display	Digit Liquid Crystal Display with Backlight
Power	AA 1.5V Alkaline or 1.2V NiCad cell
Weight	295g (10oz)
Size	63.5 x 120.6 x 31.75mm (2.5 x 4.75 x 1.25")
Case	Extruded aluminium

Description		Elcometer 208	Elcometer 208DL
Echo-to-Echo Mode		•	•
High Speed Scan Mode		•	•
Alarm Mode		•	•
Data Output		•	•
Data Logging			•
EDTS+ Excel Link Software		❍	•
EDCS+ Software		❍	❍
Part Number		C208----1	C208DL----1
Accessories	5MHz High Damped Transducer - For steel applications	T92016967	
	7.5MHz High Damped Transducer - Aluminium, stainless steel and titanium applications	T92016968	
	Ultrasonic Couplant (160ml)	T92015701	
	Test Wedge 2-25mm	TX9205243-	
	Test Wedge 30-100mm	T9205270-	

The Elcometer 208 and Elcometer 208DL are not supplied with a transducer, please either select the specific Elcometer 208 transducer above or select from the Transducer Data Sheet on pages 93-94.

- = Included   ❍ = Optional   For an explanation of these options see page 96.

Ultrasonic Transducer Options

Elcometer have a wide range of transducers to meet your requirements, including:

- A Range of frequencies and sizes
- Straight and Right Angle Transducers available as Potted or Microdot Transducers
  - Potted Transducers: Transducer cable is fixed to the transducer head
  - Microdot Transducers: Plug in cables allowing transducer head or cable to be replaced quickly and easily
- High Temperature Transducers: Temperature up to 340ºC (650ºF)

When selecting a transducer, it is important to choose one which will best meet your application, taking into consideration:

- The measurement range
- The type of material to be tested
- The design of the transducer probe
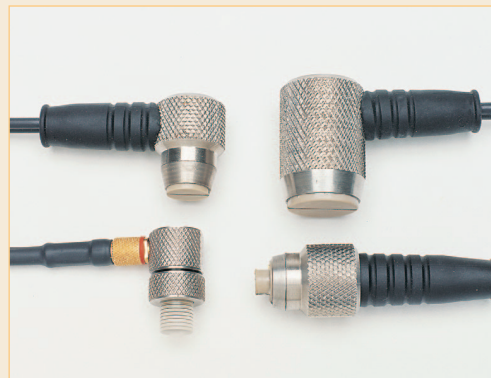
SPEED OF SOUND THROUGH MATERIALS

Elcometer Ultrasonic Thickness Gauges can be programmed by the user to the appropriate material in two ways:

- Known standard of the same material – set the calibration to the thickness
- The frequency calibration – set the frequency to the appropriate value using the Velocity Chart below:

Material	km/sec	in/msec
Air	0.33	0.013
Aluminium 2024-T4	6.38	0.251
Beryllium	12.88	0.507
Boron Carbide	10.92	0.430
Brass	4.39	0.173
Cadmium	2.77	0.109
Copper	4.65	0.183
Glass (plate)	5.77	0.227
Glycerine	1.93	0.076
Gold	3.25	0.128
Inconel	5.82	0.229
Iron	5.89	0.232
Iron, Cast	4.55	0.179
Lead	2.16	0.085
Magnesium	5.84	0.230
Mercury	1.45	0.057
Molybdenum	6.25	0.246
Monel	5.36	0.211
Motor Oil (SAE 30)	1.75	0.069

Material	km/sec	in/msec
Neoprene	1.60	0.063
Nickel	5.64	0.222
Nylon	2.69	0.106
Platinum	3.96	0.156
Plexiglass	2.69	0.106
Polystyrene	2.34	0.092
Polyurethane	1.78	0.070
PVC	2.39	0.094
Quartz	5.74	0.226
Silver	3.61	0.142
Steel (4340)	5.84	0.230
Steel (303 Stainless)	5.66	0.223
Teflon	1.52	0.060
Tin	3.33	0.131
Titanium	6.10	0.240
Tungsten	5.18	0.204
Uranium	3.38	0.133
Water	1.47	0.058
Zinc	4.32	0.170

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ULTRASONIC TRANSDUCER SELECTION TABLE FOR ELCOMETER 205, 206, 206DL, 208, 208DL

Measurement Range in steel mm (inches)	Material								Probe Type							Part Number	Frequency MHz (Colour Code)	Crystal Diameter mm (inches)	Wearface Diameter mm (inches)
	Cast Iron	Plastic	Glass Fibre	Thin Glass Fibre	Steels	Glass	Thin Plastic	Aluminium	Potted	Straight Probe	Right Angle Probe	Microdot	High Temp. (340°C/650°F)	Extra Resolution	Exxon Specification				
3.8 – 51 (0.15 – 2.0)	•	•	•						•	•						T92015620	1.0 (brown or yellow)	12.7 (1/2)	15.9 (5/8)
	•	•	•						•		•					T92015621			
	•	•	•							•		•				T92015622			
	•	•	•								•	•				T92015623			
1.5 – 102 (0.06 – 4.0)	•	•		•					•	•						T92015626	2.25 (red)	6.4 (1/4)	9.5 (3/8)
	•	•		•					•		•					T92015627			
	•	•		•						•		•				T92015628			
	•	•		•							•	•				T92015629			
	•	•		•					•	•				•		T92015631			
	•	•		•						•		•		•		T92015632			
1.5 – 127 (0.06 – 5.0)	•	•		•					•	•						T92015633	2.25 (red)	12.7 (1/2)	15.9 (5/8)
	•	•		•					•		•					T92015634			
	•	•		•						•		•				T92015635			
	•	•		•							•	•				T92015636			
	•	•		•					•	•				•		T92015637			
	•	•		•						•		•		•		T92015638			
1.5 – 51 (0.06 – 2.0)					•	•	•		•	•						T92015641	5.0 (green)	4.8 (3/16)	6.4 (1/4)
					•	•	•		•		•					T92015642			
					•	•	•				•	•				T92015644			
1.0 – 152 (0.04 – 6.0)					•	•	•		•	•						T92015645	5.0 (green)	6.4 (1/4)	9.5 (3/8)
					•	•	•		•		•					T92015646			
					•	•	•			•		•				T92015647			
					•	•	•				•	•				T92015648			
					•	•	•		•	•				•		T92015655			
					•	•	•			•		•		•		T92015656			
1.3 – 508 (0.05 – 20.00)					•	•	•		•	•						T92015657	5.0 (green)	12.7 (1/2)	15.9 (5/8)
					•	•	•		•		•					T92015658			
					•	•	•			•		•				T92015659			
					•	•	•				•	•				T92015660			
					•	•	•		•	•				•		T92015661			
					•	•	•			•		•		•		T92015662			
1.0 – 152 (0.04 – 6.0)					•	•	•	•	•	•					•	T92015663	7.5 (grey)	6.4 (1/4)	9.5 (3/8)
					•	•	•	•	•		•				•	T92015664			
					•	•	•	•		•		•			•	T92015665			
					•	•	•	•			•	•			•	T92015666			
0.6 – 152 (0.025 – 6.0)					•	•	•	•	•	•				•		T92015667	7.5 (blue)	6.4 1/4	9.5 3/8
					•	•	•	•	•		•			•		T92015668			
					•	•	•	•		•		•		•		T92015669			
					•	•	•	•			•	•		•		T92015670			
1.0 – 152 (0.04 – 6.0)					•			•	•	•						T92015671	10.0 (white)	6.4 (1/4)	9.5 (3/8)
					•			•	•		•					T92015672			
					•			•		•		•				T92015673			
					•			•			•	•				T92015674			
1.5 – 254 (0.06 – 10.0)					•			•	•	•						T92015676	10.0 (white)	12.7 (1/2)	15.9 (5/8)
					•			•	•		•					T92015677			
					•			•		•		•				T92015678			
					•			•			•	•				T92015679			

Elcometer 207 Precision Ultrasonic Gauges

The Elcometer 207 series of Precision Ultrasonic Thickness Gauges are designed to provide accurate measurements on thin materials.

Using the latest transducer designs - the single element delay tip transducer - the Elcometer 207 gauges will measure thin materials in "Echo-to-Echo Mode" and then automatically switch to "Interface-to-Echo Mode" when measuring thicker materials and plastics. Furthermore, the Elcometer 207's Echo-to-Echo Mode offers the user the ability to measure the material thickness WITHOUT removing the paint or coating.

All Elcometer 207 and 207DL Gauges now have a new operating mode, the PLAS Mode. This mode has been specifically designed to provide accurate readings when measuring thin plastics.

- Two calibration options - Speed of sound, Calibration to a known thickness.
- Backlight display on both versions.
- Data output available on both versions.
- 1000 reading memory in up to 10 batches (Elcometer 207DL only).
- EDTS+ Excel Link supplied free of charge with the Elcometer 207DL.
- Can be used with EDCS+ Thickness Management Software (see page 146).

Maximum Measurement Range	0.15-25.4mm (0.006-1.00") steel
Velocity Range	1250-10000m/s (0.0492-0.3937in/µs)
Accuracy	±0.002mm (±0.0001") – depends on material and conditions
Resolution	±0.002mm (±0.0001")
Units	millimetres and inches
Operating Temperature	-30 to 50°C (-20 to 120°F)
Keypad	Sealed Membrane
Display	$4^{1}/_{2}$ Digit Liquid Crystal Display with Backlight
Transducer	Each unit is supplied with 15MHz, 6mm ($^{1}/_{4}$") microdot right angle transducer
Power	AA 1.5V Alkaline or 1.2V NiCad cell
Battery Life	200hrs Alkaline (120hrs NiCad)
Weight	295g (10oz)
Size	63.5 x 114.3 x 31.5mm (2.5 x 4.5 x 1.24")
Case	Extruded aluminium

	Elcometer 207	Elcometer 207DL
Interface-to-Echo Mode	•	•
Echo-to-Echo Mode	•	•
PLAS† Mode	•	•
High Speed Scan Mode	•	•
Differential Mode	•	•
Alarm Mode	•	•
Data Output	•	•
Data-Logging		•
EDTS+ Excel link Software	○	•
EDCS+ Software	○	○
Part Number	C207----1	C207DL----1
Accessories	Transducer Delay Line (for PLAS Mode)	T92016871
	Ultrasonic Couplant (160ml)	T92015701

• = Included   ○ = Optional   For an explanation of these options see page 96

†To use the PLAS Mode, a special Graphite Delay Line is required which must be ordered separately, Part Number T92016871.

ELCOMETER 207 AND 207DL PRECISION ULTRASONIC TRANSDUCER																			
Measurement Range in steel mm (inches)	Material								Probe Type							Part Number	Frequency MHz (Colour Code)	Crystal Diameter mm (inches)	Wearface Diameter mm (inches)
	Cast Iron	Plastic	Glass Fibre	Thin Glass Fibre	Steels	Glass	Thin Plastic	Aluminium	Potted	Straight Probe	Right Angle Probe	Microdot	High Temp. (340°C/650°F)	Extra Resolution	Exxon Specification				
0.15-25.4 (0.006-1.0)	•	•			•	•	•	•			•	•				T92016526	15.0 (green)	6.35 ($^1/_4$)	7.42 ($^5/_{16}$)

The Elcometer Ultrasonic Thickness Gauge Features Explained

Interface-to-Echo Mode	In interface-to-echo mode, the gauge can take readings on thicker plastics and other materials between 1.65mm and 25.4mm (0.065 to 1").
Echo-to-Echo Mode	Measurements can be taken on materials as thin as 0.15mm (0.006inches). In echo-to-echo mode, the user can take measurements on pre-coated materials without having to remove the coating prior to measurement i.e. the gauge ignores the coating thickness.
High Speed Scan Mode	Identifies the minimum thickness point over a large area by moving the transducer over the surface. While the transducer is in contact with the material being measured, the smallest value is held in memory and displayed when scanning is complete.
PLAS Mode	Specifically for use when measuring thin plastics. Please note that to use this mode, a special Graphite Delay Line must be purchased, Part Number T92016871.
Differential Mode	Displays the positive or negative difference between a pre-set nominal (target) thickness value and the actual measured value.
Alarm Mode	Allows the user to set a target so that an audible and visual alarm operates when taking measurements. If the measurement falls below a pre-set nominal (target) value a red LED will light and the bleeper sounds. A green LED will light to indicate an acceptable thickness.
Data Output	Allows the user to send data direct to a printer or PC.
Data-Logging	A storage capacity of 1000 measurements – 10 files consisting of 100 sequential storage locations. Allows the user to send data direct to a printer or PC.
EDTS+ Excel Link Software	PC data transfer utility including generator of ASCII files and "data drop" add in for Microsoft Excel™ spreadsheets.
EDCS+ Software	Stand alone data management program with advance facilities for archiving, reporting, analysis and data export – see page 146.

Surface Profile

The proper and effective preparation of a surface prior to coating is essential. Making sure that the correct roughness – or profile – has been generated is essential.

If the profile is too low, the adhesion of the coating to the surface will be reduced. Too high and there is the danger that the profile peaks will remain uncoated – allowing rust spots to occur.

Elcometer 123 Surface Profile Gauge

This is an easy to use gauge that measures the peak-to-valley height of a blast cleaned surface.

The average of a series of measurements provides an indication of the surface roughness and allows the surfaces to be compared as blasting proceeds.

- Simple and low cost
- Metric and Imperial versions

Can be used in accordance with:	
ASTM D 4417-B	SABS 772

Elcometer 223 Digital Surface Profile Gauge

The Elcometer 223 is a battery operated Digital Surface Profile Gauge which measures the peak-to-valley height of a surface in a similar way to the Elcometer 123 analogue equivalent, but with the added benefit of a direct RS232 output.

- RS232 output - for direct transfer of readings to a PC, datalogger, printer etc - providing a permanent record of your test results – *no memory in gauge*
- Metric and Imperial switchable
- Increased resolution

Can be used in accordance with:	
ASTM D 4417-B	SABS 772

	Elcometer 123		Elcometer 223	
Range	0 - 1000mm 0 - 40mils		0 - 1000mm 0 - 40mils	
Scale Resolution	2mm 0.1mils		1mm 0.1mils	
Dimensions (nominal)	105 x 55 x 25mm 4.1 x 2.2 x 1"		105 x 55 x 25mm 4.1 x 2.2 x 1"	
Weight	235g 8oz		365g 9oz	
Power	Not Required		3V Lithium CR2032 Battery	
Part Number	Metric	Imperial	E223----2 Elcometer 223 units are switchable	
	E123A--M-	E123A--E-		
Accessories	-		Miniprinter including printer lead	X2239964B
	-		Printer lead	T22312213

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Elcometer 101 Scale 45 Roughness Gauge

Whereas comparators allow the estimation of surface roughness by both touch and sight, the Elcometer 101 estimates the roughness of iron and steel surfaces.

Its scale indicates the suitability of the surface for paints, metal coatings and hard metal coatings.

- No batteries required
- Simple and easy to use

Scale (Divisions: 0-10)	*Blue Band:* Indicates surface is generally accepted as suitable for painting		
	Yellow Band: Indicates the surface is suitable for sprayed metal coatings		
	Red Band: Indicates the surface is suitable for hard sprayed metal coatings		
Dimensions	90 x 5 x 25mm (3.5 x 2 x 1")	Weight	185g (6oz)
Part Number	A101A-45A		

Elcometer 122 Testex Replica Tape

Whereas comparators allow the estimation of surface roughness by both touch and sight, the Elcometer 122 Testex Tape allows the user to measure the peak-to-valley height of the profile and record it.

Elcometer 122 Testex Tape consists of foam with a non-compressible backing. The foam side is rubbed into the surface providing a permanent mould of the profile.

The Elcometer 124 Thickness Gauge is then used to measure the peak-to-valley height of the profile formed in Elcometer 122 Testex Tape.

The Testex Tape range is available in four profile ranges. It is important that the tape grade chosen is reflective of the profile under measurement.

Can be used in accordance with:	
ASTM D 4417-C	ISO DIS 8503-3

Dimensions		19 x 54mm test area	(0.75 x 2.13")	Number of Tests	50 per roll
		Elcometer 122 Coarse	Elcometer 122 X-Coarse	Elcometer 122 X-Coarse Plus	Elcometer 122 Paint Grade
Range	Metric	20-50μm	40-115μm	20-200μm	33-85μm
	Imperial	0.8-2.0mils	1.5-4.5mils	1.5-8.0mils	1.3-3.3mils
Part Number		E122----B	E122----C	E122----F	E122----D

Elcometer 124 Thickness Gauge

The Elcometer 124 Thickness Gauge issued to measure the peak-to-valley height of a surface profile formed in the Elcometer 122 Testex Tape.

- Available in both metric and imperial versions
- Low cost, quick and easy to use

Can be used in accordance with:	
ASTM D 4417-C	NACE RP 0287-95

Range	Metric: 0-10mm Imperial: 0.4"	Scale resolution	2μm (0.1mils)
Dimensions	110 x 100 x 15mm (4.3 x 3.9 x 0.6")	Weight	260g (9oz)
Part Number	Metric: E124---3M	Imperial: E124---3E	

Elcometer 125 Surface Comparator

Comparators allow the estimation of surface roughness by both touch and sight.

- Available in both grit and shot
- Metric units only

Can be used in accordance with:	
ASTM D 4417 Method A	ISO 8503-1
ISO 8503-2	

	Grit	Shot
Section Profiles	25, 60, 100, 150µm	25, 40, 70, 100µm
Part Number	E125----1	E125----2

Elcometer 129 Rubert & Rugotest Surface Comparators

Comparators allow the estimation of surface roughness by both touch and sight.

The Elcometer 129 Rubert Comparators are available in two models:

- The Elcometer 129 Rubert - available in grit and shot versions
- The Elcometer 129 Rugotest - includes the shot and grit profiles on the same block
- Available in metric units only
- Roughness is displayed on both classes and groups for easier identification

Can be used in accordance with:
ASTM D 4417 Method A

	Elcometer 129/1 Rubert Grit Elcometer	129/2 Rubert Shot Elcometer	129/3 Rugotest Shot and Grit
Section Profiles	0.4, 0.8, 1.6, 3.2, 6.3 and 12.5µm	0.4, 0.8, 1.6, 3.2, 6.3 and 12.5µm	N6, N7, N8, N9, N10 and N11 equivalent to 0.8, 1.6, 3.2, 6.3, 12.5 and 25µm roughness averages respectively
Part Number	E129----1	E129----2	E129----3

Elcometer 127 Keane-Tator Surface Comparator & Magnifier

Comparators allow the estimation of surface roughness by both touch and sight.

- Three versions: sand, shot and grit
- Five different grades of roughness in each comparator
- Designed to be used with the Elcometer 127 illuminated magnifier
- Available in Imperial units only

Can be used in accordance with:
ASTM D 4417 Method A

Profile Disc	Sand	Grit	Shot
Section Profiles	0.5, 1, 2, 3, 4mils	0.5, 1, 2, 3, 4mils	0.5, 1, 2, 3, 4mils
Part Number	E127----2	E127----3	E127----4
	Surface Profile Disc Holder and x5 Magnifier		E127----1

Surface Profile

Elcometer 133 Ships Propeller Roughness Comparators

Comparators allow the estimation of surface roughness by both touch and sight. The Elcometer 133 Ships Propeller Roughness Comparators have been developed for the specific profiles related to the condition of ships propellers over the life of the propeller. Comparators are also supplied with guidance on the report for Propeller Blades.

Two versions are available, one for above water (dry dock) inspection and another for inspection work carried out underwater.

Nominal Profiles	Surface Comparator	Underwater Comparator
Ra	1, 2, 4, 8, 16, 30µm	1, 2, 4, 8, 16, 30µm
Rs	6, 12, 24, 48, 96, 180µm	6, 12, 24, 48, 96, 180µm
Part Number	H133--15A	H133--16A

Elcometer 119 Pipe Pit Gauge

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

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

The gauge shows the pit depth compared to the nominal pipe wall thickness.
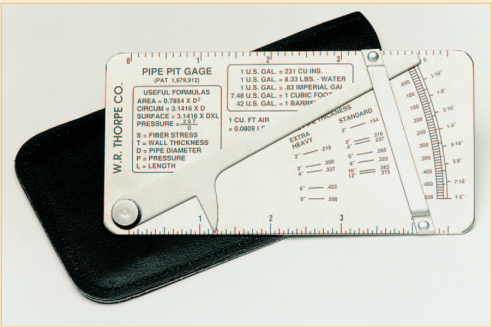
Range	0-500mils	Dimensions	68.3 x 133.3 x 4.8mm (21.06 x 5.25 x 0.18")
Graduation	$^1/_{16}$" and 10mils	Weight	227g (8oz)
Part Number			E119-----

Elcometer 7060 SURFTEST SJ-201 Roughness Tester

A portable device operating on the inductive principle to measure the roughness of a wide variety of surfaces.

This instrument consists of a processing unit with a digital display of the current parameters and a mobile measurement head which is fitted with a retractable diamond stylus sensor, (5µm/0.2mils radius), and has a working load of 4mN.

The roughness profiles are determined by motorised travel of the sensor over the surface to be tested.

Each unit is supplied with a roughness reference standard, case, tools and mains adapter.

Parameters available include:

- A1, A2, mr, Mr1, Mr2, Pc, Ra, Rp, Rpk, Rq, Rvk, Rt, Ry, Rz, R3z, S and Sm.

FEATURES
• RS232 output for statistics printer or PC
• Working range: Ra 0.01 to 75µm (0 to 3mils), Ry/Rz 0.02 to 300µm (0 to 12mils)
• Cut-off lengths: 0.25, 0.8, 2.5mm (0.01, 0.03, 0.1")
• Sampling lengths: 1x, 3x, 5x

Model	Description	Part Number
Elcometer 7060	Elcometer 7060 SURFTEST SJ-201 Roughness Tester	K0007060M003

Elcometer 7060/4 SURFTEST SJ-301 Roughness Tester

The new generation, high performance roughness unit, working on the same principle as the Elcometer 7060 but fitted with a built-in printer and a large LCD touch panel for numeric/graphic display and settings.

Each unit is supplied with standard sensor and accessories, AC adapter and roughness specimen.

Parameters available include:

- Ra, Ry, Rz, Rt, Rq, Rv, Sm, S, Pc, R3z, mr, Rpk, Rvk, ó c, Rk, Mr1, Mr2, Lo, Ppi, R, AR, Rx, A1, A2.
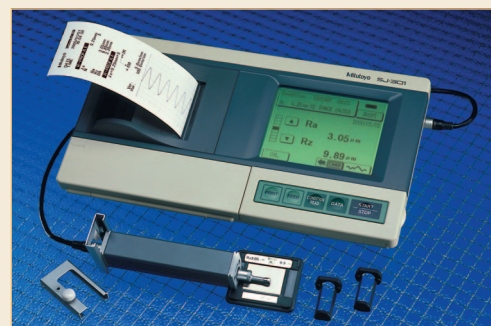
FEATURES
• Analysis graphs: BAC1, BAC 2, ADC
• Working range: Ra 0.01 to 75µm (0 to 3mils), Ry/ Rz 0.02 to 300µm (0 to 12mils)
• Cut-off lengths: 0.25, 0.8, 2.5, 8mm (0.01, 0.03, 0.1, 0.31")
• Sampling: 1x, 3x, 5x Digital filter and recording magnification
• Statistics: minimum, maximum, standard deviation, pass ratio, frequency distribution
• Adjustable limits
• RS232 output to statistical printer or PC

Model	Description	Part Number		
		UK 240	EUR 220	US 110
Elcometer 7060/4	Elcometer 7060/4 SURFTEST SJ-301 Roughness Tester	K0UK7060M002	K0007060M002	K0US7060M002

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Material Thickness
see pages 91-96

Adhesion
see pages 153-163

Inspection Accessories
see pages 174-176

Inspection Kits
see page 171

Multiplexers
see pages 193-196

Publications
see pages 172-173

Surface Cleanliness

Surface contamination from salts such as chlorides, sulphates and nitrates have been shown to lead to blistering of organic coatings, particularly in immersion conditions.

It is not sufficient to measure the cleanliness of the substrate. In a multi-layer coating process, it is necessary to monitor and record the cleanliness of each layer prior to applying the next coating. When using amine cured epoxy coatings, for example, in low ambient temperatures or in high humidity, a surface oiliness or exudate may cause inter-coating adhesion failure.

Elcometer 130 SCM400 Salt Contamination Meter

Soluble salts on a surface are absorbed into a special filter paper soaked with distilled water. The Elcometer 130 measures the conductivity of the wet paper, calculates the salt level and displays it in ugcm^{-2}.

- Suitable for a wide range of shapes, orientations, surfaces and finishes
- Quick and simple to use
- Battery operated and portable
- Confirms adequate cleaning of surfaces before coating, aiding the prevention of premature coating failure
- Shows salt build-up on vulnerable surfaces, which can then be cleaned to increase the lifetime of a coating
- Test papers can be re-moistened and a similar test result can be achieved - ideal for proof and ISO requirements
- Accurate
- Repeatable
- Reproducible

Each instrument is supplied in a convenient light weight carrying case and includes:

- 100 High Purity Sample Papers
- 250ml Pure Water
- 8 Replacement Plate Support Pads

- 20 PVC Storage Bags
- Disposable Gloves Battery
- Tissues

- 3 x 2ml Syringes
- Plastic Tweezers

Range	0.1-20μg cm^{-2}
Resolution	0.1μg cm^{-2}
Accuracy	±1%
Operating Range	5 to 40ºC (41 to 104ºF) <80% RH
Power Supply	9V Battery 6LR61 (MN1604)
Sampling Time	2 minutes
Sampling Size	11cm (4.3") circle or part of this
Weight	1.5kg (3.3lbs)
Dimensions (nominal) instrument only	200 x 190 x 60mm (7.9 x 7.5 x 2.4")
Number of tests before battery change	approximately 500 measurements

Model	Description	Part Number
Elcometer 130	Elcometer 130 Salt Contamination Meter	E130----1
Accessories	250ml Pure Water	T13011344
	100 High Purity Sample Papers	T1304469-
	Medical Wipes (1 Pack)	T1304472-

Elcometer 134A Chloride Ion Test Kit for Abrasives

Chlorides deposited on a surface by contaminated abrasive during blasting can cause a coating to fail prematurely. Contamination can build up, particularly if the blast media is recycled several times.

The Elcometer 134A is an easy to use, accurate field test which determines if your abrasive is contaminated with chlorides and thus prevent costly surface-related failures.

Chloride Ion testing is achieved quickly and accurately using a novel extraction method, based on the CHLOR*EXTRACT™ solution.

Can be used in accordance with:	
BS EN ISO 11127-6	BS EN ISO 11127-7
BS 7079-F16	BS 7079-F17

Elcometer 134S Salt Detection Kit for Blast Cleaned Surfaces

Chloride Salts left on the surface before the first coat is applied can result in the coating system being forced off the surface by corrosion or blistering before the full life of the coating has been reached.

To ensure that the chloride has been removed it is essential that the surface is tested before the coating is applied.

Can be used in accordance with:	
ISO 8502-6	ISO DIS 8502-9

Elcometer 134W Chloride Ion Test Kit for Water/Liquids

Coatings can fail due to chlorides being deposited on a surface by contaminated water during pressure washing, UHP water jetting or wet abrasive blasting.

The Elcometer 134W is an easy to use, accurate, field based test which determines if your wash water is contaminated with chlorides and thus prevent costly surface coating failures. It can also be used to monitor the recycled water (after it has been applied) to establish how effectively salt removal is occurring.

	Elcometer 134A	Elcometer 134S	Elcometer 134W
Measuring Range	1-50ppm (μg/cm^2)	1-50ppm (μg/cm^2)	10-2000ppm (μg/cm^2)
Scale Resolution	1ppm	1ppm	10ppm
Sampling Time	1.5 minutes	1.5 minutes	1.5-4 minutes
Tests per Box	4	5	5
Colour Change	Pink to White	Pink to White	Pink to White
Storage Conditions	25ºC (77ºF)	25ºC (77ºF)	25ºC (77ºF)
Kit Weight	367g (13oz)	250g (9oz)	208g (7oz)
Kit Dimensions	185 x 125 x 110mm (7 x 5 x 4.5")	185 x 125 x 110mm (7 x 5 x 4.5")	185 x 125 x 110mm (7 x 5 x 4.5")
Part Number	E134----2	E134----1	E134----3

The Elcometer 134 units do not require the use of needles or contain mercury.

Elcometer 134 CSN – Chlorides, Sulphates & Nitrates

Designed to accurately measure surface chloride, sulphate and nitrate ions in minutes, the Elcometer 134 'CSN Salts' offers the user the ability of trouble-free testing in the field.

- All the components of the Elcometer CSN Test Kit are pre-measured and pre-dosed for complete accuracy.
- All results are recorded in parts per million (ppm) - no complicated calculations needed to transfer these to μgcm^{-2} as the tests of the Elcometer 134 CSN are designed to use a ratio of 1:1.

Supplied in an ABS plastic carrying case for easy portability around the site, each field kit is supplied with full instructions attached to the inside lid, together with:

- 5 x Chloride Tests
- 5 x Tests, together with 1 x Colorimeter, for Sulphate Testing
- 5 x Nitrate Test Strips
- 5 x Syringes (without needles)

All Elcometer 134CSN consumables can be replenished.

Can be used in accordance with:	
ISO 8502-5, 8502-11	NACE 6G186
SSPC SP TU 4	

Model	Description	Part Number
Elcometer 134	C5N Elcometer 134 Chloride, Sulphate, Nitrate Test Kit – 5 tests	E134-CSN
Accessories	1 set of 5 Chloride Tests	T134---C
	Complete Refill Kit – fully refill your test kit with 5 tests for each ion	T134-KIT

Elcometer 138 Bresle Kit & Patches

It is essential that the level of contaminants on a surface is measured prior to application 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.

Each kit is supplied in a plastic carrying case complete with:

Horiba B-173 Conductivity Meter and Calibration Solutions, 25 Test Patches, 1 x 250ml Pure Water, 3 x 5ml Syringes and Needles, 30ml Measurement Beaker, 1 x 50ml bottle of Acetone and 2 x Sponges to wipe excess liquid.

Can be used in accordance with:	
ISO 8502-6	ISO 8502-9

Model	Description	Part Number
Elcometer 138	Elcometer 138 Bresle Conductivity Kit	E138----1
Accessories	1 box of 25 Bresle Patches	E135---B
	1 x 250ml Pure Water	T13011344
	3 x 5ml Syringe (without needles)	T13818517
	3 x Needles	T13818518
	1 x 30ml Beaker	T13818519
	1 x 50ml Acetone	T13818520
	2 x Sponges	T13818521
	Replacement Horiba B-173 Conductivity Meter	T13818515
	Conductivity Calibration Solutions for Horiba B-173	T13818516

Elcometer 139 ABC Amine Blush Check

When using amine-cured epoxy resin coatings in a multi layer system, if the original coating cures in a low ambient temperature or in a high humidity environment, a surface oiliness or exudate may occur.

"Amine Blush" or "Sweating" as it is commonly referred to, leads to inter-coat adhesion failure.

- Easy to use
  - Spray the ABC solution onto a test filter pad and apply to the surface.
  - Check for colour change if amine is present.
  - After test, flush with clean, fresh water.
- Immediate result if amine blush is present.
- Each kit is suitable for 75[+] tests.

Each unit is supplied in a carrying case for easy transportaion to the site and comes complete with:

| ABC Solution | Test Filter Pads | Protective Gloves | Sealable Sample Bags |

Model	Description	Part Number
Elcometer 139	Elcometer 139 ABC Amine Blush Check	E139----1

Elcometer 128 Pictorial Surface Standards

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

They include:

- The Swedish Standard - ISO 8501, SIS 055900
- The British Standard - BS 7079: Part A1
- The SSPC Standard - VIS 1-01
- The SSPC Standard - VIS-3

Can be used in accordance with:	
ASTM D 2200	BS 7079-A1
ISO 8501-1	SSPC-VIS 1-01

Model	Description	Part Number
Elcometer 128/1	Swedish Standard (ISO 8501, SIS 055900) - The original visual standard. It shows the degree of cleanliness of four different levels of rusted steel cleaned by blasting, hand and power tools and flame. Specified by ASTM 2200 Method A.	E128----1
Elcometer 128/2	British Standard BS 7079: Part A1 - Consists of ISO 8501 and a supplement for cleaning using six alternatives to silica quartz, which is prohibited in Britain.	E128----2
Elcometer 128/3	SSPC (Steel Structures Painting Council) VIS 1-01 - Similar to the Swedish and British standards, but the pictures of the required final appearances match the written descriptions in the USA standards. VIS 1-89 includes photographs of surfaces cleaned using metallic and non-metallic abrasives. Specified by ASTM 2200 Method B.	E128----3
Elcometer 128/4	British Standard BS 7079: Part A1 Supplement – Supplied with E128----2	E128----4
Elcometer 128/5	SSPC VIS-3 - Contains 44 photographs to supplement the written SSPC specifications for hand and power-tool cleaning.	E128----5

Climatic Condition Testing

During the application of a coating, the presence of moisture in the environment or on the work surface, often results in a poor quality finish. Problems such as poor adhesion of the coating or premature corrosion of the substrate can occur.

To determine the likelihood of moisture affecting the quality of the finish, it is essential that the surface temperature, air temperature, relative humidity (RH) and dewpoint are all measured.

Elcometer 116 Whirling & Sling Hygrometer

The Elcometer 116A Whirling Hygrometer is available in either a °C or °F scale.

A guide for Relative Humidity (RH) Calculation is supplied with each instrument. The dewpoint can be accurately obtained using Elcometer 114 Dewpoint Calculator.

The Elcometer 116C Bacharach Sling Hygrometer is a convenient, self contained instrument with a built in slide rule for the calculation of %RH and dewpoint. It has spirit filled thermometers and is also available in °C or °F scales.

- Lightweight and compact
- Manual operation – no power supply required
- Measuring range: –5 to 50°C (30 to 110°F)
- RH Accuracy: ±5%RH

Can be used in accordance with:	
ASTM E 337-B	BS 2842

Model	Description	Part Number
Elcometer 116A	Whirling Hygrometer - Metric °C	G116A---1
Elcometer 116C	Bacharach Sling Hygrometer - Metric °C	G116C----1
	Bacharach Sling Hygrometer - Imperial °F	G116C----2

Elcometer 114 Dewpoint Calculator

This provides accurate values of Relative Dewpoint (RH) and Humidity from the wet and dry bulb temperatures measured by a Whirling or Sling Hygrometer - such as the Elcometer 116 range above.

The range of the Elcometer 114 is -10°C to 50°C and it has an accuracy of ±1% of standard tables.

The calculator includes a °C to °F converter.
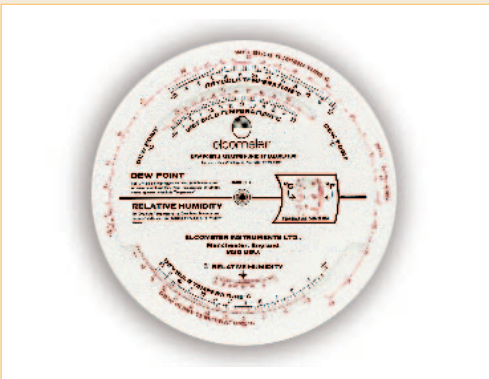
Model	Description	Part Number
Elcometer 114	Elcometer 114 Dewpoint Calculator	G114----2

Elcometer 319 Dewpoint Meter – Dewmeter

The Elcometer 319 has been designed to incorporate all the needs required for climate condition monitoring, in a single gauge.

- Air Temperature
- Relative Humidity
- Surface Temperature
- Dewpoint Temperature
- ΔT – The difference between dewpoint and surface temperature

Accessories available for the Elcometer 319 include:

- Interface Cable and EDTS⁺ Excel Link Software to download your stored measurements for further PC analysis
- Infrared Printer for direct print-out of each dataset
- Liquid Temperature Probe for measuring liquids up to 300ºC/ 572ºF

Can be used in accordance with:	
BS 7079-B4	ISO 8502-4
NACE RP propo 97	

Alarm	Indicating when the climatic conditions are 'unsafe' to paint
Memory	Each Elcometer 319 can store features up to 99 datasets* in the internal memory
Date and Time	Each dataset is stored with date and time stamps. Date and time can also be displayed on the screen
IR Output	Direct infrared output to IR Printer
Cable Data Output	All gauges are supplied with data output via a cable for linking directly to a PC (Note: Interface Cable and Software supplied separately, Part Number T31916504)
Backlight	To measure in low light and darkened areas, switch on the backlight
Dataset Reading Review	See all the readings stored in the memory on the screen
Enhanced Resolution	Two scale ranges, which automatically change dependent upon the readings, provides greater reading resolution and accuracy below 60ºC (140ºF)
Improved Durability	A specially designed resilient case provides greater protection
Increased Accuracy and Stability	Made by Rotronic® of Switzerland, the humidity sensor is now perhaps the most stable and accurate available
Fast Surface Probe	Users can take more readings in less time with the rapid contact sensor

*A dataset is one set of each of the readings i.e. air temperature, surface temperature relative humidity dewpoint and ΔT.

	Metric	Imperial
Air Temperature Range	-20 to 75ºC	-4 to 167ºF
Air Temperature Accuracy	±0.3ºC	±0.6ºF
Resolution	0.1ºC	0.1ºF
Surface Temperature Range	-15 to 115ºC	5 to 239ºF
Surface Temperature Range 1	-30 to 60ºC	-22 to 140ºF
Surface Temperature Range 1 Accuracy	±0.5ºC	±1.0ºF
Surface Temperature Range 1 Resolution	0.1ºC	0.1ºF
Surface Temperature Range 2*	60 to 300ºC	140 to 572ºF
Surface Temperature Range 2 Accuracy	1.5ºC	±3.0ºF
Surface Temperature Range 2 Resolution	1ºC	1ºF
Relative Humidity Range	0 to 100% RH	0 to 100% RH
Relative Humidity Accuracy	±3% RH	±3% RH
Relative Humidity Resolution	0.1% RH	0.1% RH
Weight	260g	0.57lb
Battery Type	3 x AA MN1500 LR6 Batteries	
Battery Life	500[+] hours (without use of the backlight)	

*The Elcometer 319 automatically switches between ranges for increased resolution at lower temperatures.

Model	Description	Part Number
Elcometer 319	Elcometer 319 Dewmeter	G319----1
Accessories	Liquid Temperature Probe	T31916465
	Surface Temperature Probe	T31916466
	EDTS[+] Excel Link® Software and Interface Cable	T31916504
	IR Printer	X99913877

EDCS[+] Management Software
see page 146

Amine Blush Check
see page 106

elcometer

Elcometer 7410 Hygrometer Polymeter

This simple device monitors ambient conditions.

The Elcometer 7410 indicates the temperature from -30° to +50°C (-22° to 122°F), and relative humidity (from 0 to 100% RH), using the hair technique.
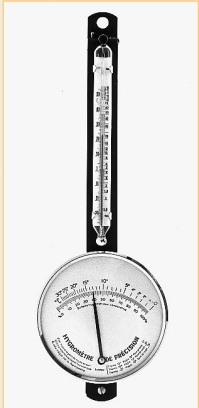
Model	Description	Part Number
Elcometer 7410	Hygrometer Polymeter	K0007410M001
Accessories	Spare Thermometer	KT007410P001

Elcometer 6700 Electronic Thermo-Hygrograph

A portable laboratory instrument which records the ambient temperature from −15° to $^+$40°C (5° to 104°F) and relative humidity (0 to 100% RH) using the hair method.

- Indication recorded on a paper diagram.
- Push-button selection of five time ranges: 1, 7, 31, 62 and 93 days.
- Quartz movement.
- Battery operated.

Model	Description	Part Number
Elcometer 6700	Electronic Thermo-Hygrograph	K0006700M001
Accessories	1 day diagrams - 400 sheets	KT006700N001
	7 day diagrams - 100 sheets	KT006700N003
	31 day diagrams	KT006700N005
	Spare Pen for Thermo Hygrograph	KT006700P001

Elcometer 113 Magnetic Thermometer

The Elcometer 113 Magnetic Thermometer indicates the surface temperature of steel and other magnetic materials continuously.

The thermometer is based on a bimetallic strip and therefore does not require batteries. It is available in four scale ranges.
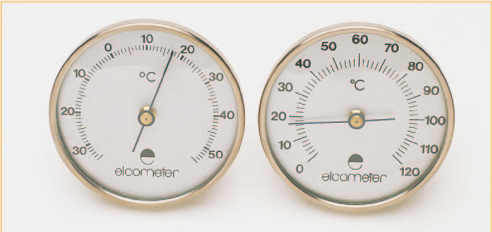
Model	Description	Scale Range	Part Number
Elcometer 113/1	Elcometer 113 Magnetic Thermometer – metric	-35 to 55°C	G113----1
Elcometer 113/2	Elcometer 113 Magnetic Thermometer – metric	0 to 120°C	G113----2
Elcometer 113/3	Elcometer 113 Magnetic Thermometer – metric	-20 to 250°C	G113----3
Elcometer 113/4	Elcometer 113 Magnetic Thermometer – imperial	0 to 500°F	G113----4

Elcometer 212 Digital Pocket Thermometer

Designed to cope with routine day to day use, the Elcometer 212 is the gauge to take fast, accurate measurements. Incorporating an auto-power on/off facility, by simply unfolding and folding the probe, the instrument switches on and off.

- Large easy to read display
- Surface or Needle/Liquid probe options available
- Auto power on/off facility
- °C or °F options available
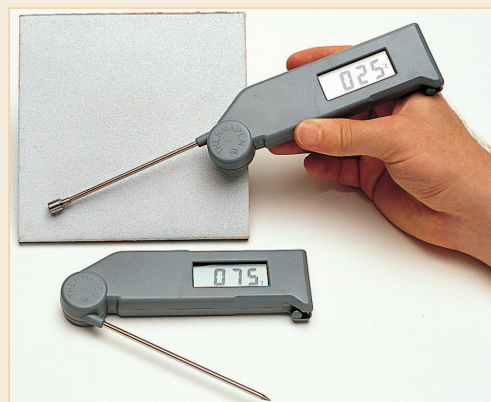
	°C Scale (with Needle or Surface Probe)	°F Scale (with Needle or Surface Probe)
Temperature Range	-50 to 300ºC	-50 to 562ºF
Resolution	1ºC	1ºF
Accuracy	±1% of the reading ±1ºC	±1% of the reading ±2ºF
Ambient Temperature Range	0 to 50ºC	0 to 122ºF
Display	12.7mm Liquid Crystal Display	0.5" Liquid Crystal Display
Battery Type	12V MN21 Battery	
Battery Life	Approximately 200 hours	
Auto Switch Off Time	Approximately 5 minutes	
Case Dimensions	47 x 156 x 19mm	1.9 x 6.2 x 0.7"
Probe Dimensions	110mm	4.3"
Instrument Weight	100g	0.22lb

Model	Description	Part Number
Elcometer 212/1	Digital Pocket Thermometer (ºC) with Needle/Liquid Probe	G212----1
Elcometer 212/3	Digital Pocket Thermometer (ºF) with Needle/Liquid Probe	G212----3
Elcometer 212/2	Digital Pocket Thermometer (ºC) with Surface Probe	G212----2
Elcometer 212/4	Digital Pocket Thermometer (ºF) with Surface Probe	G212----4

Elcometer 213 Digital Thermometer

The Elcometer 213 Digital Thermometer allows quick and easy measurements for a wide range of applications using the K-type thermocouple:

- Elcometer 213/1: Measurement of surface and air temperatures
- Elcometer 213/2: Measurement of liquid temperatures
- Elcometer 213/3: Needle probe for soft material temperatures
- Measures temperature in the range of -50°C to 850°C, (the maximum temperature is dependent on probe type), with high accuracy and resolution. Quick temperature response.

	Elcometer 213/1	Elcometer 213/2	Elcometer 213/3
Operating Range	-50 to 600ºC	-50 to 1100ºC (850ºC maximum for unit)	-50 to 400ºC
Accuracy	±1% of the reading ±1 digit	±1% of the reading ±1 digit	±1% of the reading ±1 digit
Time Constant	~ 1 second	~ 1 second	~ 1 second
Ambient Temperature	0 to 50ºC		
Instrument Display Range	-50 to 850ºC		
Weight	200g (0.44lb)		
Power Supply	1 x 6F22 (9V) Battery		

Model	Description	Part Number
Elcometer 213/1	Elcometer 213 Digital Thermometer with Surface and Magnetic Probe	G213--M1B
Elcometer 213/2	Elcometer 213 Digital Thermometer with Liquid Probe	G213--M2B
Elcometer 213/3	Elcometer 213 Digital Thermometer with Needle Probe	G213--M3B

Elcometer 214 Infrared Digital Thermometer

The Elcometer 214 Infrared Digital Thermometer is a hand held battery operated instrument, which safely and accurately measures surface temperature of non reflective materials using infrared technology.

- Infrared technology allows fast, non contact temperature measurement which avoids surface contamination
- Lightweight

The Elcometer 214 Infrared Digital Thermometer has a spot ratio of 3:1. The closer you get to the object under inspection, the smaller the spot size and hence the more accurate the reading.

The diagram explaining optic (spot) ratios is shown below.
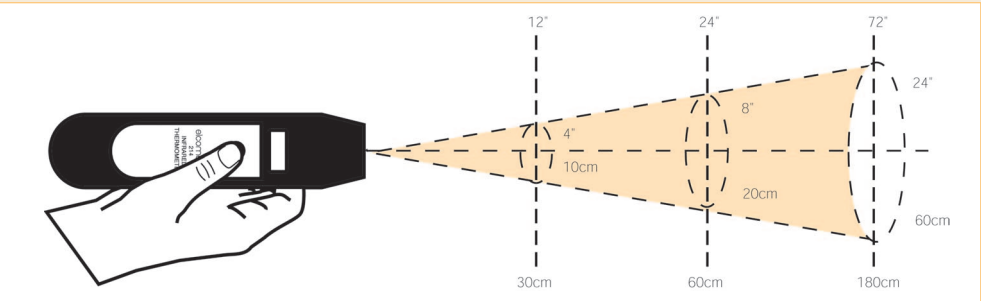
Spot ratio: 3 : 1

Temperature Range	-18 to 315ºC (0 to 600ºF)
Resolution	1ºC (1ºF)
Accuracy	±2% of reading or 2ºC (3ºF)
Ambient Temperature Range	10 to 52ºC (50 to 125ºF)
Field of View	3:1 Optics Ratio with a 25mm Minimum Target
Repeatability	±0.5% of reading ±1 digit
Emissivity	Fixed at 0.95
Response Time	1 second
Display	3 digit – 10mm Liquid Crystal Display
Battery Type	9V MN1604 Alkaline Battery
Battery Life	Approximately 100 hours
Case Dimensions	184 x 43 x 19mm (7.3 x 1.7 x 0.75")
Instrument Weight	77g (0.17lb) without battery

Model	Description	Part Number
Elcometer 214	Elcometer 214 Infrared Digital Thermometer	G214----1

Elcometer 214L Infrared Digital Thermometer (Laser)

The Elcometer 214L Infrared Thermometer is compact, lightweight and easy to use. Simply aim, pull the trigger and display the surface temperature of the object being measured. Release the trigger to hold the reading.

The Elcometer 214L incorporates a clear, easy to read display with laser pointer, backlight and low battery indicator. Battery life is preserved by the auto switch off facility and the User's ability to switch the backlight on or off as required.

The laser assisted alignment feature is useful for pinpointing the exact area of measurement.

Features include:

- Laser – switchable
- ºC/ºF – switchable
- Auto switch off

- Backlight – switchable
- Hold facility
- 8:1 Optics ratio (see diagram on page 112)

Temperature Range	-20 to 270ºC (-4 to 518ºF)
Resolution	1ºC or 1ºF
Accuracy	±2% of reading or ±2ºC (±4ºF) whichever is the greater
Field of View	8:1 optics ratio (25mm min target)
Emissivity	Fixed at 0.95
Response Time	Approximately one second
Display	Custom LCD
Battery Type	9V MN1604/PP3
Battery Life	100 hours continuous use
Case Dimensions	58 x 79 x 159mm (2.2 x 3.1 x 6.2")
Instrument Weight	180g (0.4 lb)

Model	Description	Part Number
Elcometer 214L	Elcometer 214L Infrared Digital Thermometer with Laser Pointer	G214L----2

Oven Temperature Data Recorders

Once a product has been powder coated to the required thickness, it must pass through an oven. During this baking (or stoving) process the powder melts, flows, gels and finally chemically reacts and cures. It is critical to the coating's final performance and appearance that both the temperature and the time at temperature parameters are controlled.

It is imperative not only to ensure there are no hot or cold spots within the oven, but also that the temperature of the product being coated is sufficient to meet the technical specification of the powder coating. Failure to maintain the correct temperature profile can cause problems in the final performance and durability of the coating.

Variation of the oven temperature profile between production batches may lead to changes in the final coating's gloss, adhesion and colour. This can greatly affect the product's quality and therefore could be the difference between success and failure.

Elcometer 215 Temperature Data Recorder

The Elcometer 215 is an easy to use oven temperature data recorder which can be used to measure and record the oven temperature profile.

Logging both the product's surface and the air temperature in a cure oven, the Elcometer 215 records the "Temperature Profile" and so provides the User with sufficient information to ensure the consistent quality of your coating process.

Specifically for powder coating cure ovens, wet coating cure ovens, batch ovens and conveyor ovens, the Elcometer 215's measurements, analysis and report options (fully customisable) generate tailor-made information about the curing processes.

The data logger is fitted with a large display for easy menu-driven operation and an immediate display of the measurement results.

- Maximise productivity.
- Minimise energy costs.
- No more rejects or rework.
- Optimise finishing quality.
- Document and prove your process is in control according to Qualicoat®, GSB®, ISO 9000, QIB®, etc.

Data logger features include:

- Optional add-on to convert the 6 channel data logger into a 12-channel system for more accurate temperature profiling.
- Large display for easy menu-driven operation. Simply follow the instructions on the display.
- Menus in five languages: English, French, German, Italian and Spanish.
- Five different data-evaluation methods.
- Displays the results of every stored batch, including Cure-index.
- Standard AA-batteries ensure many hours of continuous operation.
- Extended memory stores 10 batches of 25,000 measurements each.

Additional logger features for detailed results:

- Start and stop logging at a pre-set time and date.
- Start and stop logging at a pre-set temperature.
- Programmable (via PC) for up to 15 paint-types, for accurate calculation of the Cure-index.
- If a paint-type is not available in the library, it can be entered in the logger (1 type per batch).
- Variable measurement interval, date, time, C°/F°.

Simple 3-step operation for basic features:

1. Connect the probes to the product and switch the logger "on".
2. Place the logger in the box and send it through the oven.
3. Read the results from the display or send them to a printer or PC.

FLEXIBLE EVALUATION OF DATA

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

Wireless print
The optional portable infrared printer can print a brief report which includes: Cure-index, maximum temperature and graphs for immediate information review.

Logger to printer
A complete, full-colour report can be printed directly to any HP-DeskJet or PCL3 compatible printer using the optional printer-link. No computer required!

Extensive analysis
For extensive analysis, comprehensive calculations and fully customisable reports, every system is supplied with powerful "Ideal Finish" data analysis software.

IDEAL FINISH SOFTWARE AND THE ELCOMETER 215 OVEN-LOGGER

- The Elcometer 215 Oven-Logger is supplied with Ideal Finish Software and has been designed specifically for the powder cure and paint cure process. Special options make it possible to evaluate every part of the cure process and quickly judge the oven performance.

- Important information such as thermostat settings, track speed, type of paint, client data etc. can be added to print a complete quality report.

- The 'SMART-option' in the Ideal Finish software allows the User to insert the cure specifications of the powder supplier.

- The Elcometer 215 will inform you immediately after the process if the paint is sufficiently cured or if the cure process has failed.

- Saves on rework costs.

- Improves Quality.

- Connect to an IR Printer – for immediate results.

A WIDE RANGE OF TEMPERATURE PROBES ARE AVAILABLE

All Elcometer 215 probes have been especially designed to guarantee accurate readings:

- Perfect probe-surface contact.

- Low mass and optimised shape to avoid influence on temperature behaviour.

- Cable with easy to clean Teflon outer shield, highly flexible due to the twisted cable cores and extremely strong due to the braided metal mesh armour.

Magnetic surface probe
This probe is fitted with an ultra strong magnet but still has a very low mass and size. The actual sensor is thermally isolated from the magnet in order not to affect the part's temperature. This sensor is suited for use on round parts, such as tubes.

Clamp-type surface probe
Small and elegant surface probe for any type of material. Silver tipped sensor is thermally isolated from the clamp by ceramic isolator.

Ring-type surface probe
Universal probe with aluminium ring at the tip for fast response.

Air Temperature probes
Available with either clamp or magnet.

Probe-cable
Most of our standard probes are equipped with our special probe-cable. This cable is easy to clean due to the Teflon outer shield.

Each logger comes with a set of metal probe-tags to help the User match each probe with its assigned channels.

Magnetic Surface Probe

Air Temperature Probe

Surface Temperature Probe

Elcometer 215 Ideal Finish Software

Ideal Finish Software, supplied with the Elcometer 215 allows line operators to print customised reports.

Calculation functions and enhanced process files help you to make the correct decision, such as changing line speed or oven temperature.

Ideal Finish is the most advanced temperature monitoring software package available. With two user levels, "Basic" and "Advanced", Ideal Finish is an inexhaustible resource for both new and advanced Users.

View graphical representation of the oven temperature profile, displaying any selection of probe temperatures.

Insert a picture of your product. The probe position is calaculated automatically

Create and store oven settings
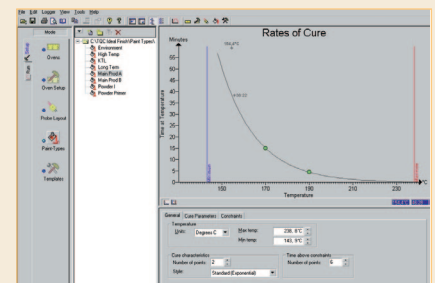
Create your own library of paint types

Accuracy	±1.0ºC (0-300ºC), ±3ºC (>300ºC) ±2.0ºF (0-570ºF), ±5ºF (>570ºF)	Memory	254,000 readings
Resolution	0.1ºC (0.2ºF)	Measuring Intervals	2 seconds to 1 hour, user selectable
Temperature Range	-50 to 1200ºC (-58 to 2190ºF)	Power Supply	3 x AA batteries
Operating temperature	0º to 60ºC	Dimensions (Logger)	105 x 86 x 30mm (4.1 x 3.4 x 1.2")
Probe Type	K type thermocouple	Number of Channels	6 (or 12 with expansion unit)
Probe Range	-50 to 300ºC (-58º to 572ºF)	Weight	300g (10.6oz)
Indicators	LCD display 126 x 64 pixels	Printing Output	infrared (HPSIR) or direct (PCL3)
Cable	2.5mm stereo jack to sub-D9	Data Output	RS 232 at 115,200 baud

Model	Description	Part Number
Elcometer 215	Elcometer 215 Oven-Logger complete with Ideal Finish Software	G215----1
Accessories	1.5m Surface Probe	T21513852
	1.5m Ring Type Surface Probe – fast response	T21518555
	1.5m Air Probe	T21513853
	1.5m Magnetic Surface Probe	T21513854
	3m Surface Probe	T21513855
	3m Ring Type Surface Probe – fast response	T21518557
	3m Magnetic Surface Probe	T21513856
	Logger to PC Interface Cable	T21518566
	PCL3 Printer-Link Convertor with Cable	T99918561
	IR Printer	X99913877
	Steel box, lid and gasket	T21513859
	Gasket – Small 255 x 205mm	T21513862
	Heat Absorber	T21513861
	Ideal Finish Software	T21513863
	Additional Data Logger	T21513866
	6 Channel expansion unit	T21518559
	6 Channel expansion unit heat absorber	T21518560

Moisture

One of the most regular causes of a coating's failure is moisture. 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.

Many substrates in industry today that are coated are porous and can absorb moisture. It is necessary to measure the moisture content within the substrate to reduce the possibility of subsequent coating failure.

When powder coating substrates which have a high moisture content – such as wood or MDF, steam will generate during the curing process damaging the new coating. Other substrates, which may have a high moisture content include concrete, fibreboard, plasterboard, gypsum and brick.

Elcometer 118 Surface Moisture Meter

Moisture is one of the most frequent causes of paint failure and construction defects. The Elcometer 118 Surface Moisture Meter is a general purpose gauge which indicates the percentage moisture content of a material.

- Lightweight and portable
- Go/No Go concept
- Analogue display for easy understanding
- Simple and quick to use
- Interchangeable pin electrodes

The Elcometer 118 scale incorporates red and green colour coding, indicating high and low levels of moisture respectively. The analogue meter includes five scales: Wood 1, Wood 2, Plaster, Concrete and a linear reference scale for comparison only.

Tables of wood groups are included in the operating instructions.

The probe is pressed firmly against the test surface and the result is immediately displayed on the relevant scale.

Range - Wood 1	14%-30% (% moisture content)	Resolution	1% (Not Linear Scale)
Range - Wood 2	15%-30% (% moisture content)	Accuracy (Using electrical resistance standards)	±2% of reading
Range - Plaster	8%-20% (% moisture content)	Display	Colour Coded Analogue Scale
Range - Concrete	5%-14% (% moisture content)	Power	1 x 9V MN1604 PP3 Battery
Range - Linear Reference	0-10	Carrying Case Dimensions	60 x 155 x 165mm (2.4 x 6.1 x 6.5")
Instrument Dimensions	43 x 91 x 146mm (1.7 x 3.5 x 5.7")	Instrument Weight	230g (0.5lb)

Model	Description	Part Number
Elcometer 118	Elcometer 118 Surface Moisture Meter	G118----1

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Elcometer 7420 Digital Moisture Meter

A handy and easy to use instrument. The Elcometer 7420 does not use pins and does not damage the substrate under test.

The gauge is placed onto the material to be evaluated and quickly indicates the degree of moisture in concrete, fibreglass or wood down to a depth of 3cm (1.2″).

- High frequency method used.
- Digital display with moisture/dry comparison scale.
- No damage to the surface.

Model	Description	Part Number
Elcometer 7420	Elcometer 7420 Digital Moisture Meter	K0007420M001

Elcometer 7400 Compact Moisture Meter

The hand closes naturally around the ergonomic form of the housing so that the pins on the end of the instrument can be pressed into the material to be measured. The thin pins make it easy to measure the moisture content of sawn timber, chipboard and fibreboard materials up to a maximum thickness of 25mm as well as normal gypsum or mixed plaster.

- Handy, quick pocket-sized moisture meter for fast measurements.
- Two-group wood species correction.
- Measurement of plaster moisture content with a direct readout in percentage of dry weight.
- Completely automatic instrument setting.   • No separate electrodes or leads required.

Measuring Range	5 to 20% moisture content for wood with two-group species correction 0.3 to 3.5% moisture content for plaster, with large 3-digit LCD readout
Dimensions	200 x 35 x 35mm (7.87 x 1.38 x 1.38")
Weight	130g (4.6oz)
Power supply	9V dry cell or rechargeable battery
Part Number	K0007400M018

Elcometer 7400 Compact "A" Moisture Meter

The measuring principle of the COMPACT "A" is based on the dielectric constant or high frequency method.

The meter is simply placed on the material to be tested, the moisture content can be read off immediately. No need to drive pins into the wood.

- Handy, pinless wood moisture meter for fast measurements.
- No separate measuring electrodes or cables required.   • Fully automatic adjustment of the indicator.
- Setting device for automatic correction of the readings depending on the species of wood. Setting range: Positions 1 to 10.

Measuring Range	5 to 45% moisture content, with digital LCD readout and wood species selector switch. Suitable for timber up to 40mm thick.
Dimensions	170 x 35 x 35mm (6.7 x 1.38 x 1.38")
Weight	180g (6.35oz)
Power supply	9V dry cell or rechargeable battery
Part Number	K0007400M021

Elcometer 7400 Compact "B" Moisture Meter

Electronic structural moisture indicator using a patented technique based on the dielectric constant/ high frequency method. The indicator is equipped with a digital LCD readout and a universally applicable ball sensor for non-destructive location of moisture concentration in all kinds of building materials as well as for assessment of moisture distribution in walls, floors and ceilings.

- Handy rapid-action moisture indicator for fast measurements.
- No separate measuring electrodes or cables required.
- Ideal pre-tester for use with all moisture analysers using the carbide method.
- Fully automatic adjustment of the indicator.

Measuring Range	0 to 100 digits
Dimensions	200 x 35 x 35mm (7.87 x 1.38 x 1.38")
Weight	190g (6.7oz)
Power supply	9V dry cell or rechargeable battery
Part Number	K0007400M023

Elcometer 7400 H65 Moisture Meter

Designed for fast measurement of timber (up to 180mm thick), particleboard and veneer. Ideal both for single and series measurements before, during and after processing wood.

- Handy quick moisture meter for fast measurements.
- Direct reading by digital LCD, resolution: 0.1% moisture content.
- Wood species selector for automatic correction of readings for over 300 species of wood.
- Automatic compensation for wood temperature between –10 and $^+$40°C.
- Fully automatic instrument setting – no manual adjustment necessary.

Measuring Range	4 to 60% moisture content with correction facility for four groups of wood and automatic temperature compensation, display by digital LCD readout
Dimensions	140 x 90 x 42mm (7.87 x 1.38 x 1.38")
Weight	220g (6.7oz)
Power supply	9V dry cell or Ni-Cad Accumulator
Can be used with measuring electrodes	M18, M20, M20-OF 15, M20 HW 200/300 (See pages 122-124 for full details)

Model	Description	Part Number
Elcometer 7400/4	Elcometer 7400 Moisture Meter H65 complete with M20 Electrode	K0007400M004
Elcometer 7400/5	Elcometer 7400 Moisture Meter H65 complete with M18 Electrode	K0007400M005

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Elcometer 7400 UNI 1 Moisture Meter

Electronic indicating instrument with digital LCD readout, used with various electrodes to measure moisture content in a range of materials.

Elcometer 7400 UNI 2 Moisture Meter

Electronic indicating instrument with digital LCD readout, used with various electrodes and an additional measuring device for structural moisture using the electrical resistance method.

Electrode	Description	Measuring Range
MB35	For surface moisture measurement on concrete.	2 to 8% moisture content (according to oven test).
B50	For the detection of dampness in all kinds of building materials.	0 to 199 digits (scanning range)
B60	Identical to B50 but equipped with limit value selector and acoustic signal generator.	0.3 to 8.5% of dry weight or 0.3 to 6.5% moisture content by conversion table
Dimensions	140 x 90 x 42mm (5.5 x 3.54 x 1.65")	
Weight	230g (8.11oz)	
Power Supply	9V dry battery IEC 6 F 22 or rechargeable battery	

Model	Description (for electrode description – see pages 122-124)	Part Number
Elcometer 7400/11	Elcometer 7400 Moisture Meter UNI 1 complete with MB35 Electrode	K0007400M011
Elcometer 7400/12	Elcometer 7400 Moisture Meter UNI 1 complete with B50 Electrode	K0007400M012
Elcometer 7400/19	Elcometer 7400 Moisture Meter UNI 1 complete with B60 Electrode	K0007400M019
Elcometer 7400/13	Elcometer 7400 Moisture Meter UNI 2	K0007400M013

Can be used with the following range of measuring electrodes (For full information on electrodes, see pages 122-124)

	UNI 1	UNI 2
Structural Moisture	MB35, B50, B60, RF-T31, RF-T36,	MB35, B50, B60, RF-T31, RF-T36, M6, M6-150/250, M 6-Bi200/300, M21-100/250, M25
Air Humidity	RF-T28, RF-T31, RF-T32, RF-T36	RF-T28, RF-T31, RF-T32, RF-T36
Temperature Measurement	OT100, OTW90, ET10, ET50, TT30, TT40, LT20	OT100, OTW90, ET10, ET50, TT30, TT40, LT20

Oven Temperature Data Recorder
see pages 114-116

Elcometer 7400 RTU 600 Moisture Meter

Electronic four-in-one meter designed for measurement of wood moisture, structural moisture, air humidity and temperature, with digital LCD readout. Automatic temperature compensation for wood temperatures between –10 and 80°C and very precise correction facility for all species of wood.

The best of its kind, the Elcometer 7400 RTU 600 is the culmination of over 45 years' experience in moisture and temperature measurement. It has been specially developed for architects, housing contractors, surveyors or anyone requiring reliable measuring in order to avoid or to assess complaints.

This instrument is ideal for monitoring artificial or natural drying of timber.
The Elcometer 7400 RTU 600 incorporates a highly sophisticated, fully electronic 4-circuit measuring system for fast, accurate measurements. The four integrated measuring ranges can perform tasks which previously required several different instruments.

- Handy moisture meter and thermometer for rapid measurements.
- Direct reading digital LCD readout. Resolution 0.1% or 0.1°C.
- Fully automatic calibration – no manual adjustment necessary.
- Automatic compensation of wood temperatures between –10 and 90°C.
- Highest accuracy of readings by selecting meter setting depending on species of wood.
- Non-destructive structural moisture measurement using active electrodes B50 and B60.
- Fast measurement of moisture of solid building materials using the resistance method.
- Precise temperature measurement by use of quadruple conductor PT100 temperature probes.

Dimensions	180 x 115 x 53mm (7.09 x 4.53 x 2.09")
Weight	390g (13.8oz)
Power Supply	9V dry battery IEC6 F22 or rechargeable battery

Can be used with the following range of measuring electrodes (For full information on electrodes, see pages 122-124)

	Electrode	Measuring Range
Structural Moisture	M6, M6-150/250, M6-Bi 200/300, M20, M20-OF15, M20-Bi 200/300, M21-100/250, M25, MB 35, B50, B60, RF-T31, RF-T31, RF-T36	0 to 80 digits, conversion into % of dry weight by graph. 0 to 199 digits, scanning range using probe B50 or B60 for determination of moisture concentration, classification by table, or 0.3 to 8% of dry weight by conversion table, using probe B50 or B60. 2 to 8% of dry weight on testing concrete surfaces by probe MB35.
Air Humidity	RF-T28, RF-T31, RF-T32, RF-T36	7 to 98% R.H.
Temperature Measurement	OT100, OTW90, ET10, TT30, TT40, LT 20	Dependent on probe selected – see pages 122-124
Wood Moisture Measurement	M18, M20, M20-HW 200/300, MH34	4 to 100% moisture content 40 to 200% moisture content

Model	Description (for electrode description – see pages 122-124)	Part Number
Elcometer 7400/22	Elcometer 7400 Moisture Meter RTU600	K0007400M022
Elcometer 7400/08	Elcometer 7400 Moisture Meter RTU600 complete with M20 and RF-T28 Electrode	K0007400M008

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ELECTRODES FOR MOISTURE MEASUREMENT IN BUILDING MATERIALS	
Drive-in Electrode M20	For moisture measurement of timber up to 50mm (2") thick. Electrode body is made of impact resistant plastic. Included in the delivery are ten spare pins 16mm (0.63") and 23mm (0.90"). KT007400P003
Surface Measuring Caps M20-OF 15	For moisture measurements on surfaces without damaging the material. Effective up to a depth of approximately 3mm (0.12"). (Only to be used with electrode M20). KT007400P042
Stick-in Electrode M6	For moisture measurement on hard, solid building materials (mortar, concrete, etc.). With two of each electrode pins 23mm (0.90"), 40mm (1.56") and 60mm (2.36") long (only to be used with contact paste). KT007400P007
Flat Electrode Pair M6-Bi 200/300	For moisture measurements on concrete or insulation materials in corner or expansion joints (with insulated shank). Dimensions: 10 x 0.8 x 200mm (0.39 x 0.03 x 7.87") KT007400P085 Dimensions: 10 x 0,8 x 300mm (0.39 x 0.03 x 11.8") KT007400P086
Pair of Brush Electrodes M25	Stainless steel electrodes, for moisture measurements on hard and soft building materials without contact paste. KT007400P089
Stick-in Electrode Pins M20-Bi 200/300	For moisture measurement of materials hidden beneath another panel or covering. (Only to be used with electrode M20). 200mm (7.87") Length KT007400P023 300mm (11.8") Length KT007400P024
Deep Electrodes M21-100/250	For deep moisture measurements of all kinds of solid building materials in conjunction with contact paste. 100mm (3.94") Length KT007400P008 250mm (9.84") Length KT007400P009
Stick-in Electrode Pins M6-150/250	Extra thin probes for measuring the moisture content in building and insulating materials over expansion joints or through non insulated intersecting tile joints. For use with electrodes M6 and M20. 150 x 3mm (5.90 x 0.12") Length KT007400P087 250 x 2mm (9.84 x 0.08") Length KT007400P088
Active Electrode MB35	With integrated measuring circuit, designed for surface moisture measurement on concrete, in particular before coating, painting or colour marking. Measuring range: 2 to 8% of dry weight. KT007400P032

ELECTRODES FOR MOISTURE MEASUREMENT IN BUILDING MATERIALS (continued)

Active Electrode B50	With integrated measuring circuit, designed for non-destructive location of moisture concentration in building materials and moisture distribution in walls, ceilings and floors. The electrode uses a patented process to create a high frequency field with a penetration depth of up to 120mm (4.72") depending on the density of the tested building material. Measuring range: 0 to 199 digits scanning range (classification according to table). 0.3 to 8.5% of dry weight, conversion of reading by table. 0.3 to 6.5% moisture content, conversion of reading by table. KT007400P031
Active Electrode B60	With integrated measuring circuit, designed for non-destructive location of moisture concentration in building materials and moisture distribution in walls, ceilings and floors. The electrode uses a patented process to create a high frequency field with a penetration depth of up to 120mm (4.72") depending on the density of the tested building material. With additional selector and acoustic signal generator for setting a limit value between 20 and 140 digits. Measuring range: 0 to 199 digits scanning range (classification according to table). 0.3 to 8.5% of dry weight, conversion of reading by table. 0.3 to 6.5% moisture content, conversion of reading by table. KT007400P082

ELECTRODES FOR WOOD MOISTURE MEASUREMENT

Drive-in Electrode M20	For moisture measurement in timber up to 50mm (2") thick. Electrode body of impact resistant plastic. Included in the delivery are ten spare pins 16mm (0.63") and 23mm (0.90"). KT007400P003
Ram-in Electrode M18	For moisture measurement in timber up to about 180mm (7.10") thick. Supplied with ten spare pins 40mm (1.56") and 60mm (2.36") long. Teflon insulated electrode needles for point measurements at different depths are also available. KT007400P002
Active Electrode MH34	With integrated measuring circuit for measurement of high moisture contents in coniferous wood, specially in case of water-borne storage and for pre-sorting of freshly cut timber for kiln drying. Measuring range: 40 to 200% moisture content. KT007400P033
Stick-In Electrode Pins M20-HW 200/300	Non-insulated pins for use with electrode M20 for moisture checks on chips, woodwool etc. 200mm (7.87") Length KT007400P021 300mm (11.8") Length KT007400P022
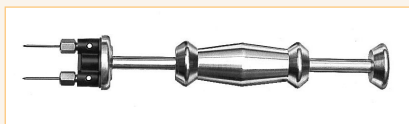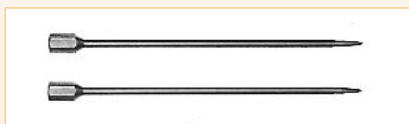
ELECTRODES FOR TEMPERATURE MEASUREMENT	
ET10	Robust stick-in temperature sensor for solid substances, bulk materials and fluids.
	Length of probe 100mm (3.94"), diameter 3mm (0.12"). Measuring range –50 to 250°C
	KT007400P006
TT40	Robust immersion and combustion gas temperature sensor.
	Length of probe 480mm (7.10"), diameter 5mm (0.20"). Measuring range –50 to 350°C
	KT007400P016
LT20	Fast reacting air/gas temperature sensor with probe.
	Length 480mm (7.10"), diameter 5mm (0.20"). Measuring range –20 to 200°C
	KT007400P018
TT30	Robust immersion and combustion gas temperature sensor.
	Length of probe 230mm (9.05"), diameter 3mm (0.12"). Measuring range –50 to 350°C
	KT007400P017
ET50	Fast reacting stick-in temperature sensor for soft solid substances, bulk materials and Fluids.
	Length of probe 120mm (4.72"), diameter 3.0mm (0.12"). Measuring range –50 to 300°C
	KT007400P014
OTW90	Angled special surface temperature sensor for use at veneer presses etc.
	Length of probe 100mm (3.94"), diameter 5mm (6.20"). Measuring range –50 to 250°C
	KT007400P051
OT100	Spring loaded, low mass surface temperature sensor, for use on wall surfaces, etc.
	Length of probe 110mm (4.33"), diameter 5mm (0.20"). Measuring range –50 to 250°C
	KT007400P015

ELECTRODES FOR MEASUREMENT OF RELATIVE HUMIDITY		
Special Electrode RF-T28	For high-speed testing of air relative humidity and air temperature, complete with connection cable.	
	Measuring range: 7 to 98% R.H., –10 to +80°C.	
		KT007400P013
Special Electrode RF-T36	For measurement of air humidity and air temperature, water activity value or equilibrium moisture in rooms, warehouses or solid substances (e.g. concrete, subflooring, masonry, etc.).	
	Measuring range: 5 to 98% R.H., –5 to +60°C.	
		KT007400P067
Plug-in Sensor RF-T31	For measurement of atmospheric moisture, water activity value or equilibrium moisture in bulk materials and solid substances, e.g. brickwork and other building materials.	
	Measuring range: 7 to 98% R.H., -10 to +80°C. Diameter 10mm (0.39"), sintered filter tip 32mm (1.26") long.	
	Insertion Length 250mm (9.84")	KT007400P054
	Insertion Length 500mm (19.7")	KT007400P055
Blade Sensor RF-T32	For measurement of atmospheric humidity, water activity value and equilibrium moisture in paper, leather, textile and tobacco stores etc.	
	Range of Measurement 7 to 98% R.H., –10 to +80°C. Flat elliptical probe 10 x 4mm (0.39 x 0.16")	
	Insertion Length 250mm (9.84")	KT007400P059
	Insertion Length 500mm (19.7")	KT007400P060

Wet Film Thickness

It is important that a coating is applied to the correct thickness. Applying too much wet coating will not only waste time and money, but there is also a possibility of the coating cracking during the curing process. Too little coating and there is a chance that the substrate will not be sufficiently covered.

To control process variables, it is often desirable to measure whilst the film is still wet. Wet film measurements are also useful for systems where the dry film thickness can only be measured destructively.

Elcometer 3230 Wet Film Wheels

The Elcometer 3230 Wet film Wheels, formally known as the Elcometer 120 consists of three circles. The central circle is of smaller diameter and is eccentric of the two outer circles. By rolling the gauge through a wet coating, the centre disc eventually touches the film. This point on the scale indicates the thickness.

If the volume to solids ratio of the coating is known, then the wet film thickness can be used to predict the dry film thickness.

Various measurement ranges from 0 to 25µm - 0 to 3000µm (0 to 1mil - 0 to 40mils) are available.

- Continuous Scale results in ±5% measurement accuracy
- Suitable for flat and curved surfaces
- Stainless steel giving a hard-wearing instrument which can be cleaned with solvents for reuse

Can be used in accordance with:

ASTM D 1212-91-A	BS 3900-C5-7A
ISO 2808-7A	NF T30-125

Model	Description	Scale Range	Graduations	Part Number
Elcometer 3230/1	Elcometer 3230 Wet Film Wheel	0-25µm	1.25µm	K0003230M001
Elcometer 3230/16	Elcometer 3230 Wet Film Wheel	0-40µm	2.0 µm	K0003230M016
Elcometer 3230/2	Elcometer 3230 Wet Film Wheel	0-50µm	2.5µm	K0003230M002
Elcometer 3230/3	Elcometer 3230 Wet Film Wheel	0-100µm	5.0µm	K0003230M003
Elcometer 3230/4	Elcometer 3230 Wet Film Wheel	0-150µm	7.5µm	K0003230M004
Elcometer 3230/5	Elcometer 3230 Wet Film Wheel	0-200µm	10.0µm	K0003230M005
Elcometer 3230/6	Elcometer 3230 Wet Film Wheel	0-250µm	12.5µm	K0003230M006
Elcometer 3230/7	Elcometer 3230 Wet Film Wheel	0-300µm	15.0µm	K0003230M007
Elcometer 3230/8	Elcometer 3230 Wet Film Wheel	0-400µm	20.0µm	K0003230M008
Elcometer 3230/9	Elcometer 3230 Wet Film Wheel	0-500µm	25.0µm	K0003230M009
Elcometer 3230/10	Elcometer 3230 Wet Film Wheel	0-1000µm	50.0µm	K0003230M010
Elcometer 3230/15	Elcometer 3230 Wet Film Wheel	0-1500µm	75.0µm	K0003230M015
Elcometer 3230/11	Elcometer 3230 Wet Film Wheel	0-2000µm	100µm	K0003230M011
Elcometer 3230/12	Elcometer 3230 Wet Film Wheel	0-3000µm	150µm	K0003230M012
Elcometer 3230/1a	Elcometer 3230 Wet Film Wheel	0-1mils	0.05mil	K0US3230M001
Elcometer 3230/2a	Elcometer 3230 Wet Film Wheel	0-2mils	0.1mil	K0US3230M002
Elcometer 3230/3a	Elcometer 3230 Wet Film Wheel	0-4mils	0.2mil	K0US3230M003
Elcometer 3230/4a	Elcometer 3230 Wet Film Wheel	0-6mils	0.25mil	K0US3230M004
Elcometer 3230/5a	Elcometer 3230 Wet Film Wheel	0-12mils	0.5mil	K0US3230M005
Elcometer 3230/6a	Elcometer 3230 Wet Film Wheel	0-20mils	1mil	K0US3230M006
Elcometer 3230/7a	Elcometer 3230 Wet Film Wheel	0-40mils	2mil	K0US3230M007
Accessories	50cm (19") Wet film wheel handle			KT003230N002
	100cm (39") Wet film wheel handle			KT003230N001

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Elcometer 3230 Coil Coating Wet Film Wheels

Similar to the Elcometer 3230 Wet film Wheels, but designed for use in the coil coating process. These Coil Coating Wheels consist of three circles. The outer circles 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 disc eventually touches the film. This point on the scale indicates the thickness.

If the volume to solids ratio of the coating is known, then the wet film thickness can used to predict the dry film thickness.

Model	Description	Scale Range	Graduations	Part Number
Elcometer 3230/17	Grooved Wet Film Wheel – Coil Coating	0-50µm	2.5µm	K0003230M017
Elcometer 3230/18	Grooved Wet Film Wheel – Coil Coating	0-100µm	5.0µm	K0003230M018
Elcometer 3230/19	Grooved Wet Film Wheel – Coil Coating	0-300µm	15.0µm	K0003230M019
Elcometer 3230/17a	Grooved Wet Film Wheel – Coil Coating	0-2mils	0.1mil	K0US3230M017
Elcometer 3230/18a	Grooved Wet Film Wheel – Coil Coating	0-4mils	0.2mil	K0US3230M018
Elcometer 3230/19a	Grooved Wet Film Wheel – Coil Coating	0-12mils	0.5mil	K0US3230M019
Accessories	50cm (19") Wet film wheel handle			KT003230N002
	100cm (39") Wet film wheel handle			KT003230N001

Elcometer 112 & 3236 Hexagonal Wet Film Combs

Precision formed in stainless steel to be long-lasting and reusable, these hexagonal wet film combs are supplied in a range of thicknesses and can measure up to a maximum thickness of 3000µm (120mils). This high upper value allows measurement of thick coatings which are difficult to test by other methods.

How to use a wet film comb

- Place a comb perpendicular to and touching the substrate. Hold the comb in position and wait a few seconds until the teeth are "wet."
- Remove the comb from the film.
- The wet film thickness lies between the biggest value "coated" or "wet" tooth and the smallest value "uncoated" or "dry" tooth.

Can be used in accordance with:	
ASTM D 4414-A	BS 3900-C5-7B
ISO 2808-7B	NF T30-125

Model	Description	Range	Values	Part Number
Elcometer 3236/1	Elcometer 3236 Hexagonal Wet Film Comb	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	K0003236M001
Elcometer 3236/2	Elcometer 3236 Hexagonal Wet Film Comb	25-2000µm	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000µm	K0003236M002
Elcometer 112/1	Elcometer 112 Hexagonal Wet Film Comb	25-3000µm	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 1000, 1100, 1200, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000µm	B112----1
Elcometer 112/2	Elcometer 112 Hexagonal Wet Film Comb	1-120mils	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 120mils	B112----2

Elcometer 112AL Punched Aluminium Wet Film Combs

These punched aluminium combs offer the User a low cost method of measuring the wet film thickness.

Being punched from Aluminium, the Elcometer 112AL is not as accurate as the high precision versions on page 126.

Supplied in a pack of 10 combs, they have Metric units (25 - 3000µm) on one side and Imperial values (1 - 118mils) on the reverse.

Can be used in accordance with:	
ASTM D 4414-A	BS 3900-C5-7B
ISO 2808-7B	NF T30-125

Model	Description	Range	Part Number
Elcometer 112AL	Elcometer 112AL Aluminium Wet Film Comb (x10)	25-3000µm 1-118mils	B112AL12473-3

Elcometer 115 Wet Film Combs

These precision combs, formed in stainless steel to be long-lasting and reusable, are supplied in Metric and Imperial values on the same comb.

Four separate ranges of thicknesses are available up to a maximum thickness of 1270µm (50mils). Each comb has 10 measurements (or teeth) per comb.

Each comb is supplied individually in a protective pouch or as a set of 4 in a single leather case.

Can be used in accordance with:	
ASTM D 4414-A	BS 3900-C5-7B
ISO 2808-7B	NF T30-125

Model	Description	Range		Part Number
		µm	mils	
Elcometer 115/1	Elcometer 115 Wet Film Comb	25-330	1-13	B11529451
Elcometer 115/2	Elcometer 115 Wet Film Comb	51-457	2-18	B11529452
Elcometer 115/3	Elcometer 115 Wet Film Comb	51-762	2-30	B11529453
Elcometer 115/4	Elcometer 115 Wet Film Comb	127-1270	5-50	B11529454
Elcometer 115/W	Set of 4 (Scales to be determined by customer when ordering)			B11529459W

The Elcometer 115 can be customised to include your company details. Please contact Elcometer for further information.

Elcometer 3238 Long Edge Wet Film Combs

Similar to the Elcometer 115, the Elcometer 3238 provides the User with more measurement points (teeth). These rectangular wet film combs are available in 3 ranges – supplied either separately or in a set of 3.

Can be used in accordance with:	
ASTM D 4414-A	BS 3900-C5-7B
ISO 2808-7B	NF T30-125

Model	Description	Range (µm)	Measurement Steps (µm)	Part Number
Elcometer 3238/1	Elcometer 3238 Long Edge Wet Film Comb	50-120	5	K0003238M001
Elcometer 3238/2	Elcometer 3238 Long Edge Wet Film Comb	25-600	25	K0003238M002
Elcometer 3238/3	Elcometer 3238 Long Edge Wet Film Comb	50-1200	50	K0003238M003
Elcometer 3238/4	Set of 3 Long Edge Wet Film Combs (Scales 1, 2 and 3)			K0003238M004

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Elcometer 154 Plastic Wet Film Combs

Made from ABS plastic, the Elcometer 154 Wet Film Combs are designed to be used only once and kept as a record of wet film thickness measurement for your ISO or customer requirements.

Both Metric and Imperial values are on the same comb, 50 to 800µm on one side, 2 to 32mils on the reverse.

Supplied in a carton containing 500 combs.

Can be used in accordance with:	
ASTM D 4414-A	BS 3900-C5-7B
ISO 2808-7B	NF T30-125

Model	Description	Range		Part Number
		µm	mils	
Elcometer 154	Elcometer 154 Plastic Wet Film Combs (500)	50-800	2-32	B154----1

Elcometer 3233 Pfund Thickness Gauge

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 it leaves a trace.

The diameter of this mark depends on the thickness of the coating, which can be easily assessed from the conversion table supplied with the instrument.

- Ideal for measuring the thickness of translucent products (varnish, oils etc.)
- Measurement range of 2.25-360µm (0.09-14.17mils)
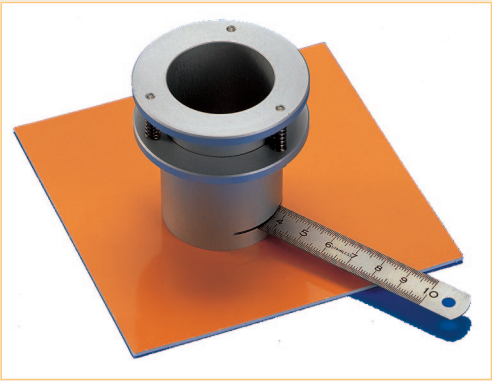
Can be used in accordance with:	
ASTM D 1212-D	NF T30-125

Model	Description	Part Number
Elcometer 3233/1	Elcometer 3233 Pfund Thickness Gauge - Aluminium	K0003233M001
Elcometer 3233/2	Elcometer 3233 Pfund Thickness Gauge - Stainless Steel	K0003233M002

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Powder Thickness Measurement – uncured

A powder coating has many advantages over a wet coating system, including:

- Little or no waste – excess powder or oversprayed powder can be recycled and reused.
- No solvents – tighter environmental controls of VOC emissions and legislation increases the need to use less or no solvents.

Making sure that the end product has the correct levels of adhesion and appearance - in particular gloss and colour – is dependent upon the thickness of the powder prior to the curing process, and the temperature profile of the oven.

Measuring the thickness of powder however, is difficult as touching it changes the powder thickness compressing it under the force. Elcometer have therefore developed two solutions to this problem.

Elcometer 155 Uncured Powder Film Comb[*]

Available in four scale ranges, the Elcometer 155 is designed to measure uncured powder coating film thickness. This enables the application system to be set up and fine tuned prior to the curing process. In turn, this will reduce the amount of scrap and over-spray.

Place the comb into the powder and slide the comb towards you. The measurement points (or teeth) are pointed and allow the powder to flow around them. The thickness of the powder lies between the biggest value where a drag mark is visible and the smallest value where a drag mark has not been produced.

Note: The thickness of a coating prior to cure is not necessarily the same value after curing. The powder comb is only suitable as a guide only.

	Metric	Imperial
Width	38mm	1^1/$_2$"
Length	46mm	1^1/$_2$"
Weight	18g	0.6oz
Tooth Accuracy	±5µm	±0.2mils

Model	Description	Range	Part Number
Elcometer 155/5	Elcometer 155 Metric Powder Film Comb	50-225µm	B15513573-5
Elcometer 155/6	Elcometer 155 Metric Powder Film Comb	225-1250µm	B15513573-6
Elcometer 155/1	Elcometer 155 Imperial Powder Film Comb	2-9mils	B15513573-1
Elcometer 155/2	Elcometer 155 Imperial Powder Film Comb	9-50mils	B15513573-2
Elcometer 155/10	Metric Comb Set	50-225µm and 225-1250µm	B15513573-10
Elcometer 155/9	Imperial Comb Set	2-9mils and 9-50mils	B15513573-9

*The Elcometer 155 is not available for sale in the USA.

Oven Temperature Data Recorders
see pages 114-116

Elcometer 550 Non Contact Uncured Powder Thickness Gauge[*]

The Elcometer 550 offers the User an unrivalled approach to measuring uncured powder thicknesses - without touching the powder.

The Elcometer 550 is designed to provide the user with the correct value of the cured film thickness by the measurement of the uncured powder thickness, enabling the application system (powder guns, line speed, etc) to be set up and fine tuned.

- Improves quality and saves you money
- Fast, easy to use
- Metric and Imperial versions
- Works on any rigid surface

The Elcometer 550 is a coating thickness gauge which uses unique ultrasonic technology to measure uncured powder coatings without contacting the surface and predicts the final thickness of the coating after cure.

The gauge has been designed for measuring the thickness of uncured powder coatings on smooth flat or curved metallic surfaces such as steel, aluminium, etc. The shrinkage that occurs when the powder cures in the oven is allowed for in the calibration of the gauge and the thickness displayed is the final coating thickness after cure.

Can be used in accordance with:
ASTM D 5101-15

- The probe is positioned about 17mm (³/₄") away from the surface to be measured and the Measure Button is pressed. The gauge's LEDs, on both the front panel and the probe, indicate the position and alignment of the probe relative to the surface.
  - One set of LEDs indicate distance.
    - If the middle LED is lit, the distance is correct.
    - If the LEDs to the right are lit, the probe is too far away.
    - If the LEDs to the left are lit, the probe is too close.
  - The other set of LEDs indicate the alignment of the reflected ultrasound. For optimum measurement the probe must be aligned at 90º to the surface.
    - If all the LEDs are illuminated, the alignment is correct.
    - When the position of the probe relative to the surface to be measured is optimised, the gauge will automatically take readings.
- As the readings are taken, the count is displayed on the gauge.
- Press the Measure Button again to stop the measurement.
- After about one second the gauge will display the predicted cured powder coating thickness.

Measurement Range	30-110µm (1.2-4.3mils)
Measurement Offset Distance	Approx 17mm (0.7")
Measurement Uncertainty	±5µm (±0.2mils)
Operating Temperature	5 to 45°C (40 to 113°F)
Dimensions	238 x 98 x 41mm (9.8 x 3.9 x 1.6")
Weight	1.6kg (3.5lb)
Resolution	1µm (0.1mils)

Each Elcometer 550 is supplied complete with:

Elcometer 550 Gauge with Rechargeable Battery, Battery Charger Unit with Separate Mains Power Supply, Ultrasonic Probe and lead, Spare Rechargeable Battery, Calibration Standard and Operating Instruction Book.

		Part Number		
Model	Description	UK 240V	EUR 220V	US 110V
Elcometer 550	Elcometer 550 Non-Contact Powder Gauge	A550----1	A550----2	A550----3
Accessories	Spare Battery Pack		T55016120	
	Calibration Block		T55016863	

*USA Patent Number 6250159 B1

Coating Thickness Gauges – Digital

Simple to interpret, small and portable gauges for the measurement of coatings on all metal surfaces. Digital coating thickness gauges are more accurate, more repeatable and more reproducible than other types of coating thickness gauge on the market today.

Elcometer offers the world's most comprehensive range of portable digital coating thickness gauges. For measurements on either Ferrous substrates (F), Non-Ferrous substrates (NF), or on both Ferrous and Non-Ferrous substrates (FNF), Elcometer can provide a gauge to meet your need.

With a wide choice of gauges to choose from, the User needs to understand the terminology of Coating Thickness Gauges or, ' The Language of CTGs'.

THE LANGUAGE OF CTGs
In selecting the most appropriate gauge for your application, you need to answer specific questions.

1   *What is the substrate (the surface metal) you are coating / inspecting?*

Is the metal a Ferrous Substrate (F) or a Non-Ferrous (NF)? Sometimes this is difficult to answer – the substrate may have already been coated. The easiest way to identify this is to see if a magnet will stick to the surface. If it does, then the substrate will be Ferrous, if it does not, then the substrate is Non-Ferrous.

2   *Do you measure only on this substrate?*

If you only inspect one type of product, then the answer is yes. If you have a range of products that you inspect, then you need to consider whether they are all of the same type of substrate. You should also consider if you have a future possibility of inspecting other substrates. If so, you should consider an FNF gauge.

3   *What is your Coating / Substrate Combination?*

Ensure compatibility of the coating and substrate; whether a coating thickness gauge will provide an accurate reading. See Appendix 1: What is my Coating/Substrate Combination on page 211.

4   *Typically, what sort of coating thickness do you need to measure?*

This will help you to select the correct probe scale range – e.g. Scale 1 measures coatings up to 1500µm (60mils).

5   *What type of probe do you need?*

Depending on your application you can select from:

- Integral Probe (the probe is built into the gauge for accurate single handed measurements on large surface areas, pipes, etc.).
- Separate Probe (the probe is connected to the gauge by a cable for all applications).
- PINIP™ (the separate probe is attached directly to the base of the instrument, providing your separate gauge with all the benefits of an integral unit).

Separate Probes can be selected from our wide range to meet your application requirements. These include:

- Regular Probes: Including Straight, Right Angle (90º) and Telescopic options.
- Miniature Probes: Including Straight, Right Angle (90º), 45º Angle all in either long or short versions.

6   *Do you need to save your readings for your ISO records or as proof of inspection to your customer?*

Elcometer gauges are available in three options:

- Basic Gauge – with simple statistics but no memory or data output.
- Standard Gauge – with statistics, limited memory and data output.
- Top Gauge – with statistics, enhanced memory, batching capability and data output.

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Elcometer 456 Coating Thickness Gauge

With it's recently enhanced and simplified menu screen options, the Elcometer 456 remains the most advanced hand held coating thickness gauge on the market today.

This flagship product is available in any combination of Basic, Standard and Top functionality; together with Integral (built in) and an extensive range of separate plug in probes.

With such an extensive range of gauge options, there is an Elcometer 456 to meet your specific application needs.

In this section the Elcometer 456 range is explained as follows:

- Gauge Features
- Integral Gauges and Options
- Separate Gauges
- Separate Probe Options - Standard, Miniature and PINIP™ Versions

Can be used in accordance with:		
FERROUS (F)	NON-FERROUS (NF)	DUAL FERROUS and NON-FERROUS (FNF)
ASTM B 499 BS 5411-11 BS 3900-C5-6Aa BS EN ISO 1461 DIN 50981 ISO 2178 ISO 2808-6Aa; prEN ISO 19840	ASTM D 1400 ASTM B 244 BS 5411-3 BS 3900-C5-6Ba BS 5599 DIN 50984 ISO 2360 ISO 2808-6Ba	All of the Ferrous and Non-Ferrous List plus; ASTM E 376

ELCOMETER 456 GAUGE FEATURES	Basic	Standard	Top
Fully interchangeable separate probe option	•	•	•
Menu driven display	•	•	•
User switchable Normal/Extended menu options	•	•	•
On-screen Help function	•	•	•
User switchable Metric/Imperial units	•	•	•
On-screen calibration instructions in 22 languages	•	•	•

Calibration options (stated):
  – smooth, 2 point, rough surfaces and special substrate
  – zero offset* (subtracts a fixed value from reading)
  – ISO, SSPC, Swedish and Australian predefined
	•
	•
		•
		•
			•
			•
			•

Backlight for measurement in dark areas	•	•	•
Infrared data output	•	•	•
Immediate data output	•	•	•
Batch data output		•	•
Cable data output to PC		•	•
Free PC software and download cable		•	•

Statistics (from single readings or within batches)
  – Number of readings, mean, standard deviation, coefficient of variation,
    highest and lowest readings
	•	•	•

Readings memory		250 readings in one batch	40,000 in up to 999 batches
Individual reading review		•	•
Individual batch calibrations			•
Reading limits (high and low values can be set by the user)		•	•
Clock and Alarm – prompt to take next reading			•
Date and Time stamp on print outs			•

*Zero Offset, USA Patent Number 6243661

ELCOMETER 456 GAUGE SPECIFICATIONS	
Measurement Speed	Greater than 60 readings per minute
Display	STN Graphics (LCD), 128 x 64 pixels; 19.8 x 39.6mm (0.78 x 1.56")
Battery Type	2 x AAA (LR03). Rechargeable batteries can also be used
Battery Life	30-40 hours continuous use with alkaline dry batteries. (15,000-20,000 readings at an average of 8 readings per minute).
Minimum Substrate Thickness	300µm (12mils) unless special calibration adjustment is made
Measurement Options	Ferrous (F), Non Ferrous (N) and Dual Ferrous and Non Ferrous (FNF)
Operating Temperature (Gauge)	0-50°C (32-120°F)
Dimensions	128 x 68 x 28mm (5.0 x 2.7 x 1.1")
Weight (incl. Dry Batteries)	130g (4.58oz)

Elcometer 456 Integral Gauge Options

The Elcometer 456 Integral (built in) Probes offer an ideal gauge for flat or uneven surfaces alike. Their large 'Bigfoot™' probe allows for consistent and repeatable results as there is no cable, readings can be taken using one hand.

The Elcometer 456 Integral Gauges are ideal for measuring both organic and inorganic coatings and are available in either:

- Ferrous (F)
- Non-Ferrous (NF), or
- Both Ferrous and Non-Ferrous (FNF)

ELCOMETER 456 INTEGRAL GAUGE - SPECIFICATIONS AND PART NUMBERS				
		Metric	Imperial	Part Number
BASIC	Ferrous Basic Integral Scale 1	0-1500µm	0-60mils	A456FBI1
	Ferrous Basic Integral Scale 2	0-5mm	0-200mils	A456FBI2
	Ferrous Basic Integral Scale 1 2* – High Resolution	0-5mm	0-200mils	A456FBI12
	Ferrous Basic Integral Scale 3	0-13mm	0-500mils	A456FBI3
	Non-Ferrous Basic Integral	0-1500µm	0-60mils	A456NBI1
	Dual Basic Integral FNF	0-1500µm	0-60mils	A456FNFBI1
STANDARD	Ferrous Standard Integral Scale 1	0-1500µm	0-60mils	A456FSI1
	Ferrous Standard Integral Scale 2	0-5mm	0-200mils	A456FSI2
	Ferrous Standard Integral Scale 1 2* – High Resolution	0-5mm	0-200mils	A456FSI12
	Ferrous Standard Integral Scale 3	0-13mm	0-500mils	A456FSI3
	Non-Ferrous Standard Integral	0-1500µm	0-60mils	A456NSI1
	Dual FNF Standard Integral	0-1500µm	0-60mils	A456FNFSI1
TOP	Ferrous Top Integral Scale 1	0-1500µm	0-60mils	A456FTI1
	Ferrous Top Integral Scale 2	0-5mm	0-200mils	A456FTI2
	Ferrous Top Integral Scale 1 2* – High Resolution	0-5mm	0-200mils	A456FTI12
	Ferrous Top Integral Scale 3	0-13mm	0-500mils	A456FTI3
	Non-Ferrous Top Integral	0-1500µm	0-60mils	A456NTI1
	Dual FNF Top Integral	0-1500µm	0-60mils	A456FNFTI1

*The F1 2 Scale combines the F1 and F2 Scales in a single probe (Patent applied for). The User selects the appropriate range (and hence resolution) for the work in hand.

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Elcometer 456 Separate Gauge Options

The Elcometer 456 Separate (Plug in) Probe Option is the most versatile gauge for the measurement of a wide range of coatings on metal substrates.

- Available in Basic, Standard and Top Models.
- Available in Ferrous (F), Non-Ferrous (NF) & Dual FNF versions.

Separate Elcometer 456 Probes are interchangeable. Each Probe has 'intelligent probe functionality', this means that:

- All Ferrous models will accept *ANY* Ferrous 456 probe
- All Non-Ferrous models will accept *ANY* Non-Ferrous 456 probe
- All Dual FNF models will accept *ALL* 456 probes

ELCOMETER 456 SEPARATE PART NUMBERS			
	BASIC	STANDARD	TOP
Ferrous (F) Separate	A456FBS	A456FSS	A456FTS
Non-Ferrous (NF) Separate	A456NBS	A456NSS	A456NTS
Dual Ferrous and Non-Ferrous (FNF) Separate	A456FNFBS	A456FNFSS	A456FNFTS

Probes for the Elcometer 456 Separate Gauges are supplied separately. Please remember to select the appropriate probe(s) from the Elcometer probes listed on pages 135 to 136.

Elcometer 456 Separate Gauge Probe Options

A wide range of probe types and scale ranges are available for the Elcometer 456 separate gauge.

STANDARD PROBES (F, NF & FNF)
Available in Standard, Right Angle or Telescopic options and are suitable for most coating thickness requirements.

MINIATURE PROBES (F & NF)
Ideal for taking measurements in hard to reach places, on small surface areas and on concrete reinforcement bars. Miniature probes are available in Straight, Right Angle and 45° options. All miniature probes are available in either 45mm (1.77") or 150mm (5.90") probe lengths.

PINIP™ PROBES (F, NF & FNF)
The Plug-In Integral Probe (PINIP™), screws into the base of any Elcometer 456 separate gauge to transform the separate gauge into an integral unit for single handed operations. Its 'Bigfoot™' Probe gives greater stability on large surface areas.
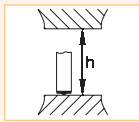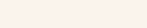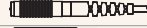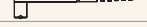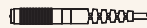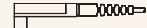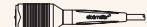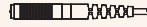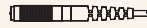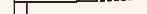
Also available is a High Temperature version for measuring coatings on hot ferrous substrates up to 250° (480°F).

Standard Probe Specifications

Operating Temperature	Up to 150°C (300°F)	
Storage Temperature	-10 to 60°C (14 to 140°F)	
Minimum Substrate Thickness	Ferrous – 0.3mm (12mils)	Non-Ferrous – 0.1mm (4mils)
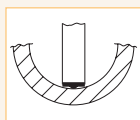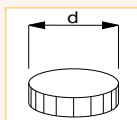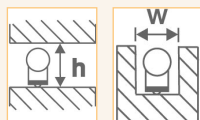
Probe Type	Minimum Convex Surface Diameter	Minimum Concave Surface Radius	Headroom	Minimum Sample Diameter
F1 (or F1 2 set as F1)	4mm (0.16")	25mm (0.98")	85mm (3.35")	4mm (0.16")
F2 (or F1 2 set as F2)	4mm (0.16")	25mm (0.98")	89mm (3.50")	8mm (0.32")
F1 Right Angle (or F1 2 set as F1)	4mm (0.16")	25mm (0.98")	28mm (1.10")	4mm (0.16")
F2 Right Angle (or F1 2 set as F2)	4mm (0.16")	25mm (0.98")	32mm (1.26")	8mm (0.32")
F1 Telescopic	4mm (0.16")	25mm (0.98")	32mm (1.26")	4mm (0.16")
F2 Telescopic	4mm (0.16")	25mm (0.98")	36mm (1.42")	8mm (0.32")
F3 Standard	15mm (0.59")	40mm (1.57")	102mm (4.02")	14mm (0.55")
N1	35mm (1.38")	25mm (0.98")	85mm (3.35")	6mm (0.24")
N1 Right Angle	35mm (1.38")	25mm (0.98")	28mm (1.10")	6mm (0.24")
N1A Anodiser's Probe	35mm (1.38")	25mm (0.98")	85mm (3.35")	6mm (0.24")
N2 Standard	100mm (3.97")	150mm (5.90")	85mm (3.35")	14mm (0.55")
FNF1 (N mode)	38mm (1.50")	25mm (0.98")	88mm (3.46")	8mm (0.32")
FNF1 (F mode)	4mm (0.16")	25mm (0.98")	88mm (3.46")	4mm (0.16")
FNF1 Right Angle (N mode)	38mm (1.50")	25mm (0.98")	34mm (1.34")	8mm (0.32")
FNF1 Right Angle (F mode)	4mm (0.16")	25mm (0.98")	34mm (1.34")	4mm (0.16")

Probe Type		Part Number	Measuring Range		Accuracy[1]		Resolution	
			Metric	Imperial	Metric	Imperial	Metric	Imperial
F1 Standard		T456F1S	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±0.1mil	0.1µm up to 100µm 1µm 100-1500µm	0.01mil up to 5mils 0.1mil 5-60mils
F1 Right Angle		T456F1R						
F1 Telescopic		T456F1T						
F2 Standard		T456F2S	0-5mm	0-200mils	±1-3% or ±0.02mm	±1-3% or ±1.0mils	1µm up to 1mm 10µm 1-5mm	0.01mil up to 50mils 1mil 50-200mils
F2 Right Angle		T456F2R						
F2 Telescopic		T456F2T						
			F1 MODE					
F1 2 Standard		T456F12S	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±0.1mil	0.1µm up to 100µm 1µm 100-1500µm	0.01mil up to 50mils 1mil 50-200mils
			F2 MODE					
F1 2 Right Angle		T456F12R	0-5mm	0-200mils	±1-3% or ±0.02mm	±1-3% or ±1.0mils	1µm up to 1mm 10µm 1-5mm	0.1mil up to 50mils 1mil 50-200mils
F3 Standard		T456F3S	0-13mm	0-500mils	±1-3% or ±0.05mm	±1-3% or ±2.0mils	1µm up to 2mm 10µm 2-13mm	0.1mil up to 100mils 1mil 100-500mils
N1 Standard		T456N1S	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±1.0mils	1µm up to 100µm 1µm 100-1500µm	0.01mil up to 5mils 0.1mil 5-60mils
N1 Right Angle		T456N1R						
N1A Anodiser Probe		T456N1AS						
N2 Standard		T456N2S	0-5mm	0-200mils	±1-3% or ±2.5µm	±1-3% or ±0.1mil	1µm up to 1mm 10µm 1-5mm	0.1mil up to 50mils 1mil 50-200mils
FNF1 Standard		T456FNF1S	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±0.1mil	0.1µm up to 100µm 1µm 100-1500µm	0.01mil up to 5mils 0.1mil 5-60mils
FNF1 Right Angle		T456FNF1R						

[1]Accuracy: ±1% when calibrated close to the required thickness, ±3% across the range.

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Miniature Probe Specifications

Measuring Range	0-500µm (0-20mils)
Operating Temperature	up to 150°C (300°F)
Accuracy[1]	±1-3% or ±2.5µm (±1-3% or ±0.1mils)
	(The accuracy quoted has been defined using a 100 micron foil, with the miniature probe held in a Probe Placement Jig.)
Resolution	Below 100µm: 0.1µm, 100-500µm: 1µm (Below 5mil: 0.01mil, 5-20mils: 0.1mil)

Probe Type[†]	Part Number	Minimum Convex Surface Diameter	Minimum Concave Surface Radius	Minimum Sample Diameter	Minimum Access Requirements	
					Height	Width
FERROUS MINIATURE PROBES						
Straight Probe, 45mm (1.77")	T456FM3---A	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	6mm (0.24")	
Straight Probe, 150mm (5.90")	T456FM3---C	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	6mm (0.24")	
45° Probe, 45mm (1.77")	T456FM3R45A	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	18mm (0.71")	7mm (0.28")
45° Probe, 150mm (5.90")	T456FM3R45C	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	18mm (0.71")	7mm (0.28")
90° Probe, 45mm (1.77")	T456FM3R90A	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	16mm (0.63")	7mm (0.28")
90° Probe, 150mm (5.90")	T456FM3R90C	1.5mm (0.06")	6.5mm (0.26")	3mm (0.12")	16mm (0.63")	7mm (0.28")
NON-FERROUS MINIATURE PROBES						
Straight Probe, 45mm (1.77")	T456NM3---A	3mm (0.12")	25mm (0.98")	4mm (0.16")	6mm (0.24")	
Straight Probe, 150mm (5.90")	T456NM3---C	3mm (0.12")	25mm (0.98")	4mm (0.16")	6mm (0.24")	
45° Probe, 45mm (1.77")	T456NM3R45A	3mm (0.12")	25mm (0.98")	4mm (0.16")	18mm (0.71")	7mm (0.28")
45° Probe, 150mm (5.90")	T456NM3R45C	3mm (0.12")	25mm (0.98")	4mm (0.16")	18mm (0.71")	7mm (0.28")
90° Probe, 45mm (1.77")	T456NM3R90A	3mm (0.12")	25mm (0.98")	4mm (0.16")	16mm (0.63")	7mm (0.28")
90° Probe, 150mm (5.90")	T456NM3R90C	3mm (0.12")	25mm (0.98")	4mm (0.16")	16mm (0.63")	7mm (0.28")

[1]Accuracy: ±1% when calibrated close to the required thickness, ±3% across the range.

[†]Additional probe lengths are available upon request. For further information please contact Elcometer.
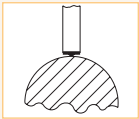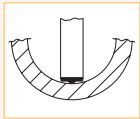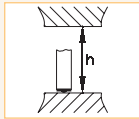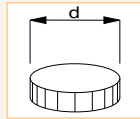
PINIP™ Probe Specifications

Operating Temperature	Up to 150°C (300°F) except for High Temp PINIP™ for temperatures up to 250°C (480°F)
Storage Temperature	-10 to 60°C (14 to 140°F)
Minimum Substrate Thickness	Ferrous – 0.3mm (12mils) Non-Ferrous – 0.1mm (4mils)

Probe Type	Minimum Convex Surface Diameter	Minimum Concave Surface Radius	Headroom	Minimum Sample Diameter
F1 (or F1 2 set as F1)	4mm (0.16")	60mm (2.36")	153mm (6.02")	4mm (0.16")
F2 (or F1 2 set as F2)	4mm (0.16")	60mm (2.36")	157mm (6.18")	8mm (0.32")
F3	15mm (0.59")	45mm (1.77")	168mm (6.61")	14mm (0.55")
N1	35mm (1.38")	50mm (1.97")	153mm (6.03")	6mm (0.24")
FNF1 (N mode)	38mm (1.50")	55mm (2.17")	154mm (6.06")	8mm (0.32")
FNF1 (F mode)	4mm (0.16")	55mm (2.17")	154mm (6.06")	4mm (0.16")

Probe Type	Part Number	Measuring Range		Accuracy[1]		Resolution	
		Metric	Imperial	Metric	Imperial	Metric	Imperial
F1 PINIP™	T456F1P	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±0.1mils	0.10µm up to 100µm 1µm 100-1500µm	0.01mils up to 5mils 0.1mils 5-60mils
F2 PINIP™	T456F2P	0-5mm	0-200mils	±1-3% or ±0.02µm	±1-3% or ±1.0mils	1µm up to 1mm 10µm 1-5mm	0.1mils up to 50mils 1mils 50-200mils
F1 2 High Temp PINIP™	T456F12PHT	0-5mm	0-200mils	±1-3% or ±0.02µm	±1-3% or ±1.0mils	1µm up to 1mm 10µm 1-5mm	0.1mils up to 50mils 1mils 50-200mils
F3 PINIP™	T456F3P	0-13mm	0-500mils	±1-3% or ±0.05µm	±1-3% or ±2.0mils	1µm up to 2mm 10µm 2-13mm	0.1mils up to 100mils 1mils 100-500mils
N1 PINIP™	T456N1P	0-1500µm	0-60mils	±1-3% or ±2.5µm	±1-3% or ±0.1mils	0.10µm up to 100µm 1µm 100-1500µm	0.01mils up to 5mils 0.1mils 5-60mils
FNF1 PINIP™	T456FNF1P	0-1500µm	0-60mils	±1-3% or ±1µm	±1-3% or ±0.04mils	0.10µm up to 100µm 1µm 100-1500µm	0.01mils up to 5mils 0.1mils 5-60mils

[1]Accuracy: ±1% when calibrated close to the required thickness, ±3% across the range.

elcometer®

Elcometer 345 "SSG" Coating Thickness Gauge

The Elcometer 345 Gauge has been specifically designed for the Steel Structures Industry for measuring the coating thickness on structural steel. It can be used to test the wide variety of coatings and coating systems used on bridges, ships, buildings, etc.

The Elcometer 345 SSG comes complete with a one year warranty and has two operating modes:

- Standard Mode - The total coating thickness over the steel substrate is displayed
- "Offset" Mode* - The User can enter an "offset" value, for example, equivalent to the surface roughness (profile), which is then automatically subtracted from the reading before it is displayed.

Zero Offset, USA Patent Number 6243661

Can be used in accordance with:	
ASTM B 499	BS 5411-11
BS 3900-C5-6Aa	BS EN ISO 1461
DIN 50981	EN ISO 19840
ISO 2178	ISO 2808-6Aa

	Metric	Imperial
Range	0-1500µm	0-60mils
Resolution	0.1µm up to 20µm	0.01mils up to 1.0mils
	1µm above 20µm	0.1mils above 1.0mils
Accuracy	±1-3% or ±2.5µm	±1-3% or ±0.1mils
	1% When calibrated close to the required thickness, 3% across full range	
Minimum Substrate Thickness	300µm	12mils
Maximum Sample Temperature	Intermittent measurements: 200°C	Intermittent measurements: 400°F
Ambient Operating Temperature	0-50°C	32-122°F
Instrument Dimensions	120 x 56 x 25.4mm	$4^3/_4$ x $2^1/_4$ x 1"
Measuring Rate	Greater than 40 readings per minute	
Battery Type	2 x AAA (LR03) supplied with gauge	
Weight (including Batteries)	115g	4oz
Part Number	A345SSG-1M	A345SSG-1E

Elcometer 345 Coating Thickness Gauge

The Elcometer 345 Coating Thickness Gauge is an incredibly versatile gauge.

With a range of probes in both Integral or Separate probe versions for coating thickness measurements on Ferrous (F), Non Ferrous (N) or both Ferrous and Non Ferrous (FNF) Substrates, the Elcometer 345 will have a gauge for your requirements.

The gauge is easy to use and has been designed with the operator in mind. User definable simple statistics allow the user to view average, standard deviation, number of readings, maximum and minimum thickness readings. These statistics can be printed out.

- Keylock™ feature to avoid accidental recalibration
- Switchable between microns or mm and mils
- Big Foot™ for stability on integral models
- Ideal for flat, curved and blasted surfaces
- Fast reading rate
- Two point calibration

Can be used in accordance with:
Standards listed on Page 132

Description	Range		Resolution		Accuracy*		Part Number
	µm	mils	Metric	Imperial	Metric	Imperial	
Elcometer 345 Ferrous Integral	0-1500	0-60	0.1µm up to 20µm	0.01mil up to 1.0mils	±1-3% or 2.5µm	±1-3% or ±0.1mils	A345FB-I1
Elcometer 345 Ferrous Separate	0-1500	0-60					A345FB-S1
Elcometer 345 Non-Ferrous Integral	0-1500	0-60	0.1µm up to 20µm	0.01mil up to 1.0mils	±1-3% or 2.5µm	±1-3% or ±0.1mils	A345NB-I1
Elcometer 345 Non-Ferrous Separate	0-1500	0-60					A345NB-S1
Elcometer 345 Dual FNF Integral**	0-1500	0-60	0.1µm up to 20µm	0.01mil up to 1.0mils	±1-3% or 2.5µm	±1-3% or ±0.1mils	A345FNFBI1
Elcometer 345 Dual FNF Separate**	0-1500	0-60					A345FNFBS1

*1% when calibrated close to the required thickness, 3% across the range   ** FNF Patent Number GB 2306009B. USA 5886522

Elcometer 311 Refinishing Gauge

The Elcometer 311 has been specifically designed to meet the requirements of today's automotive market.

The Elcometer 311 is available in two options. The ferrous only instrument is ideal for measuring steel car body panels. The Dual FNF instrument enables the User to take measurements on both steel and aluminium car body panels using one gauge.

Pre-calibrated on steel and aluminium car body panels, the Elcometer 311 is very easy-to-use. Checkpieces are supplied with each instrument to verify its performance.

- Designed specifically to meet the requirements of the automotive industry
- Ferrous and Dual FNF gauges available
- Pre-calibrated on automotive steel and aluminium
- Bigfoot™ for stable, repeatable readings
- Scale range of 0-500µm (0-20mils)
- Auto on/off switch
- Checkpiece included to verify performance – FNF gauge comes complete with ferrous and non-ferrous checkpieces
- Available in Metric or Imperial versions

		Metric	Imperial
Scale Range		0-500µm	0-20mils
Resolution		10µm	0.5mils
Probe Type		Integral only with auto switch on	
Accuracy		±5% or ±10µm whichever is the greater	±5% or ±1.0mils whichever is the greater
Operating Temperature		0° to 50°C	32°F to 120°F
Speed of Readings		30 per minute	
Battery Life (continuous)		20 hours	
Dimensions		56 x 24 x 120mm	2.2 x 0.95 x 4.75"
Weight (including Dry Batteries)		115g	4oz
Part Number	Ferrous Only	A311FM	A311FE
	Dual FNF	A311FNFM	A311FNFE

Elcometer 456 Coating Thickness Gauge
see pages 132-137

Appearance
see pages 59-79

Elcometer 355 Coating Thickness Gauges

Accuracy, simplicity, versatility and flexibility are the watchwords of the Elcometer 355, a truly state of the art hand-held measuring system packed with time-saving and cost cutting features. The key to the superiority of the Elcometer 355 is its measuring system which features a range of interchangeable Probe Modules capable of an accuracy of ±1% of the reading on a variety of coatings and substrates, including ferrous and non-ferrous substrates.

Elcometer 355 Standard Coating Thickness Gauges

The unit's large memory stores up to 5,000 readings in batches and data can be output to PC, datalogger or printer as required.

A full selection of Probe Modules allows choice for your application. All modules are supplied with calibration foils. See page 142.

- ±1% Accuracy
- Rugged Aluminium Case
- Traceable Thickness Standards
- EDTS[+] Excel Link and EDCS WIN Software supplied
- 5,000 reading memory in 25 pre-set batches
- Full statistical analysis – mean, standard deviation, number of readings, highest and lowest value

- RS232 Printer/PC Output – Serial and Parallel
- Date and time information

Can be used in accordance with:

Standards listed on Page 132. Please note the relevant standard is dependent on your probe selection.

Elcometer 355 Top Coating Thickness Gauges

Similar to the Elcometer 355 Standard Coating Thickness System, but with added features and memory. The unit's larger memory allows you to store up to 10,000 readings in various user identified batches and data can be output to a PC, datalogger or printer as and when required.

A full selection of Probe Modules allows choice for the particular application. All modules are supplied with calibration foils. See page 142.

- ±1% Accuracy
- High and Low Reasonable Limits
- Rugged Aluminium Case
- Traceable Thickness Standards
- EDTS[+] Excel Link and EDCS WIN Software supplied
- 10,000 reading memory in 200 batches (individually calibrated).
- Average and Counted Average mode
- Full Statistical Analysis – mean, standard deviation, number of readings, highest and lowest value.

- Password Protection
- RS232 Printer/PC Output – Serial and Parallel
- Date and Time

Can be used in accordance with:

Standards listed on Page 132. Please note the relevant standard is dependent on your probe selection.

	Metric	Imperial
Dimensions	175 x 83 x 42mm	6.9 x 3.3 x 1.6"
Weight	650g	1.43lbs
Operating Temperature	0 to 50°C	32 to 120°F
Storage Temperature	-10 to 60°C	14 to 140°F
Data Output	RS232C Serial or Parallel Output via 25p Way D Type Connector (Female)	
Batteries	3 x 1.5V AA Cells (Alkaline) or 3 x 1.5V Nickel Metal Hydride rechargeable cells	
Part Number	Elcometer 355 Standard Coating Thickness Gauge	A355----S
	Elcometer 355 Top Coating Thickness Gauge	A355----T

The Elcometer 355 is not supplied with a probe, please select a Probe from the Elcometer 355 & Elcometer 365 Probes on page 142.

Elcometer 365 SPC Coatings Analyser

Over the past few years, the increased demand on coating performance has resulted in a need for greater control throughout the coating process.

The Elcometer 365 has been designed to provide a controlled method of coating inspection - thereby allowing the user to monitor the coating process, statistically (SPC).

The data generated by the Elcometer 365 can alert the operator to alter the process before the coating parameters have been exceeded, avoiding costly re-work.

- 1% accuracy over a wide range of probe modules
- On screen charting: Histogram, Xbar and Range charts
- Real SPC Data Collection in a Coating Thickness Gauge
- Links directly into Datastat® SPC Software and EDTS+ Excel Link
- Process capability Cp, Cpk
- User definable batch names (Alpha-numerical)
- FORD, ISO, AT&T warnings
- High and Low Reasonable Limits
- RS232 Printer/PC Output - Serial and Parallel
- Traceable Thickness Standards
- Average and Counted Average Mode
- Date and Time
- Password Protection
- Fully networkable

Can be used in accordance with:

Standards listed on Page 132.
Please note the relevant standard is dependent on your probe selection.

Control of a coating process requires analysis of large amounts of data. The Elcometer 365 is a simple, efficient and convenient portable instrument for both data storage and analysis requirements. The Elcometer 365 uses the Elcometer Probe Modules to collect your coating thickness data whilst providing full statistical analysis in a number of formats which include:

- Control and Range Charts, Histogram, Pareto Chart

The User can quickly define the method of data collection and select the appropriate data presentation to determine whether the coating process is capable of meeting the required specification. The Elcometer 365 will give advanced warning that the process may be going out of control.

Attributes Analysis

The Elcometer 365 is not just a coating thickness gauge. By switching the gauge to Attributes Mode, the inspector can log all coating defects and provide attributes analysis i.e. scratch, chip, orange peel etc. All can be displayed on a Pareto Chart.

	Metric	Imperial
Dimensions	208 x 95 x 47mm	11 x 3.75 x 1.85"
Display	Liquid Crystal Super Twist Graphic 256 dots wide x 64 dots high	
Memory	Approximately 183K, Maximum 48 Parts, 255 Features, Up to 20,000 readings	
Weight	1kg	2.2lb
Operating Temperature	0 to 50°C	32 to 120°F
Storage Temperature	-10 to 60°C	14 to 140°F
Battery Type	6 x AA Alkaline	
Part Number	A365----0	

ELCOMETER 365 PROBE	The Elcometer 365 has been designed to use the Elcometer 355 Probe Modules – giving the User a complete range of thickness and substrate choices, with the true ±1% accuracy available with the Elcometer Probe Modules. Please see the Probe Options on page 142.

Elcometer 355 & Elcometer 365 Probes

Elcometer's unique Probe Modules allow versatile application of the Elcometer 355 and 365 Coating Thickness Gauges.

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.

Probe Type		Part Number	Measuring Range[1]		Accuracy		Resolution		Range Steps	
			µm	mils	µm	mils	µm	mils	µm	mils
F1 Standard		T35511952	0-1500	0-60	±1% or ±1µm	±1% or ±0.04mil	0.1	0.005	0-200	0-8
F1 Right Angle		T35511953					0.5	0.02	200-500	8-20
F1 Telescopic		T35511959					1.0	0.05	500-1500	20-60
F1A (Automotive)		T35512400								
F2 Standard		T35511954	0-5mm	0-200	±1% or ±5µm	±1% or ±0.2mil	2	0.1	0-0.5mm	0-20
F2 Right Angle		T35511955					5	0.2	0.5-5mm	20-200
F2 Telescopic		T35511960								
F3 Standard		T35511956	0-13mm	0-500	±2% or ±30µm	±2% or ±1mils	5	0.2	0-1mm	0-40
							10	0.5	1-13mm	40-500
F4 Standard		T35511950	0-250	0-10	±1% or ±1µm	±1% or ±0.04mil	0.1	0.005	0-250	0-10
F4 Right Angle		T35511951								
F5 (Rebar)		T35511962	0-800	0-32	±1% or ±2µm	±1% or ±0.08mil	1	0.1	0-800	0-32
F6 Standard		T35511964	0-25mm	0-1000	±2% or ±100µm	±2% or ±4mils	10	0.5	0-5mm	0-200
							50	2	5-25mm	200-1000
N1 Standard		T35511982	0-1500	0-60	±1% or ±1µm	±1% or ±0.04mil	0.1	0.005	0-200	0-8
N1 Right Angle		T35511983					0.5	0.02	200-500	8-20
							1.0	0.05	500-1500	20-60
N2 Standard		T35511984	0-5mm	0-200	±1% or ±15µm	±1% or ±0.6mil	2	0.1	0-0.5mm	0-20
							5	0.2	0.5-5mm	20-200
N4 (Anodisers)		T35511980	0-250	0-10	±1% or ±1µm	±1% or 0.04mil	0.1	0.005	0-250	0-10

[1]all measurements are displayed in either µm or mils unless otherwise stated.

Elcometer Digital Coating Thickness Gauge Accessories

JUMBO HAND GRIP
Ideal for precision placement for the most accurate results on flat and curved surfaces. Simply place the probe inside the Jumbo Hand Grip and take measurements

Description	Part Number
Jumbo Hand Grip – F and N Probes	T9997766-
Jumbo Hand Grip – FNF Probe	T99913225
Use with the following probes: F1 Standard F2 Standard F4 Standard F5 Rebar N1 Standard N4 Standard FNF Standard	
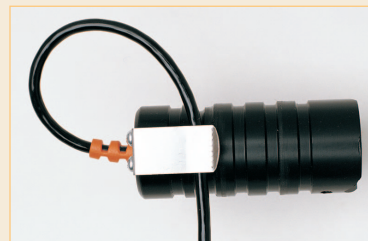
V-PROBE ADAPTER
Ideal for precision placement for the most accurate results on medium and large diameter curved surfaces such as pipes and cylinders.

Description	Part Number
V-Probe Adapter – F and N Probes	T9997381-
V-Probe Adapter – FNF Probe	T99913133
Use with the following probes: F1 Standard F2 Standard F4 Standard F5 Rebar N1 Standard N4 Standard FNF Standard	

SOFT MATERIAL/BLANKET PROBE
Ideal for taking precision readings on soft coatings or print blankets. The wide, flat base design acts as a load spreader, reducing the total force at a single point.

Description	Part Number
Soft Material/Blanket Probe	T35511963

PROBE PLACEMENT JIG
For the most reliable and repeatable coating thickness measurements, making the gauge score highly in repeatability and reproducibility studies. Ideal for small and large components alike.

Description	Part Number
Probe Placement Jig	T95012880
Component Hand Vice – a simple vice to hold small components	T95013028
Cable Release Assembly – ideal for remote measurements	T95012888
N4 Probe Adapter – must be purchased for use with N4 Probes	T95015589
FNF Probe Adapter – must be purchased for use with FNF Probes	T95015961
Miniature Probe Adapter – must be purchased for use with Miniature Probes	T95016896
Use with the following probes: F1 Standard F2 Standard F4 Standard F5 Rebar N1 Standard N4 Standard	

INFRARED PRINTER
This printer has been specifically selected for gauges which have IR output. This battery operated unit is an ideal choice for printing out individual readings and statistical information - without using a cable.

Description	Part Number
Elcometer IR Printer	X99913877
Use with the following gauges with IR output: Elcometer 215 Elcometer 319 Elcometer 345 Elcometer 456	

ELCOMETER DOT MATRIX MINI PRINTER
This serial portable printer has an internal rechargeable battery and can accept a signal from all Elcometer Gauges with a cable output. Using a cable allows the user to be confident that all data stored in the gauge will be printed, without loss or interruption

Description	UK 240V	EUR 220V	US 110V
Elcometer Dot Matrix Printer	X###9964B	X###9964C	X###9964D
Use with the following instruments with cable data out: Elcometer 206 Elcometer 223 Elcometer 345 Elcometer 355 Elcometer 456			

Replace ### with the model number to receive the correct data cable.

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Coating Thickness Standards

Formal quality systems such as those described in ISO 9000 and Guide 25 require that gauges be properly controlled, logged and in calibration. Increasingly, users are specifying that the readings taken by gauges are traceable to National Standards. There are three types of coating thickness standards available from Elcometer: coated standards, foils and zero test plates.

Elcometer 995 Coated Thickness Standards

These hard wearing and durable coated standards are mounted in an attractive protective folder and provide the user with an ideal method to accurately measure the performance of their coating thickness gauge.

- ±2% Accuracy, supplied with calibration certificate as standard
- Available in Ferrous (F) and Non-Ferrous (NF) substrates
- Two piece, three piece and four piece versions available
- Each standard is individually serial numbered for traceability to National Standards
- Can be re-certified by Elcometer to meet your ISO requirements
- Standards available in a range of thicknesses
- Special thicknesses can be supplied to meet your particular needs

COATED THICKNESS STANDARDS			
2-Piece Thickness Values (Ferrous)	Zero, 50, 250µm	Zero, 2.0, 10mils	T995166001
2-Piece Thickness Values (Non-Ferrous)	Zero, 50, 125µm	Zero, 2.0, 5.0mils	T995166011
3-Piece Thickness Values (Ferrous)*	100, 300, 500µm	4, 12.5, 20mils	T99518510
4-Piece Thickness Values (Ferrous)	Zero, 40, 75, 125, 175µm	Zero, 1.6, 3.0, 5.0, 7.0mils	T995111262
4-Piece Thickness Values (Non-Ferrous)	Zero, 40, 75, 125, 175µm	Zero, 1.6, 3.0, 5.0, 7.0mils	T995111271
4-Piece Thickness Values (Ferrous)	Zero, 50, 80, 125, 200µm	Zero, 2.0, 3.0, 5.0, 8.0mils	T995111263
4-Piece Thickness Values (Ferrous)	Zero, 50, 150, 250, 500µm	Zero, 2.0, 6.0, 10, 20mils	T995111261

*Designed specifically for use with the Elcometer 211 Mechanical Coating Thickness Gauges – see page 148 for further information.

Elcometer 990 Calibration Foils & Zero Test Plates

Ideal for use in the laboratory, on the production line or the construction site, calibration foils or 'shims' are the most convenient way of creating a coating thickness standard on your substrate material or form. The ideal method for adjusting the calibration of your coating thickness gauge to ensure the greatest possible accuracy.

In some cases, however, 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 to test a coating thickness gauge's functionality and calibration.

- Metric and Imperial values displayed on each foil
- Available individually or in foil sets – with or without Zero Plate
- Available as either a precision foil (±1% accuracy) or as a nominal foil (±2% accuracy)
- Each foil is uniquely serial numbered and can be certified traceable to National Standards
- Available in thicknesses from 12.5 to 20mm (0.5 to 790mils). See part numbers on page 145

ZERO TEST PLATES	
2% Ferrous	T3459529-
1% Ferrous	T3554910-
Large Ferrous	T9994054-

ZERO TEST PLATES	
2% Non-Ferrous	T3459530-
1% Non-Ferrous	T3554911-
Large Non-Ferrous	T9994055-

PRECISION FOILS SETS (±1% Accuracy) - Ideal for high accuracy instruments

Each foil set is supplied in a foil wallet with zero plate and calibration certificate

Range		Quantity	Foil Values		Part Number
µm	mils		µm	mils	
12.5-1500	0.5-60	8 foils/F Zero	12.5, 25, 50, 125, 250, 500, 1000, 1500	0.5, 1.0, 2.0, 5.0, 10, 20, 40, 60	T99049001
12.5-1500	0.5-60	8 foils/NF Zero	12.5, 25, 50, 125, 250, 500, 1000, 1500	0.5, 1.0, 2.0, 5.0, 10, 20, 40, 60	T99049002
50-4000	2.0-160	7 foils/NF Zero	50, 125, 250, 500, 1000, 2000, 4000	2.0, 5.0, 10, 20, 40, 80, 160	T99049003
500-8000	20.0-315	6 foils/F Zero	500, 1000, 2000, 3000, 4000, 8000	20, 40, 80, 120, 160, 315	T99049004
12.5-250	0.5-10	7 foils/F Zero	12.5, 25, 50, 75, 125, 175, 250	0.5, 1.0, 2.0, 3.0, 5.0, 7.0,10	T99049005
50-4000	2.0-160	7 foils/NF Zero	50, 125, 250, 500, 1000, 2000, 4000	2.0, 5.0, 10, 20, 40, 80, 160	T99049007
12.5-250	0.5-10	7 foils/NF Zero	12.5, 25, 50, 75, 125, 175, 250	0.5, 1.0, 2.0, 3.0, 5.0, 7.0,10	T99049006

NOMINAL FOILS SETS (±2% Accuracy)

Each foil set is supplied in a foil wallet

Range		Quantity	Foil Values		Part Number
µm	mils		µm	mils	
500-2000	20-80	4 foils	500, 1020, 2000(2)	20, 40, 80(2)	T9904199J
1000-8000	40-315	4 foils	1000, 2000, 4000, 8000	40, 80, 160, 315	T9904199K
25-1020	1.0-40	3 foils	25, 250, 1020	1.0, 10, 40	T9904199G
50-1020	2.0-40	4 foils	50, 125, 500, 1020	2.0, 5.0, 20, 40	T9904199S
50-1020	2.0-40	5 foils	50, 125, 250, 500, 1020	2.0, 5.0, 10, 20, 40	T99041991
12-175	0.5-7.0	5 foils	12, 25, 50, 125, 175	0.5, 1.0, 2.0, 5.0, 7.0	T99041995
12-250	0.5-10	6 foils	12, 25, 50, 125, 175, 250	0.5, 1.0, 2.0, 5.0, 7.0, 10	T99041990
12-500	0.5-20	6 foils	12, 25, 50, 125, 250, 500	0.5, 1.0, 2.0, 5.0, 10, 20	T99041994
1000-20000	40-790	6 foils	1000(2), 5000(2), 12000, 20000	40(2), 200(2), 475, 790	T99041993
12-1020	0.5-40	7 foils	12, 25, 50, 125, 250, 500, 1020	0.5, 1.0, 2.0, 5.0, 10, 20, 40	T9904199E
12-1020	0.5-40	8 foils	12, 25, 50, 125, 175, 250, 500, 1020	0.5, 1.0, 2.0, 5.0, 7.0, 10, 20, 40	T9904199F
50-4000	2.0-160	8 foils	50, 125, 250, 500, 1020(2), 3000, 4000	2.0, 5.0, 10, 20, 40(2), 120, 160	T99041992

INDIVIDUAL FOILS

Each foil is supplied in a foil wallet

Nominal		Colour	Precision Foils ±1% Accuracy	Nominal Foils ±2% Accuracy
µm	mils			
12.5	0.5	Silver	T990490101	T9904169-
25	1.0	Purple	T990490102	T9904170-
50	2.0	Dark Blue	T990490103	T9904171-
75	3.0	Green	T990490104	T99011411
125	5.0	Brown	T990490105	T9904172-
175	7.0	Peacock Blue	T990490106	T9904173-
250	10	White	T990490107	T9904174-
500	20	Black	T990490108	T9904175-
1000	40	Clear	T990490109	–
1020	40	Grey/Blue	–	T9904191-
1500	60	Off White	T990490110	–
2000	80	Clear	T990490111	T9904190-
3000	120	Clear	T990490112	T9904180-
4000	160	Clear	T990490113	T9904181-
5000	315	Slate	T990490114	T99011674

Notes: *Additional ±1% foils/shims are available covering the range 8 – 20mm (315 to 790mils). Please contact Elcometer for further information.*
±1% and ±2% foils cannot be combined on one Calibration Certificate. A Calibration Certificate can contain up to 8 foils.
Calibration Certificates are not available for foils above 8000µm.
1% foils below 50µm have an accuracy of ±0.5µm.
All foil values are nominal – foils values supplied may be slightly different to the values shown above to ensure greater accuracy.

Inspection Management Software

Elcometer provide a complete range of software packages designed for use with our gauges and other manufacturers' equipment. These software packages are either supplied with the appropriate instruments or can be downloaded from our website.

Elcometer EDCS$^+$ Coatings Management Software

EDCS$^+$ is a software program designed for the Coating Inspector and is an ideal tool for management of data collected by a wide range of Elcometer gauges.

EDCS$^+$ takes Coatings Management Software to a new level. A simple to use software program that allows the operator to access professional inspection results and generate specialised reports for the customer or for ISO reports.

EDCS$^+$ is so versatile - just look at some of the things that you can do with your data.
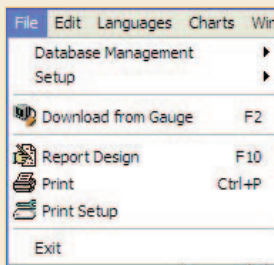
- Archive your data as you want to - organise your data as you need to see it - rename batches, set up folders for different customers
- Design your own reports to meet your corporate identity - add your company logo, photographs of the product under inspection, include summary data, etc
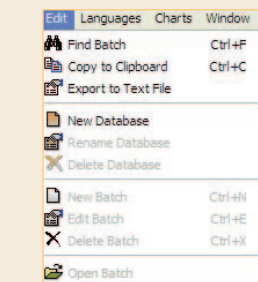
- Edit your data as you require
- Copy to clipboard and paste it into your own document
- Export data as a file to include in spreadsheet reports
- Create, delete and rename databases
- Open, create, edit and delete individual batches
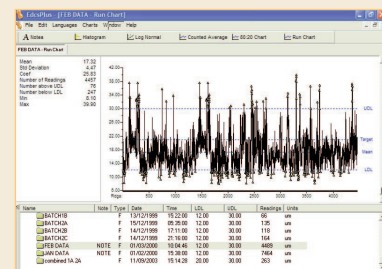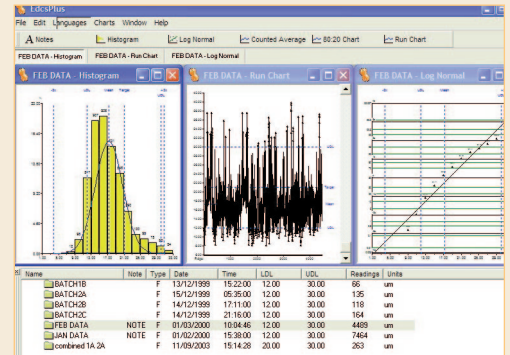
Run Chart - explore the uniformity
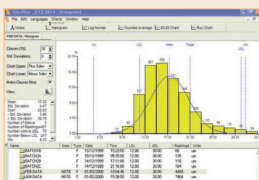
Histogram - how spread out is your data from the target thickness?
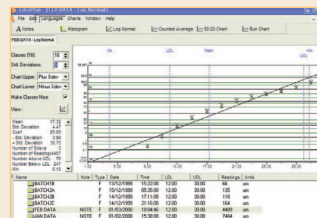
Log Normal - how normal is your data?

Model	Description	Part Number
Elcometer 960	Elcometer EDCS$^+$ Coating Management Software	T96016488

Elcometer Datastat SPC Software

This powerful software package provides the User with the means to control their production process. Through continuous inspection Datastat will help you to reduce re-work and scrap levels - increasing your profits and quality.

- Data Entry
- Capability Studies
- Database Management
- Process Improvement Reporting
- Charting
- Upgrade Paths
- Software Versions
- Customisation

See pages 198-201 for further information.
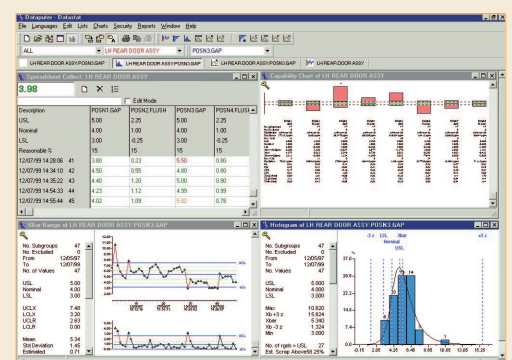
Coating Thickness Gauges – Mechanical

Mechanical Coating Thickness Gauges are an ideal choice when coating thickness needs to be measured where batteries cannot be used or are difficult to obtain. For example in remote locations, underwater, where dangerous gasses are present, you are looking for a basic coating thickness gauge to measure coatings on Ferrous Substrates (e.g. steel).

These gauges all use the original method of measurement – the amount of force needed to remove a magnet from a Ferrous Substrate and are basic coating thickness gauges to measure coatings on steel.

Elcometer 157 Coating Thickness Gauge

This simple pull-off gauge is a top pocket, lightweight, foreman's-type gauge for spot check indications of coating thickness.

- Insensitive to hot and cold coatings or surfaces - ideal for hot sprayed metal coatings for immediate results
- Easy to use and lightweight
- 3 Scales on the instrument body
- Pre-calibrated with no adjustment required
- Accuracy ±15%

Ranges	Each instrument has three scales printed on the body
	0-60µm, 0-25mils, and a Linear 0-10 equally spaced divisions
Accuracy	±15% of the reading
Packing List	Instrument, Protective Case and Graph Card
Part Number	A157----A

Elcometer 101 Coating Thickness Gauge

The Elcometer 101 was the world's first portable coating thickness gauge, first produced in 1947 and still has some advantages over other gauges.

- Insensitive to hot and cold surfaces – ideal for hot sprayed metal coatings
- Incorporates reading hold feature
- Accuracy of better than ±10%
- Ideal for hazardous areas

Minimum Substrate Thickness	1.5mm (60mils)	Operating Plane	90° to substrate
Minimum diameter for measurement on bar material	25mm (1")	Minimum Measurement Area	38 x 15mm (1.5 x 0.6")
Accuracy	Better than ±10 of the reading or ±2.5µm (0.1mils) whichever is the greater		

Model	Description	Range		Part Number
		µm	mils	
Elcometer 101/02A	Elcometer 101 Mechanical Coating Thickness Gauge	0-50	0-2	A101A-02A
Elcometer 101/05A	Elcometer 101 Mechanical Coating Thickness Gauge	0-250	0-10	A101A-05A
Elcometer 101/01A	Elcometer 101 Mechanical Coating Thickness Gauge	0-600	0-25	A101A-01A
Elcometer 101/15A	Elcometer 101 Mechanical Coating Thickness Gauge	0-9000	0-354	A101A-15A

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Elcometer 211 Coating Thickness Gauge

The Elcometer 211, commonly referred to as the "Banana Gauge," has proven to be a successful coating thickness gauge where the use of electronic instruments is difficult, e.g. inflammable atmospheres in oil and gas production.

The "v" grooved base, rubber feet and clear scale, with its ranges for thicker coatings, make this instrument one of the most popular mechanical gauges in the world.

- Factory calibrated – with user calibration adjustment
- Foils supplied to check calibration on site
- Ideal for very cold surfaces
- Small, portable, with an accuracy ±5%

The Elcometer 211 can also be supplied with a special 3 piece coated standard (traceable to NIST and UKAS) at a special price – contact Elcometer for further information.

Can be used in accordance with:	
ASTM D 1186-A	ASTM G 12
ASTM B 499	ASTM A 153
BS 5411-11	BS 3900-C5-6Ab
DIN 50981	ISO 2178
ISO 2808-6Ab	SSPC-PA2

Accuracy	±5% of the reading or ±2.5µm/0.1mils (whichever is the greater)
Minimum Substrate Thickness	0.4mm (16mils)
Minimum Area of Measurement	30mm (1.18") Diameter
Minimum Diameter for Measurement on Bar Material	20mm (0.8")
Edge Effects	Must be at least 6mm (0.24") from edge
Instrument Dimensions	200 x 60 x 30mm (7.8 x 2.4 x 1.2")
Certification Available	Certificate of Conformance and Calibration Certificate

Model	Description	Range		Part Number
		Metric	Imperial	
Elcometer 211/1M	Elcometer 211 Coating Thickness Gauge – Metric Scale 1M	0-1000µm	-	A211F--1M
Elcometer 211/1E	Elcometer 211 Coating Thickness Gauge – Imperial Scale 1E	0-1000µm	0-40mils	A211F--1E
Elcometer 211/2M	Elcometer 211 Coating Thickness Gauge – Metric Scale 2M	0.25-1.8mm	-	A211F--2M
Elcometer 211/8M	Elcometer 211 Coating Thickness Gauge – Metric Scale 8M	0.65-6 mm	-	A211F--8M
Elcometer 211/8E	Elcometer 211 Coating Thickness Gauge – Imperial Scale 8E	-	25-250mils	A211F--8E

The Elcometer 211 can also be supplied with a 3 piece coated standard at a special price – contact Elcometer for further information.

Coating Thickness Gauges – Destructive

Destructive thickness measurement is often the only guaranteed method available to test certain coating/substrate combinations including:

- Paint applied to concrete, wood, plaster, plastic, etc.

When it is necessary to measure the individual layer thickness in a multiple-layer coating system, the most accurate method available is the Paint Inspection Gauge (P.I.G.) coating thickness gauge.

1. Take the coated product

2. Using the supplied marker draw a line across the coating

3. Using the P.I.G. make a cut, at right angles to the marker line, all the way down to the substrate
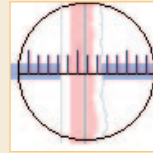
4. Using the microscope, count the number of graticule divisions across a coating layer.

5. Using the scale factor (number of µm or mils per graticule division), calculate the coating thickness for each layer.

Elcometer 141 Paint Inspection Gauge

The Elcometer 141 P. I. G. is a quick, versatile method of examination and measurement of coatings in a portable, easy to use instrument. Ergonomically designed to give a balanced weight distribution for a more consistent cut.

- Large easy to grip handle - allows the operator to cut thick or hard coatings easily
- Internal cutter storage compartment
- x50 magnification microscope
- Metric and Imperial Versions
- Can be converted into the Elcometer 107 Cross Hatch Cutter, see page 155

Can be used in accordance with:	
ASTM D 4138	BS EN 3900-CS-5B
ISO 2808-5B	

	Metric	Imperial
Scale Range (maximum)	2mm	0.08"
Overall Dimensions (fitted to handle)	160 x 100 x 35mm	6.3 x 4 x 1.4"
Weight (fitted to handle)	510g	1lb 2oz
Microscope	x50 Magnification with scale	
Cutting Tips Material	Tungsten Carbide	

Model	Description		Part Number	
			Metric	Imperial
Elcometer 141	Elcometer 141 Paint Inspection Gauge including 3 cutters (No. 1, 2 and 3)		A141---M	A141---E

Accessories	Description	Cutting Angle	Measurement Range		Graticule Scale Factor (per division)		Part Number
			µm	mils	µm	mils	
	Tungsten Carbide Cutter No 1	45°	20-2000	1-79	20	1	T14115761-1
	Tungsten Carbide Cutter No 2	26.6°	10-1000	0.5-35	10	0.5	T14115761-4
	Tungsten Carbide Cutter No 3	5.7°	2-200	0.1-7.9	2	0.1	T14115761-6

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Elcometer 121 Paint Inspection Gauge

This easy to use Paint Inspection Gauge provides the User with a cutter, microscope and light all in one housing and is perhaps the most recognised form of P. I. G.

- Battery powered illumination with built-in microscope
- Fully portable and robust
- Three cutters supplied (No. 1, 4 and 6)

Can be used in accordance with:	
ASTM D 4138	BS EN 3900-CS-5B
ISO 2808-5B	

Thickness Cutters	No. 1 Coating thickness between 20-2000µm (0.8-70mils)
	No. 4 Coating thickness between 10-1000µm (0.4-40mils)
	No. 6 Coating thickness between 2-200µm (0.08-8mils)
Microscope	X50 magnification

Model	Description	Part Number
Elcometer 121	Elcometer 121 Paint Inspection Gauge complete with Cutters No. 1, 4 and 6	A121-----
Accessories	Cutter No. 1	T1214426-
	Cutter No. 4	T1214429-
	Cutter No. 6	T1214430-

Elcometer 121/2 Universal P. I. G.

The Elcometer 121/2 Universal P. I. G. provides the User with a destructive coating thickness gauge and more:

- Built-in microscope with illumination
- Three cutters supplied (No. 1, 2 and 3)
- Adhesion – cross hatch cutter technique
- Hardness Tester – Buchholz Hardness Test

Three in one gauge, simply turn the wheel to change the function.

Can be used in accordance with:	
ASTM D 4138	ASTM D 3359-B
BS EN 3900-C5-5B	BS EN ISO 2815
DIN 53151	DIN 53153
ISO 2808-5B	ISO 2409
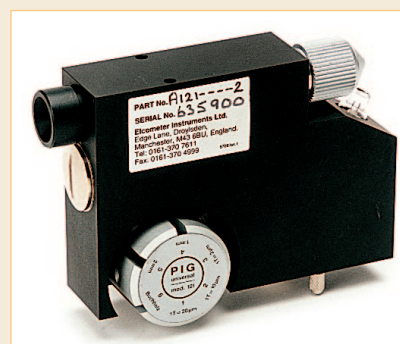
Thickness Cutters	No. 1 Coating thickness between 20-2000µm (0.8-70mils)		
	No. 2 Coating thickness between 10-1000µm (0.4-40mils)		
	No. 3 Coating thickness between 2-200µm (0.08-8mils)		
Special Cutters are also available	Special Cutter A: Coating thickness between 0-100µm (0-4mils)		
	Special Cutter B: Coating thickness between 0-3000µm (0-120mils)		
Buchholz Hardness Test	Indentation Tool	(Optional Accessory)	Slip-on Weight
Microscope	x50 magnification		

Model	Description	Part Number
Elcometer 121/2	Elcometer 121/2 Universal P. I. G. complete with Cutters No. 1, 2 and 3	A121----2
Accessories	Cutter No. 1	T12112191
	Cutter No. 2	T12112192
	Cutter No. 3	T12112193
	Special Cutter A (0-100µm)	T12112189
	Special Cutter B (0-3000µm)	T12112190
	Cross Hatch Tool 1mm (ASTM)	T12112183
	Cross Hatch Tool 1.5mm (ASTM)	T12112184
	Cross Hatch Tool 1mm (ISO/DIN)	T12112185
	Cross Hatch Tool 2mm (ISO/DIN)	T12112186
	Buchholz Indentation Tool	T12112187
	Buchholz Slip-On Weight	T12112188

Elcometer 195 Säberg Drill

For some coating/substrate combinations it is necessary to use a destructive method. Whereas a Paint Inspection Gauge (P.I.G.) makes a linear cut along the coating, the Elcometer 195 Säberg Drill makes a small hole in order to measure the coating thickness layer thus much less damage is done.

- Ideal for hard or brittle coatings
- Measures coatings up to 1500µm (60mils)
- Used in conjunction with a graticule scale microscope (included)

Model	Description	Part Number
Elcometer 195	Elcometer 195 Säberg Drill	A195---1A
Accessories	Spare 90° drill	T1955188-

Elcometer 126 & 3240 Dry and Wet Film Gauges

These easy to use gauges are designed to measure the thickness of a coating.

Dry film: The measurement of the difference in height between the surface of the coating and the bare surface of the substrate, given by 2 fixed resting points (or outer sleeve) and a central mobile sensor, indicates the thickness of the dry film.

Wet film: A knurled screw situated on the upper part of the gauge enables the travel of the probe to be varied over a height of 500µm until it touches the film. The difference between the resting points on the substrate and the probe indicates the film thickness.

Supplied with a glass reference/zero plate.

Can be used in accordance with:	
ASTM D 4138	BS 3900-C5-3
ISO 2808-3	NF T 30-122

Model	Description	Dial or Digital	Graduation	Range		Part Number
				µm	mils	
Elcometer 126	Elcometer 126 Dry Film Thickness Gauge	Dial	10µm	0-1000	-	E126B--M-
Elcometer 126	Elcometer 126 Dry Film Thickness Gauge - Imperial	Dial	0.4mils	-	0-50	E126B--E-
Elcometer 3240/2	Elcometer 3240 Dry Film Thickness Gauge	Dial	5µm	0-1000	-	K0003240M002
Elcometer 3240/3	Elcometer 3240 Dry Film Thickness Gauge	Dial	1µm	0-5000	-	K0003240M003
Elcometer 3240/6	Elcometer 3240 Dry Film Thickness Gauge with Data Output	Digital	1µm	0-5000	-	K0003240M006
Elcometer 3240/1	Elcometer 3240 Wet and Dry Film Thickness Gauge	Dial	5µm	0-500	-	K0003240M001

Coating Thickness Gauges – Destructive

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Corrosion
see pages 83-89

Hardness
see pages 47-54

Multi-Function Scratch Tester
see page 51

Inspection Accessories
see page 143

Pinhole & Porosity Detection
see pages 165-170

Adhesion

From the largest man-made structures to the smallest household appliances, most manufactured products have a protective or cosmetic coating. Premature failure of this coating can, at the very least, result in costly penalties or 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.

Elcometer offer a highly comprehensive range of Adhesion Gauges designed specifically to meet your requirements. The gauges can be split into three categories:

Cross Hatch/Cross Cut Method	The coating is cut into small squares, thereby reducing lateral bonding, and the adhesion assessed against ISO, ASTM or Corporate Standards.
Pull Off Adhesion Method	Tensile Dollies (or stubs) are glued to the coating and, when the adhesive has cured, the force required to pull the dolly off the surface is measured.
Push Off Adhesion Method	Similar to the Pull Off Adhesion Test, a dolly is glued to the coating. When the adhesive has cured, however, the dolly is pushed off the surface by the adhesion gauge.

HOW TO SELECT THE CORRECT ADHESION GAUGE

Cross Hatch Cutters
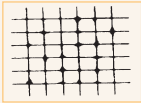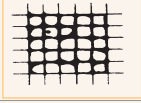
Advantages:	A fast, low cost, comparison method – see table below
Possible Limitations:	A subjective test for flat surfaces for a limited thickness range.
Applications:	For paint and powder coatings up to a thickness of 125µm (5mils)

Pull Off Adhesion Testers

Advantages:	Simple to use, quantitative range – giving you a definitive adhesion value
Possible Limitations:	Time required for some adhesives to cure
Applications:	Ideal gauge for the laboratory or field – flat or curved substrate applications

Push Off Adhesion Testers

Advantages:	Fast cure time adhesives can be used, ideal for curved surfaces
Possible Limitations:	High forces exerted by gauge may cause thin substrates to deform
Applications:	Pipelines and metal spray coatings

CLASSIFICATION OF CROSS HATCH ADHESION TEST RESULTS			
Description	Surface	BS/ISO/DIN	ASTM
The edges of the cuts are completely smooth, none of the squares of the lattice are detached	NONE	0 5	B
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 even be classified by classification 4/1B		5	0B

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Elcometer 1541 Single Blade Cutter

This instrument has a single-blade tool used to perform simple parallel or crossed cuts on plane or curved surfaces.

Model	Description	Part Number
Elcometer 1541	Elcometer 1541 Single Blade Cutter	K0001541M002

Elcometer 1540 Cross Cut Tester

Simple instrument for quickly determining the adhesion of a large variety of paints.
Made from special steel, it has 11 tapered teeth with 1mm spacing.
Two series of lines are cut at right angles to obtain a pattern of 100 squares.
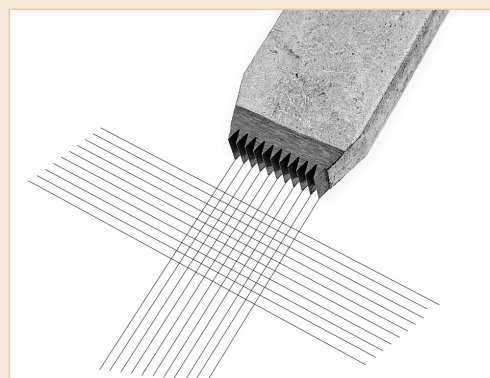
Can be used in accordance with:	
ASTM D 3359	BS 3900 E6
DIN 53151	DIN EN ISO NF 2409

Model	Description	Part Number
Elcometer 1540	Elcometer 1540 Cross Cut Tester 10 x 1mm	K0001540M001

Elcometer 1542 Cross Hatch Adhesion Tester

Simple but effective method for determining the adhesion of a large variety of coatings. The instrument is ideal for thin coatings on flat surfaces,
available with three different spacings, corresponding to the thickness of layer to be tested:

- 1mm spacing – for coating thickness less than 60μm
- 2mm spacing – for coating thickness less than 120μm
- 3mm spacing – for coating thickness more than 120μm

Three instrument types are supplied separately or combined in a kit case with standardized brush and magnifier.

- Powerful cross cutter, with 8 cutting faces.
- Anodized aluminium handle, with a wheel for stable operation, ideal for test panels and thin coatings
- Supplied with an adjustment gauge for accurate positioning of the cutter face

Can be used in accordance with:	
ASTM D 522	ASTM D 1737
BS 3900 E11	DIN EN ISO NF 6860
DIN EN ISO NF 2409	ECCA T6
ECCA T7	NF T 30-038
NF T 30-078	

Model	Description	Part Number
Elcometer 1542/1	Elcometer 1542 Cross Hatch Adhesion Tester 5 x 1mm	K0001542M001
Elcometer 1542/2	Elcometer 1542 Cross Hatch Adhesion Tester 5 x 2mm	K0001542M002
Elcometer 1542/3	Elcometer 1542 Cross Hatch Adhesion Tester 5 x 3mm	K0001542M003
Accessories	Elcometer 1542 6 x 1mm Cross Hatch Blade	KT001542P001
	Elcometer 1542 6 x 2mm Cross Hatch Blade	KT001542P002
	Elcometer 1542 6 x 3mm Cross Hatch Blade	KT001542P003
	Adjustment Gauge for Elcometer 1542	KT001542F006
	ASTM 03359 Adhesive Tape (2 rolls)	T1078894-
	ISO 2409 Adhesive Tape (2 rolls)	T1079358-

Elcometer 107 Cross Hatch Cutter

The coating may be continuous and look good, but how well is it connected to the substrate? The Elcometer 107 Cross Hatch Cutter provides an instant assessment of the quality of the bond to the substrate. Due to its rugged construction this gauge is ideal for thin, thick or tough coatings on flat or curved surfaces. An ideal field or laboratory test.

- Low cost
- Robust design
- Easy to change cutters
- Large, non slip grip
- Ideal for thick or hard coatings
- Large selection of cutters, each with four cutting faces
- Can be converted into the Elcometer 141 Paint Inspectors Gauge (P.I.G.)

The Elcometer 107 Cross Hatch Cutter is available in two versions.

- *The Basic Kit comes complete with:*
Robust handle, the cutter of your choice (see below), Allen Key (wrench), presentation storage case and instructions (together with the Classification of Adhesion Test Results Chart)

- *The Full Kit includes all that is supplied in the Basic Kit, and also includes:*
An eye glass, brush and adhesive tape (either ASTM or ISO tape), all in a plastic ABS carrying case.

Can be used in accordance with:	
ASTM D 3359-B	ASTM D 3002
BS 3900-E6	BS EN ISO 2409
DIN 53151	ISO 2409
NF T 30-038	

SELECTING THE APPROPRIATE TEST KIT				
Cutter	Number of Teeth	Part Number		
		Full Kit with ISO Tape	Full Kit with ASTM Tape	Basic Kit
1mm	6	F10713348-6	F10713348-1	F10713222-1
1mm	11	-	F10713348-2	F10713222-2
1.5mm	11	-	-	F10713222-3
2mm	6	F10713348-9	F10713348-4	F10713222-4
3mm	6	-	-	F10713222-5

SELECTING THE APPROPRIATE ELCOMETER 107 CUTTER						
Coating Thickness		Substrate Type	Cutting Teeth	Tooth/Slot Spacing	Test Method	Part Number
μm	mils					
0-50	2	Metal	11	1mm	ASTM D3359B	T10713700-2
0-60	2-4	Hard	6	1mm	BS EN ISO 2409	T10713700-1
0-60	2-4	Medium	11	1.5mm	-	T10713700-3
0-60	2-4	Soft	6	2mm	BS EN ISO 2409	T10713700-4
50-125	2-5	Hard and Soft	6	2mm	ASTM D3559B	T10713700-4
61-120	2.4-4.7	Hard and Soft	6	2mm	BS EN ISO 2409	T10713700-4
125-250	5-10	Hard and Soft	6	3mm	Quick Check Only	T10713700-5
Accessories		ASTM D 3359 Adhesive Tape (2 rolls)				T1078894-
		ISO 2409 Adhesive Tape (2 rolls)				T1079358-

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Elcometer 106 Pull off Adhesion Tester

The Elcometer 106 Adhesion Tester - easy to operate and fully portable, provides a numerical value for adhesion. Applications include: paint or plasma spray on bridge decking, coatings on steel, aluminium or concrete, etc.

- Comes in a carrying case – ideal for site tests
- Hand operated so you don't have to worry about a power supply!

Test Method

A test dolly is bonded to the coating using an adhesive.
The 106 houses a spring arrangement which applies a lift force to the dolly.

When the dolly is pulled off the surface, an indicator on the scale shows the numerical value of adhesion expressed in terms of the force required to remove the dolly.

Test from low adhesion values of 5-30PSI (0.05-0.2N/mm²) up to 500-3200PSI (5-22N/mm²)

For an approximate value in kg/cm² multiply N/mm² by 10.

Can be used in accordance with:	
ANSI N5.12	ASTM D 4541
BS EN 24624	ISO 4624
NF T 30-062	

The Elcometer 106 Adhesion Tester is available in 5 scale ranges, please take note of the appropriate adhesion value of the equipment before ordering.

Scale 1	Scale 2	Scale 3	Scale 4	Scale 5
(scale diagram)	(scale diagram)	(scale diagram)	(scale diagram)	(scale diagram)

Instrument Dimensions	Height: 152mm (6.0")		Diameter: 76mm (3.0")	
Dolly Size	Diameter: 20mm (0.76")		Area: 314mm² (0.5sq inch)	
Gross Weight of Kit in Case	Scales 1, 2 and 5: 2.1kg (4.7lb)		Scale 3: 3.4kg (7.5lb)	Scale 4: 3.6kg (8.0lb)

Model	Description	Range		Part Number
		N/mm²(MPa)	PSI	
Elcometer 106/5	Elcometer 106 Adhesion Tester – Scale 5	(0)-0.2	(0)-30	F106----5
Elcometer 106/1	Elcometer 106 Adhesion Tester – Scale 1	(0)-3.5	(0)-500	F106----1
Elcometer 106/2	Elcometer 106 Adhesion Tester – Scale 2	(0)-7	(0)-1000	F106----2
Elcometer 106/3	Elcometer 106 Adhesion Tester – Scale 3	(0)-15	(0)-2000	F106----3
Elcometer 106/4	Elcometer 106 Adhesion Tester – Scale 4	(0) -22	(0)-3200	F106----4
Accessories	Spare Dollies (Pack of 100)			T1062895-
	Large Dollies 40mm diameter (Pack of 5)			T1062914-
	Large Base Ring			T1062915-
	Araldite Epoxy Adhesive			T99912906

Elcometer 106/6 Coatings on Concrete Adhesion Tester

The Elcometer 106/6 Adhesion Tester has been specifically designed to measure coatings on concrete.

Operating in a similar way to the regular Elcometer 106 Adhesion Testers, the Elcometer 106/6 allows for a 50mm (2″) diameter dolly for testing coatings on concrete.
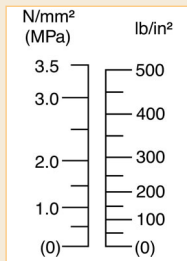
- Fully portable and comes in a carrying case – ideal for site tests
- Hand operated so you don't have to worry about a power supply!

Can be used in accordance with:	
ACI 503R	BS 1881 part 207

Model	Description	Range		Part Number
		N/mm²(MPa)	PSI	
Elcometer 106/6	Elcometer 106 Adhesion Tester – Scale 6	(0)-3.5	(0)-500	F106----6
Accessories	Spare Dollies (Pack of 5)			T10618570
	Araldite Epoxy Adhesive			T99912906

Elcometer 109 Tensile Adhesion Tester

The Elcometer 109 Push off Tensile Adhesion Tester provides the operator with a means of carrying out a simple pass/fail test of the adhesion of the coating against a specification limit.

- Non-destructive*
- Easy to use
- No calibration required
- Colour coded certified tensile dollies
- Robust and lightweight
- Adapter available for use with the PAT tester according to (Norwegian) NORSOK Standard M-501

*Non-destructive if coating is within specification and the tensile dolly breaks. Only a small button remains on the surface which can be sheared off.

Can be used in accordance with:	
ASTM D 4541	BS EN 24624
NORSOK M-501	

Assembled Pull-Off Unit Dimensions	Metric	Imperial
Height	150mm	6"
Width (including handle)	80mm	3"
Kit Weight	1.7kg	3.75lb

Description	Test Element Value	Accuracy	Colour Code	Part Number
Elcometer 109/1 Adhesion Tester	5MPa (725PSI)	±5%	Red	F109----1
Elcometer 109/2 Adhesion Tester	7MPa (1015PSI)	±5%	Blue	F109----2
Elcometer 109/3 Adhesion Tester	9MPa (1304PSI)	±5%	Yellow	F109---3
Accessories	5MPa Tensile Dollies (Pack of 25)			T10913952
	7MPa Tensile Dollies (Pack of 25)			T10913953
	9MPa Tensile Dollies (Pack of 25)			T10913954
	Araldite Epoxy Adhesive			T99912906

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Elcometer 108 Hydraulic Adhesion Testers

The Elcometer 108 is an extremely versatile hydraulic adhesion tester which will cope with many adhesion test requirements. Test can be made on flat or curved (concave and convex) surfaces.

A reusable stainless steel dolly is adhered to the coating's surface and the force required to push the dolly from the surface is applied using the handle. The value of the force applied is displayed either on a digital display or with an analogue dial. For areas susceptible to explosion (e.g. inflammable areas), the analogue version should be chosen.

The Elcometer 108 is the ideal gauge for coatings on Tanks, Pipelines, etc.

- Hand-powered and portable
- Ideal for site work
- Reusable stainless steel dollies
- Complete kit and carrying case

Elcometer Digital Adhesion Gauge Features include:

- Maximum hold – displays the highest value reached
- ±1% Reading accuracy
- Backlight display for dark areas
- Rubber protective casing
- Switchable Metric/Imperial units

The Elcometer 108 can be used with curved dollies, making this the gauge for adhesion on pipelines, tanks and other curved surfaces.

A wide range of curved dollies are available, each designed for a specific range of curvature. Convex (top illustration) and concave (bottom illustration) dollies are for use on external and internal curvatures respectively. For more information on curved dollies please contact Elcometer.
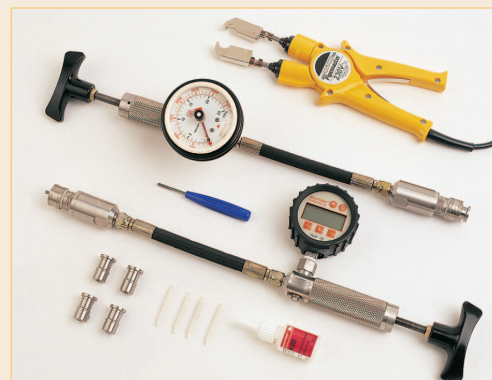
Can be used in accordance with:	
ASTM C 633	BS EN 24624
ISO 2063	
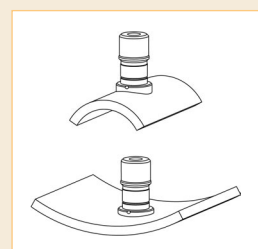
Dial Adhesion Gauge Range	Operating: 0-18MPa (0-2600PSI)		Full Scale: 0-25MPa (0-3500PSI)
Dial Pressure Gauge Accuracy	±0.5MPa (Metric Scale); ±50PSI (Imperial Scale)		
Digital Adhesion Gauge Range	Operating: 0-18MPa (0-2600PSI)		Full Scale: 0-34MPa (0-5000PSI)
Digital Pressure Gauge Accuracy	±1%		
Dolly Size	Outside Diameter	Inside Diameter	Area
	19.39mm (0.76")	3.73mm (0.15")	284mm² (0.44 sq. inch)

Each Elcometer 108 comes in a plastic ABS carrying case, containing:

- 5 Flat Dollies
- 5 Nylon Plugs
- M2000 Quick Curing Adhesive
- Dolly Cleaning Tool
- Heating Tongs to remove adhesive – allowing you to reuse the dollies

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 108/1	Elcometer 108 Hydraulic Adhesion Tester – Dial Gauge	F108---1A	F108---1B	F108---1C
Elcometer 108/2	Elcometer 108 Hydraulic Adhesion Tester – Digital Gauge	F108---2A	F108---2B	F108---2C
Accessories	M2000 Adhesive	T10811135		
	Standard Flat Dolly 20mm	T1089646-		
	Curved dollies – by request, contact Elcometer for further information			

Elcometer 110 Pneumatic Adhesion Tester

The Elcometer 110 Patti® is a portable pneumatic adhesion tester which uses compressed gas from either a canister or the compressed air feed.

Due to the controlled force being applied, the resultant adhesion value is highly repeatable. This provides the User with an ideal testing instrument.

- Simple to use
- Large LCD
- ±1% Accuracy*
- Repeatable and Reproduceable

The Elcometer 110 has a wide range of pistons, providing the User with a maximum adhesion test of 70MPa, 10,000PSI.

accuracy is dependent on the positioning of the dolly - ±1% when tested under factory conditions.

Can be used in accordance with:	
ASTM D 4541	BS EN 22063
BS EN 24624	

Gas Supply	Rechargeable internal reservoir via gas canister or internal air line
Power Supply	9V (PP3, 6F22)
Dimensions (of control module)	Height: 100mm (4") Width: 255mm (10^1/$_2$") Depth: 255mm (10^1/$_2$")
Weight	2.7kg (5.9lbs) without carrying case
Carrying Case	Padded nylon case with shoulder strap
Rate of Load Application	Adjustable up to 150PSI per second

Model	Description	Standard Piston Supplied*	Part Number
Elcometer 110/1	Elcometer 110 Pneumatic Adhesion Tester	F-1	F110----1
Elcometer 110/2	Elcometer 110 Pneumatic Adhesion Tester	F-2	F110----2
Elcometer 110/3	Elcometer 110 Pneumatic Adhesion Tester	F-4	F110----3
Elcometer 110/4	Elcometer 110 Pneumatic Adhesion Tester	F-8	F110----4
Elcometer 110/5	Elcometer 110 Pneumatic Adhesion Tester	F-16	F110----5
Elcometer 110/6	Elcometer 110 Pneumatic Adhesion Tester	F-20 (F8 and F12)	F110----6

*Except for the Elcometer 110/6, each unit comes complete with two pistons. The F-20 Piston is counted as 2 pistons (F8 and F12). When placing your order, please select the additional piston, using the appropriate part number below.
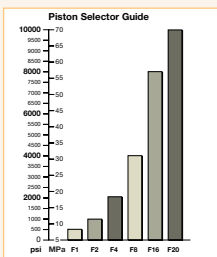
Piston	Load Range		Piston Diameter		Part Number
	MPa	PSI	mm	inches	
F-1	0-3.4	0-500	44.5	1.75	T11013400
F-2	0-6.9	0-1000	57	2.25	T11013401
F-4	0-13.8	0-2000	76	3	T11013402
F-8	0-27.6	0-4000	98	3.875	T11013403
F-16	0-55.2	0-8000	127	5	T11013404
F-20 (F8/F12)	0-70	0-10000	146	5.75	T11013405

Accessories			
	Pull Stubs (Pack of 25)		T11013388
	Araldite Epoxy Adhesive		T99912906

Elcometer 1910 PAT Handy Adhesion Tester

This lightweight, portable, hydraulic adhesion tester has built in hydraulic safety devices for smooth and drift proof accuracy.

The special test head allows adhesion tests on both internal and external curved surfaces, making this an ideal gauge for pipelines and protective coatings applications.

Can be used in accordance with:	
ASTM D 4541	EN 24624
ISO 4624	

Maximum Pull Force	6.3kN	Weight of Tester	1250g (45oz)
Accuracy	±1% of full scale	Case Dimensions	340 x 270 x 80mm (12 x 8 x 3")

The Elcometer 1910 is supplied complete with a Calibration Certificate and:

- Crank handle driven pull mechanism
- PAT Testing Head 6.3kN (1416lbf)
- 5 Test Elements – 20mm (0.79") Diameter
- HSS Cutting Tool for 20mm (0.79") Diameter Test Elements
- Hydraulic Cable
- Carrying Case with Protective Interior

Model	Description	Part Number
Elcometer 1910	Elcometer 1910 PAT Handy Adhesion Gauge	K0001910M001
For an Elcometer PAT Range Selection Guide and a complete range of Test Elements - See Page 163.		

Elcometer 1930 PAT MICRO Adhesion Tester AT101/1kN

This automatic tester has been designed specifically for testing in confined areas, particularly on small components of irregular and awkward shape, and with very low pull force.

Operating in a similar way to other pull off testers, a test element (dolly) is adhered to the coating. The testing head is connected to the element and the force required to remove it is recorded.

Can be used in accordance with:	
ASTM D 4541	EN 24624
ISO 4624	

Accuracy	±1% of full scale
Power	230/110V AC
Battery	Optional
Hydraulic System Drive	Two-step servo motor
Weight Complete in Case	8.2kg (18lb)
Case Dimensions	430 x 325 x 145mm (17 x 13 x 6")

The Elcometer 1930 is supplied in an aluminium carrying case, complete with a Calibration Certificate and:

- Automatic hydraulic pump unit with control display
- Adapter for mains power
- PAT Testing Head 1kN
- Hydraulic cable

Model	Description	Part Number
Elcometer 1930	Elcometer 1930 PAT MICRO Adhesion Tester – AT101/1kN	K0001930M001
For an Elcometer PAT Range Selection Guide and a complete range of Test Elements - See Page 163.		

Elcometer 1920 PAT Adhesion Tester AT101

This automatic adhesion tester – available through Elcometer Inc. – is designed for measuring the bond strength of all types of paints, thermal sprayed coatings, thin films, concrete coatings and much, much more, on any shaped substrate.

A dolly is adhered to the surface and once the test head is connected, a tensile force is applied. The rate of application can be adjusted by the User.

The Elcometer PAT AT101 is available in 6.3kN (1416lbf), 20kN (4496lbf), 40kN (8992lbf) and 80kN (17984lbf) versions.

- Portable and simple to use
- Produces comparable test results in the laboratory and on site
- Precision gauge with both MPa and PSI readings
- 110/230V mains power (battery power optional)
- All AT101 models can have a data logging module built in when new or retro-fitted into existing testing machine
- Supplied in a solid aluminium case

Can be used in accordance with:	
ASTM D 4541	ASTM C 633
EN 24624	ISO 4624

Accuracy	±1% of full scale	Hydraulic System Drive	Two-step servo motor
Power	230/110V AC	Weight Complete in Case	8.2kg (18lb)
Battery	Optional	Case Dimensions	430 x 325 x 145mm (17 x 13 x 6")

Elcometer 1920 PAT AT101 is supplied in an aluminium carrying case complete with a Calibration Certificate and:

- Automatic hydraulic pump unit with control display
- PAT testing head
- Hydraulic cable
- Adapter for mains power

Model	Description	Scale Range	Part Number
Elcometer 1920/1	Elcometer 1920/1 PAT Adhesion Tester – AT101	6.3kN, 1416lbf	K0001920M001
Elcometer 1920/2	Elcometer 1920/2 PAT Adhesion Tester – AT101	20kN, 4496lbf	K0001920M002
Elcometer 1920/3	Elcometer 1920/3 PAT Adhesion Tester – AT101	40kN, 8992lbf	K0001920M003
Elcometer 1920/4	Elcometer 1920/4 PAT Adhesion Tester – AT101	80kN, 17984lbf	K0001920M004

Elcometer 1980 PAT Coating Fracture Tester

Comprising of two cylinders of 25mm (1") diameter, the Elcometer 1980 is designed to measure the force required to fracture a coating.

One cylinder is coated with the sample coating, and the two cylinders are glued together.

The cylinders are then pulled apart in order to measure the pull stress (in Newton/mm^2 or PSI) required to fracture the coating.

Can be used in accordance with:
ASTM C 633

Model	Description	Part Number
Elcometer 1980	Elcometer 1980 PAT Coating Fracture Tester	K0001980M001

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Elcometer 1940 PAT 6.3kN Adhesion Tester

The most popular in the Elcometer PAT tester range, a manual hydraulic tensile adhesion tester for measuring the bond strength of all types of paints, thermal sprayed coatings, thin films, concrete coatings, ceramics, etc.

- Portable, precision gauge with both MPa and PSI readings
- Accurate and comparable test results both in the laboratory and on site
- Testing of coatings on any shaped substrates, e.g. inside and outside pipe surfaces

Can be used in accordance with:	
ASTM D 4541	ASTM C 633
EN 1542	ISO 4624

Maximum Certified Pull Force	6.3kN	Weight of Tester	1250g (45oz)
Accuracy	±1% of full scale	Case Dimensions	400 x 300 x 170mm (16 x 12 x 7")

The Elcometer 1940 is supplied in an aluminium carrying case, complete with a Calibration Certificate and:

- PAT GM01/6.3kN Hydraulic Pull-Force Pump
- PAT Testing Head 6.3kN
- 5 Test Elements – 20mm (0.79") Diameter
- HSS Cutting Tool for 20mm (0.79") Diameter Test Elements
- Hydraulic Cable

Model	Description	Part Number
Elcometer 1940	Elcometer 1940 PAT GM01/6.3kN Adhesion Tester	K0001940M001

Elcometer 1941 PAT 20kN & 40kN Adhesion Testers

A 20 or 40kN manual hydraulic tensile adhesion tester for testing of coatings (including thermal sprayed coatings), on test panels, sprayed components.

Designed for testing with 50mm (2") diameter test elements and with the square 50 x 50mm (2 x 2") test element for adhesion testing of tile adhesives and other cementitious materials.

The gauge, in conjunction with a test fixture, can also be used in accordance with ASTM-C633 (two test cylinders glued together).

- Portable and simple to use
- Produces comparable test results in the laboratory and on site
- Precision gauge with both MPa (N/mm^2) and PSI reading
- Testing of coatings, concrete tensile strength, ceramic tile adhesives, road surface materials, linings

Can be used in accordance with:	
ASTM D 4541	ASTM C 633
EN 1542	ISO 4624

Maximum Certified Pull Force	Elcometer 1941/1: 17kN Elcometer 1941/2: 34kN	Weight Complete in Case	11kg (24.25lb)
Accuracy	±1% of full scale	Case Dimensions	400 x 300 x 170mm (16 x 12 x 7")

The Elcometer 1941 is supplied in an aluminium carrying case, complete with a Calibration Certificate and:

- Hydraulic Pull-Force Pump
- Testing Head 20kN or 40kN (depending on gauge)
- Adapter for 50mm (2"), 70.7mm (2.78") and 50 x 50mm (2 x 2") diameter elements
- Quick Release Type Testing Head
- Testing Support Platform
- Hydraulic Cable

Model	Description	Part Number
Elcometer 1941/1	Elcometer 1941/1 PAT GM01/20kN Adhesion Tester	K0001941M001
Elcometer 1941/2	Elcometer 1941/2 PAT GM01/40kN Adhesion Tester	K0001941M002

Elcometer 1970 PFCV – Portable Field Calibration Verification Unit

For use with the Elcometer PAT, Elcometer 106, and Elcometer 108 Adhesion Testers, this Portable Field Calibration Verification Unit is ideal for confirming your adhesion gauge calibration.

Connect the appropriate pull stub to the unit, pull your adhesion tester and compare the adhesion tester reading to the reading on the Portable Calibration Unit's Display.

Calibration Range	0-17MPa (5.3kN) on 20mm (0.79") diameter dolly
Accuracy	Within ±1% if full scale
Instrument Weight	2.4kg (5.3lb)

Model	Description	Part Number
Elcometer 1970	Elcometer 1970 PFCV Unit	K0001970M001
Accessories	Elcometer 106 Adapter	KT001970P001
	Elcometer 108 Adapter	KT001970P002

ELCOMETER PAT RANGE SELECTION GUIDE AND TEST ELEMENTS

Element Number	Test Element Diameter		Range		Range Values Valid for the following Models	Part Number
	mm	inches	MPa	PSI		
TE001	2.3	0.09	160	23200	Elcometer 1930	KT001910P001
TE002	4	0.16	80	11600	Elcometer 1930	KT001910P002
TE003	5.7	0.22	40	5800	Elcometer 1930	KT001910P003
TE004	8.16	0.32	120	17400	Elcometer 1910, 1920/1, 1940	KT001910P004
TE005	14.1	0.55	40	5800	Elcometer 1910, 1920/1, 1940	KT001910P005
TE006	20	0.79	20	2900	Elcometer 1910, 1920/1, 1940	KT001910P006
TE007	25	0.98	40	5800	Elcometer 1920/2, 1941/1	KT001910P007
TE008	25	0.98	80	11600	Elcometer 1920/3, 1941/2	KT001910P008
TE009	25	0.98	160	23200	Elcometer 1920/4	KT001910P009
TE010	28.2	1.11	10	1450	Elcometer 1910, 1920/1, 1940	KT001910P010
TE011	40	1.57	5	725	Elcometer 1910, 1920/1, 1940	KT001910P011
TE012	50	2.0	3.2	460	Elcometer 1920/1, 1940	KT001910P012
TE013	50	2.0	10	1450	Elcometer 1920/2, 1941/1	KT001910P013
TE014	50	2.0	20	2900	Elcometer 1920/3, 1941/2	KT001910P014
TE015	50	2.0	40	7200	Elcometer 1920/4	KT001910P015
TE016	50 x 50	2.0 x 2.0	7.85	1140	Elcometer 1920/2, 1941/1	KT001910P016
TE017	50 x 50	2.0 x 2.0	15.7	2270	Elcometer 1920/3, 1941/2	KT001910P017
TE018	70.7	2.78	5	725	Elcometer 1920/2, 1941/1	KT001910P018
TE019	70.7	2.78	10	1450	Elcometer 1920/3, 1941/2	KT001910P019
TE020	70.7	2.78	20	2900	Elcometer 1920/4	KT001910P020

Adhesion

Amine Blush Check
see page 106

Corrosion
see pages 83-89

Elasticity & Resistance Deformation
see pages 55-57

Multi-Function Scratch Tester
see page 51

Surface Cleanliness
see pages 103-106

Surface Profile
see pages 97-101

Inspection Kits
see page 171

Pinhole & Porosity Detection

Premature corrosion of a substrate is usually due to the failure of the coating. A major cause of failure is the presence of flaws in the finished coating. Collectively referred to as a coating's porosity the main types of flaw are described below:

Runs and sags   The wet coating moves under gravity leaving a thin dry film.

Cissing   Occurs when a coating does not re-flow to cover the voids generated by air bubbles being released from the surface of a coating.

Cratering   Occurs when the substrate is wet or if the coating has poor flow characteristics, thus creating voids in the coating.

Pinholes   Caused either by air entrapment which is then released from the surface, or by the entrapment of particulates (dust, sand, etc.) which do not stay in place.

Over coating   If too much coating is applied to a substrate, as the coating cures it can crack from internal stresses of the coating.

Under coating   Areas are not coated or the coating flows away from particular edges, corners of a substrate and welds. Furthermore, over a rough surface profile, insufficient coating may leave the profile's peaks exposed.

The consequent cost of repairs and subsequent loss of production can be considerable. Early inspection for coating flaws will prevent the expense and inconvenience of a coating failure. Instruments used to detect coating flaws are referred to by many different names, these include spark or jeep testers, porosity or holiday detectors and pinhole testers.

There are two methods of testing:

Wet Sponge Technique   Suitable for measuring insulating coatings on metal less than 500μm (20mils) on conductive substrates. The wet sponge technique is ideal for powder coatings and any thin coating where the User does not wish damage to occur to the coating.

A low voltage is applied to a sponge, moistened with a wetting agent. When the sponge moves over a coating flaw, liquid penetrates to the substrate and completes an electrical circuit, setting off the alarm.

This technique will identify coating flaws where the substrate is uncovered, i.e. cissing, cratering, pinholes and some forms of over and under coating flaws.

High Voltage Technique   Locates all flaws in insulating coatings on conductive substrates, the high voltage technique can be used to test coatings up to more than 7mm (275mils) thick. This method is ideal for inspecting pipelines and other protective coatings. Coatings on concrete can also be tested using this method.

A power supply generates a high DC voltage which is connected to a suitable probe with an earth return connected to the substrate. As the probe is passed over the coated substrate, a flaw is indicated by a spark at the contact point which sets off the alarm.

This technique is suitable for identifying all of the flaws described above, however care is required on thin coatings.

Elcometer 270 Pinhole Detectors

The Elcometer 270 range utilises the wet sponge technique and has been designed to set a new standard for wet sponge detectors - namely, a high quality, low voltage detector with similar accessories to a high voltage spark tester.

- Supplied ready to use
- Automatic voltage calibration and voltage checks
- Low battery indicator
- Visual and audio alarms
- Integral and separate wand functionality
- A wide range of fully interchangeable wand accessories – see page 167
- 4 model variants in single, dual or triple voltages
- Easy release snag proof cables
- Large standard sponge
- Available in an inspection kit for all your inspection requirements

Can be used in accordance with:	
BS 1344-11	BS 7295-1
BS EN ISO 8289 A	BS 7793-2
NACE RP0188	

Measurement Range	9V Setting	300 microns (12mils)
	67.5V Setting	500 microns (20mils)
	90V Setting	500 microns (20mils)
Sensitivity	9V Setting	90 kohm ±5%
	67.5V Setting	125 kohm ±5%
	90V Setting	400 kohm ±5%
Accuracy of Voltage Settings	±5%	
Dimensions	Unit without Wand	210 x 42 x 37mm (8.3 x 1.7 x 1.5")
	Standard Wand Assembly	175mm (6.9") long with sponge
	Flat Sponge Size (approximate)	150 x 60 x 25mm (6 x 2.4 x 1")
Weight – including wand assembly, cable and batteries	610g (21oz)	
Battery Type	3 x AA (LR1600) 1.5V Alkaline (NiMH rechargeable batteries can also be used, battery life will be reduced by up to 75%)	
Battery Life (approximate)	9V Setting	200 hours of continuous use
	67.5V Setting	100 hours of continuous use
	90V Setting	80 hours of continuous use
Shipping List	Elcometer 270 of Specified Voltage, Standard Wand Assembly (Flat Sponge), 4m (13') Signal Return Cable, 3 x AA Batteries and Instruction Book.	

Model	Description	Part Number
Elcometer 270/1	Elcometer 270 Pinhole Detector 9V	D270----1
Elcometer 270/2	Elcometer 270 Pinhole Detector 67.5V	D270----2
Elcometer 270/3	Elcometer 270 Pinhole Detector 9V and 90V	D270----3
Elcometer 270/4	Elcometer 270 Pinhole Detector 9, 67.5 and 90V	D270----4
Accessories	See Page 167 for a complete range of Elcometer 270 accessories.	

ELCOMETER 270 ACCESSORIES		
Elcometer have developed a range of accessories for the Elcometer 270 enhancing the versatility of the instrument and the range of applications for which it can be used.		

	Description	Part Number
	Roller wand and roller sponge	T27016960
	Spare roller sponge set	T27018051
	Standard wand with flat sponge	T27016867
	Spare rectangular sponges 150 x 60 x 25mm (6 x 2.3 x 1") - pack of 3	T27018050
	Wetting agent 50ml (1.7fl oz)	T27018024
	Handle, lead and belt clip to make a separate wand	T27016999
	Telescopic handle with lead and belt clip - extends to 1m (39")	T27016998
	420mm (16.5") extension piece	T27016965
	10m (32.5') signal return cable and storage drum	T27016996
	Consultants carrying case complete with: 1 x Separate wand handle and lead, 1 x Roller wand, 1 x 10m Signal return cable 2 x Extension pieces, 1 x Telescopic extension, 1 x Belt clip, 1 x Bottle of wetting agent 3 x AA spare batteries, 1 x Spare flat sponge, 1 x Spare roller sponge	T27018191
	THIS INSPECTOR'S KIT DOES NOT INCLUDE MAIN INSTRUMENT, SIMPLY ADD YOUR MODEL NUMBER TO THE ORDER TO COMPLETE THE KIT.	
	This kit case is also available as an empty case	T27018025

elcometer®

Elcometer 236 DC Holiday Detectors

The premature corrosion of a substrate is often due to the failure of its coating. Major causes of failure are flaws in the finished coating, these include pinholes, holidays, inclusions, thin spots and bubbles.

The Elcometer 236's convenient carrying case allows the probe handle and accessories to be attached to the front making the Elcometer 236 ideal for field, site or laboratory inspection.

An accessory pouch, which accommodates the additional rechargeable battery (optional) can also be attached to the soft carrying case - thereby extending inspection time without the need for recharging the unit.

- Simple to use
- Robust and fully portable
- Audio and visual alarms – for noisy environments
- Supplied with a band brush probe
- Full set of probe accessories - see pages 169-170
- Digital display of output voltage or current
- Adjustable sensitivity
- 15kV and 30kV options available with fully adjustable output voltage
- Low weight 1.8kg (4lb)

The Elcometer 236 is available in two versions: 1-15kV and 2-30kV.
Each unit provides the User with complete control of voltage and sensitivity settings.
Due to the method of operation, the Elcometer 236 minimises the risk of additional damage to a coating and avoids the danger of coating popping off the surface which can occur with some high voltage systems.

Convenient Kit Case

The Elcometer 236 DC Holiday Detector is supplied as a complete kit, allowing the User to begin testing immediately after charging the unit.

The kit is supplied in a hard backed transit case for transportation and long term storage.

Can be used in accordance with:	
ANSI/AWWA C 214-89	ANSI/AWWA C 214-91
AS 3894.1	ASTM D 4787
ASTM G 6	ASTM D 5162
ASTM G 62-B	BS 1344-11
ISO 2746	JIS G-3491
JIS-G 3492	NACE RP0274;
NACE RP0490-2001	NACE RP0188-88`
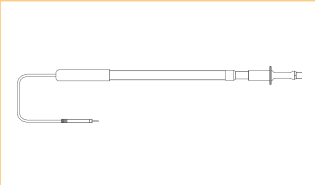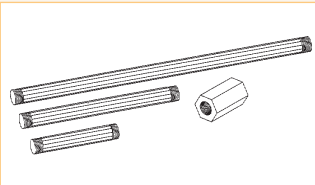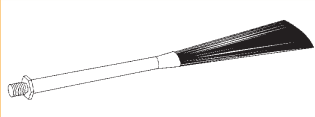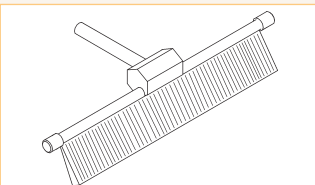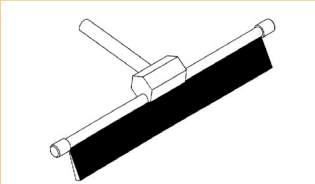
	15kV	30kV
Accuracy of Voltage Setting	±5% or ±0.2%kV	
Display Resolution	0.01kV	0.1kV
Range of Coating Thickness	0-3.75mm (approximate) 0-150mils (approximate)	0-7.5mm (approximate) 0-300mils (approximate)
Voltage Output	0.5-15kV in 100V steps	0.5-30kV in 100V steps
Alarms	Audio & Visual	
Power Supply	NiMH 12V internal rechargeable battery	
Battery Life (approximate)	10/12 hours continuous use, the optional external battery pack can increase this to 20/24 hours of continuous use	
Unit Dimensions	200 x 170 x 70mm (6 x 7 x 3")	
Product Weight (including case & probe)	2.8kg (6lb 3oz)	
Shipping List	Elcometer 236, Probe Handle and Lead, Band Brush Probe, 2m and 10m Signal Return/Earth Leads, Battery Charger, Carrying Case, Transit Case and Instruction Book	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 236/15	Elcometer 236 High Voltage Holiday Detector – 1-15kV	D236--15A	D236--15B	D236--15D
Elcometer 236/30	Elcometer 236 High Voltage Holiday Detector – 2-30kV	D236--30A	D236--30B	D236--30D
Accessories	External Battery Pack	T23615550		

See Pages 169-170 for a complete range of Elcometer 236 Probe Accessories.

ELCOMETER 236 PROBE ACCESSORIES

The Elcometer 236 has a wide range of accessories for your requirements. If you do not see the accessory that you require, please contact Elcometer.

TELESCOPIC PROBE HANDLE

Glass fibre and fully insulated behind the ring, this low cost telescopic probe handle allows the User to reach high areas from the ground or a platform. Using a simple twist and lock procedure the user can extend the handle to any length between the minimum and maximum.

Description	Part Number
Telescopic Probe Handle 0.6-1.2m (2-4')	T236155971
Telescopic Probe Handle 1.8-3.6m (6-12')	T236155972

EXTENSION PIECES

To extend the probe for applications where a long reach is required, ideal for internal pipe inspection. Screw the two pieces into the coupling piece and extend as far as you need to.

Description	Part Number
Probe Extension Piece 250mm (9.8")	T2362663A
Probe Extension Piece 500mm (19.7")	T2362663B
Probe Extension Piece 1000mm (39.4")	T2362663C
Coupling Piece – to link Extension Pieces together	T2362666-

BAND BRUSH PROBE

Provided as standard when an Elcometer 236 is purchased, it is an ideal accessory for complex shapes, small products and for accessing drill holes, eyes, etc

Description	Part Number
Band Brush Probe	T2362669-

RIGHT ANGLE WIRE BRUSH PROBES

Manufactured out of Phosphor Bronze these wire brush probes are ideal for testing large, flat surfaces. A range of widths is available.

Description	Part Number
Right Angle Wire Brush Probe – 250mm (9.8")	T23638071
Right Angle Wire Brush Probe – 500mm (19.7")	T23638072
Right Angle Wire Brush Probe – 1000mm (39.4")	T23638073
Replacement Wire Brush – Electrode only – 250mm (9.8")	T23626621
Replacement Wire Brush – Electrode only – 500mm (19.7")	T23626622
Replacement Wire Brush – Electrode only – 1000mm (39.4")	T23626623

RIGHT ANGLE CARBON INFUSED RUBBER PROBES

Ideal for testing large, flat surfaces with either thin or delicate coatings. A range of widths is available.

Description	Part Number
Right Angle Rubber Probe – 250mm (9.8")	T23638081
Right Angle Rubber Probe – 500mm (19.7")	T23638082
Right Angle Rubber Probe – 1000mm (39.4")	T23638083
Replacement Rubber – Electrode only – 250mm (9.8")	T23626731
Replacement Rubber – Electrode only – 500mm (19.7")	T23626732
Replacement Rubber – Electrode only – 1000mm (39.4")	T23626733

ELCOMETER 236 PROBE ACCESSORIES (continued)

EXTERNAL PIPE ROLLING SPRING PROBES

Designed specifically to test coatings on the external diameter of pipes. A range of external diameters is available.
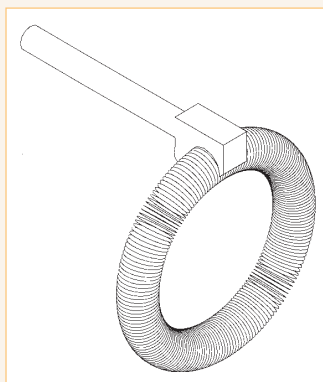
Diameter		Part Number	
mm	Inches	Full Assembly *Spring, Holder & 250mm Extension Piece*	Spring only
50	2	T2362649A	T2366197A
75	3	T2362649B	T2366197B
100	4	T2362649C	T2366197C
150	6	T2362649D	T2366197D
200	8	T2362649E	T2366197E
250	10	T2362649F	T2366197F
300	12	T2362649G	T2366197G
350	14	T2362649H	T2366197H
400	16	T2362649I	T2366197I
450	18	T2362649J	T2366197J
500	20	T2362649K	T2366197K
600	24	T2362649L	T2366197L
750	30	T2362649M	T2366197M
1000	36	T2362649N	T2366197N

INTERNAL PIPE WIRE BRUSH PROBES

Designed specifically to test coatings on the internal diameter of pipes. A range of internal diameters is available.
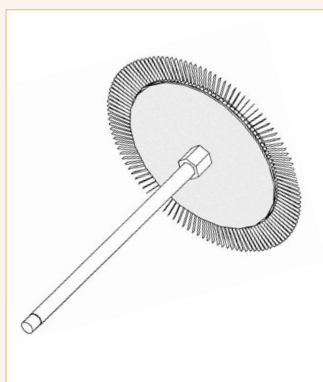
Diameter		Part Number	
mm	Inches	Full Assembly *Spring, Holder & 250mm Extension Piece*	Spring only
38	1.5	T2363907A	T2363766-
51	2.0	T2363907B	T2363767-
64	2.5	T2363907C	T2363768-
76	3.0	T2363907D	T2363769-
89	3.5	T2363907E	T2363770-
102	4.0	T2363907F	T2363771-
114	4.5	T2363907G	T2363772-
127	5.0	T2363907H	T2363773-
152	6.0	T2363907I	T2363774-
203	8.0	T2363907J	T2363775-
254	10.0	T2363907K	T2363776-
305	12.0	T2363907L	T2363777-

EXTERNAL SURFACE PIPE TESTING KIT

The Elcometer Pipe Testing Kit has been created to allow the pipeline inspector to create probes for non standard pipe sizes.

Each kit allows the User to create either 1 external spring for use on a 635mm (25") diameter pipe or up to 3 springs of User defined diameters.

Larger diameters can be made by connecting additional spring lengths together.
Spring lengths can be purchased separately using the part numbers listed above.

Description	Part Number
Pipe Testing Kit	T23615579

Coating Inspection Kits

Site inspection requires a range of portable testing equipment. In order to make these products easily available and transportable, Elcometer have developed a range of Coating Inspection Kits. All the gauges are conveniently stored in one hard plastic protective carrying case and are supplied with full operating instructions.

Elcometer Inspection Kit 1

Kit 1 comes complete with:
- Foil Gauge with Coarse and Extra Coarse Testex Tape
- Sling Hygrometer and Dewpoint Calculator
- Surface Contact Digital Thermometer
- Stainless Steel Precision Hexagonal Wet Film Comb
- Elcometer 456 Ferrous Basic Integral Probe Coating Thickness Gauge (0-1500µm, 0-60mils/thou)

Model	Description	Part Number	
		Metric	Imperial
Kit 1	Elcometer Inspection Kit 1	Y999KIT-1M	Y999KIT-1E

Elcometer Inspection Kit 2

Kit 2 comes complete with:
- Foil Gauge with Coarse and Extra Coarse Testex Tape
- Sling Hygrometer and Dewpoint Calculator
- Surface Contact Digital Thermometer
- Stainless Steel Precision Hexagonal Wet Film Comb
- Elcometer 456 Ferrous Standard Integral Probe Coating Thickness Gauge (0-1500µm, 0-60mils/thou), including EDTS$^+$ Software and Transfer Cable
- Cross Hatch Adhesion Gauge with either ISO or ASTM Adhesive Tape

Model	Description	Part Number	
		Metric	Imperial
Kit 2	Elcometer Inspection Kit 2	Y999KIT-2M	Y999KIT-2E

Elcometer Inspection Kit 3

Kit 3 comes complete with:
- Foil Gauge with Coarse and Extra Coarse Testex Tape
- Digital Surface Profile Gauge
- Elcometer 319 Digital Dewmeter – includes surface contact and air temperature probes
- Stainless Steel Precision Hexagonal Wet Film Comb
- Elcometer 456 Ferrous Standard Separate Probe Coating Thickness Gauge (0-1500µm, 0-60mils/thou), including EDTS$^+$ Software and Transfer Cable
- Cross Hatch Adhesion Gauge with either ISO or ASTM Adhesive Tape

Model	Description	Part Number	
		Metric	Imperial
Kit 3	Elcometer Inspection Kit 3	Y999KIT-3M	Y999KIT-3E

If the kit that your require is not listed above, Elcometer will be happy to discuss your requirements and develop one to suit your particular needs. Alternate Elcometer 456 Coating Thickness Gauges or scale ranges can be substituted in any kit upon request.

Publications

Elcometer offers a range of inspection and visual comparison manuals specifically for the coatings inspector.

Elcometer also provides a range of pictorial surface standards for blast cleaning incorporating standards for ISO, BS, SIS, ISO and SSPC – see page 106 for information.

Elcometer Protective Coatings Inspection Manual

Formerly known as the Paint Inspectors Manual, the Elcometer Protective Coatings Inspection Manual is your essential guide to the complex world of protective coatings inspection, application, materials, defects, corrosion theory and much more.

Easy-to-read, clearly designed, comprehensive and available in both English and Spanish, the manual is a high quality publication written and edited by Mr. Brendan Fitzsimons, an industry recognised expert in the field and a qualified NACE Senior Corrosion Technologist, Coatings Inspector and Protective Coatings Specialist.

There are over 100 full colour photographs throughout the 13 sections of the manual and, to meet reader requests, these are available as 35mm slides, making the PCIM an ideal training and presentation aide.

The Manual has already achieved worldwide readership and is a practical, authoritative guide intended for:

- Painting Contractors
- Paint Manufacturers
- Corrosion, Materials and Maintenance Engineers
- Coating Consultants
- Painting Inspectors
- Professional Training Schools and Industry/Technical Colleges

Key Features:

- Convenient ring binder format, divided into 9 standard sections, including glossary and technical appendices
- Comprehensive - Including sections on corrosion theory and other special features such as a Job Estimation format for accurate assessments
- Fully illustrated with colour photographs
- Four optional extra sections
- Endorsed by The Institute of Corrosion

The Elcometer Protective Coatings Inspections Manual contains 9 sections as standard. 4 optional sections are also available.

1. Introduction
2. Painting Inspector's Duties
3. Ambient Conditions
4. Surface Preparation
5. Paint and Paint Application
6. Metal Coatings
7. Health and Safety
8. Glossary of Terms
9. Appendices
10. Coating and Surface Defects – optional
11. Paint Materials – optional
12. Paint Testing – optional
13. Marine Coating Inspection - optional

Description	Part Number
Elcometer Protective Coatings Inspection Manual – Second Edition, Parts 1-9 including binder	H99912271
Part 10 - "Coating and Surface Defects"	H99912459
Part 11 - "The Nature of Paint"	H99913200
Part 12 - "Paint Testing"	H99913201
Part 13 - "Marine Coatings Inspection"	H99913202
To order any of the above in Spanish, simply add "-4" to the Part Number.	
Presentation Slides: Parts 1-9	T99912451
Presentation Slides: Part 10	T99912452
Upgrade from First Edition (Original English Manuals Only)	H99913199

Elcometer Visual Comparison Manual

The Visual Comparison Manual is handy, pocket-sized and illustrates in full colour application and coating defects. It contains good quality photographs, coated for protection.

Each photograph is referenced making it easy to locate the defect type and its associated cause or causes.

The manual is ideal for on-site assessment surveys as well as future recoating work, writing reports and specification review work.
Printed in three languages: English, German and Spanish

- 12 pre-surface condition photographs
- 64 application and coating defect photographs
- Ideal for technical presentations
- Table of defects - type, description and causes

Description	Part Number
Elcometer Visual Comparison Manual	H99915520

Elcometer Fitz's Atlas of Coatings Defects

Incorporating all the key features and benefits of the Visual Comparison Manual, the Elcometer Fitz's Atlas of Coating Defects (EFA) takes the reader through a more comprehensive range of problems and discusses each in detail.

EFA provides the User with a greater understanding of the defect, the probable cause and the possible solutions. With in excess of 180 colour photographs, the User can quickly gain an insight into the coatings industry and the pitfalls to watch out for.

Sections include: Welding Faults, Surface Conditions, Dry Abrasive Blasting, Water Jetting, Coating Defects and Marine Fouling Classifications.
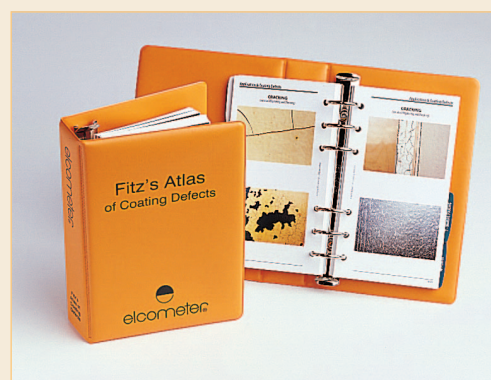
Description	Part Number
Elcometer Fitz's Atlas of Coating Defects	H99916043

Elcometer Macaw's Pipeline Defects

The aim of this publication is to illustrate the range of defects that may be encountered in high pressure steel pipelines and pipeline coatings.

The manual gives advice on the probable cause and significance of the defects and comments on appropriate remedial actions.

The defects included in this book encompass all aspects of high pressure steel pipeline manufacture, construction and operation, together with sections on coating and cathodic protection defects and examples of how defects interact to generate new or modified risks to pipeline integrity.
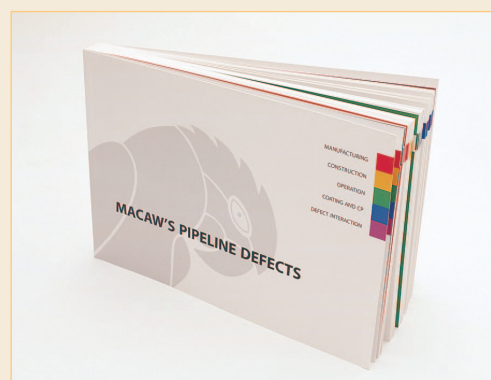
Description	Part Number
Elcometer Macaw's Pipeline Defects	H99918572

Inspection Accessories

During inspection, sometimes the substrate or coating requires closer investigation. In dark or shaded areas, such as in ballast tanks or large production sites, etc., further investigation may require additional light.

It may be necessary to take a detailed look at a specific area where you cannot get to. In this case an inspection mirror is required. For close up investigations the inspector may require magnification of the surface for a clearer understanding.

Elcometer 132 Safety Torch/Flash Light

Many environments can have low light or dark areas; ballast tanks, oil and gas tanks, etc. It is imperative, not only for safety reasons but also to be able to inspect the coating adequately, to have sufficient light.

The Elcometer 132 Safety Torch/Flash Light is explosion proof and meets the ATEX directive as category 2 equipment. It is approved to the latest EN Standards for electrical apparatus for potential explosive atmospheres.

This allows use in Group II applications zones 1 and 2, IIA and IIB gases, where T4 temperature class permits.

Model	Description	Part Number
Elcometer 132	Elcometer 132 Safety Torch/Flash Light	H132---1A

Elcometer 131 Inspection Mirrors

Inspection mirrors are ideal for inspecting difficult to access areas - inside pipes, behind corners, underneath inspection tanks and other inaccessible or awkward areas.

Mirrors are therefore an essential part of the inspector's equipment. 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.

Model	Description	Part Number
Elcometer 131/1	Telescopic inspection mirror which extends from 350mm (14") to 1400mm (55"). Mirror diameter is 63mm (2.5")	H131---1A
Elcometer 131/2	An illuminated inspection mirror. Its flexible stem is useful when examining hidden areas. Mirror diameter is 63mm (2.5")	H131---2A

Elcometer 137 Illuminated Magnifier

From time to time a closer inspection of a surface is required to ascertain the exact conditions of the material profile, cleanliness etc.

Furthermore, many environments can be in low light or dark areas - ballast tanks, oil and gas tanks, etc. The Elcometer 137 Illuminated Magnifier is the ideal product for the job.

- Light, battery powered, portable magnifier
- Ideal for comparison with surface comparators
- x10 magnification for close surface inspection
- Scaled lens for easy measurement of surface features

Model	Description	Part Number
Elcometer 137	Elcometer 137 Illuminated Magnifier	H137----1

Elcometer 7210 Pocket Microscope

The Elcometer 7210 is pocket size and an extremely practical microscope for site inspections.

Having x30 magnification and a built-in light source, the Elcometer 7210 Pocket Microscope is the ideal choice for close up investigation of coating defects and surface cleanliness.

Model	Description	Part Number
Elcometer 7210	Elcometer 7210 Pocket Microscope	KT007210M001

Elcometer 7220 Microscope with Reticules

A small robust handy microscope with battery operated removable lighting unit.

Different magnifications are available with scales graduated in mm.

Ideal for surface inspection and crack width determination.

- x20; 0.1mm graduations
- x60; 0.02mm graduations
- x200; 0.002mm graduations
- x40; 0.05mm graduations
- x100; 0.01mm graduations
- x300; 0.001mm graduations

Model	Description	Magnification	Part Number
Elcometer 7220/1	Microscope with Graduated Reticule	x20	K0007220M001
Elcometer 7220/2	Microscope with Graduated Reticule	x40	K0007220M002
Elcometer 7220/3	Microscope with Graduated Reticule	x60	K0007220M003
Elcometer 7220/4	Microscope with Graduated Reticule	x100	K0007220M004
Elcometer 7220/5	Microscope with Graduated Reticule	x200	K0007220M005
Elcometer 7220/6	Microscope with Graduated Reticule	x300	K0007220M006

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by elcometer

Elcometer 900 Concrete Crack Microscope

This very simple graduated x50 magnification microscope is an ideal gauge for measuring the size of cracks in concrete.

With its internal illumination the User can quickly determine the crack width by counting the number of graduations and calculating the value.

Model	Description	Part Number
Elcometer 900/1	Elcometer 900 Concrete Crack Microscope – Metric	W90018568-M
Elcometer 900/2	Elcometer 900 Concrete Crack Microscope – Imperial	W90018568-E

Elcometer 143 Crack Width Ruler

This simple gauge has been designed to provide inspectors with a low cost alternative to a graduated microscope for determining the width of a crack in concrete or other building materials.

Similar in size to a standard credit card, this transparent gauge is marked with a range of graded lines. Each line is a specified width.

To use, position the gauge over the crack and identify which line is of similar width to the crack. Read off the width value.
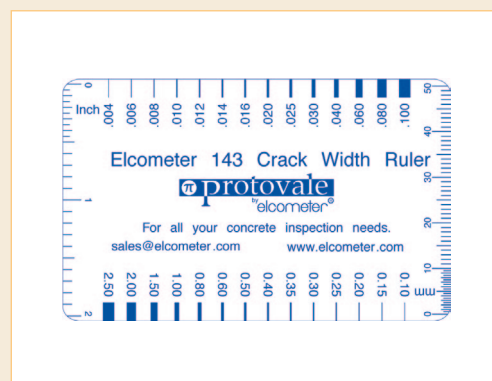
Model	Description	Range		Part Number
		mm	inches	
Elcometer 143	Elcometer 143 Crack Width Ruler	0.08-1.50	0.003-0.060	E143----1

Elcometer Galvanising Calculator

This simple calculator has been designed to help coating inspectors in the galvanising industry to convert the thickness of the zinc coating into the weight per unit area.

Values displayed in both Metric and Imperial.

- Metric: µm/grams per square metre
- Imperial: mils/ounces per square foot
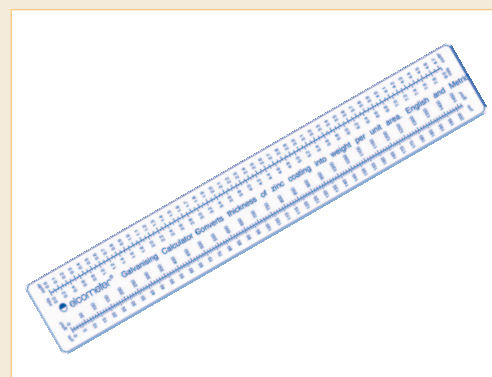
Description	Range		Part Number
	Metric	Imperial	
Elcometer Galvanising Calculator	203µm : 1450gm^2	8.0mils : 4.7oz ft^2	T95018569

Rebar Locators & Concrete Covermeters

Locating steel reinforcement bars and metal pipes is essential in the construction and maintenance of structures. Damage caused when a drill or a fastener makes contact with a pipe is costly. A drill making contact with rebar, however, not only destroys the drill bit but could seriously weaken the rebar, leading to serious structural damage.

Before carrying out any maintenance work, it is vital to identify the location, orientation and depth of sub-surface metalwork.

Rebar Locators　Designed specifically to identify the location and orientation of reinforcement bars and other sub-surface metal objects.

Covermeters　Designed primarily to indicate the depth of concrete cover at a given point over reinforcement bars and other sub-surface metal objects. Additional functionality within the Elcometer range of covermeters includes rebar location, orientation and bar size (diameter) determination.

Elcometer P100 Imp Rebar Locator

The Elcometer P100 is a robust and economical gauge designed to identify the location and orientation of reinforcement bars, metal gas and metal water pipes.

Mild steel and stainless steel galvanised wall ties can also be found with the addition of an optional Search Coil (or probe).

Simple to use, the Elcometer P100 is supplied in an ABS plastic carrying case together with a 100mm (4") search coil and batteries.

- *Fast and accurate* - gives a loud audible signal when the exact location of the rebar has been found.
- *Directional Search field* - distinguishes between horizontal and vertical bars – see diagram.
- *No need to re-zero* - Unaffected by moisture, temperature changes and electrical interference.

Maximum Signal　　Minimum Signal
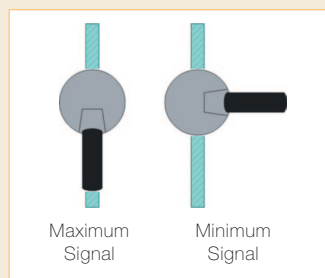
DETECTION RANGES FOR SINGLE REINFORCEMENT BARS			
Rebar Diameter		Detection Depth	
mm	inches	mm	inches
8	0.32	90	3.5
16	0.63	100	3.9
32	1.25	110	4.3

Model	Description	Part Number
Elcometer P100	Elcometer P100 Imp Rebar Locator	W100157A9D
Accessories	100mm (4") Directional Search Coil for Rebar	TW999198F
	200mm (8") Hi-Depth Locator Search Coil - Short-handled (250mm/9.8")	TW999198G
	200mm (8") Hi-Depth Locator Search Coil - Long-handled (650mm/25.5")	TW999198H

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Adhesion *(coatings on concrete)*
see pages 153-163

Coating Thickness – Destructive *(coatings on concrete)*
see pages 149-151

Coating Thickness – Digital *(coatings on rebar)*
see pages 130-142

Salt Contamination *(salt in concrete)*
see pages 103-106

Inspection Accessories
see pages 174-176

Pinhole & Porosity Detection *(coatings on concrete)*
see pages 165-170

Wall Tie and Stud Locators
see pages 185-186

Elcometer P120 Rebar Locator

The Elcometer P120 Rebar Locator is perhaps the easiest and fastest way of detecting reinforcing bars in concrete.

Widely used before coring or drilling holes to find "safe spots", the Elcometer P120 will not only indicate the rebar's location and direction but will also give an indication of the depth of concrete cover.

Designed in collaboration with the construction industry, the Elcometer P120 is an accurate, reliable, easy to use steel rebar locating instrument, built to last.

Available in both metric and imperial, the Elcometer P120 is supplied together with a 100mm (4") search coil, leather case and batteries.
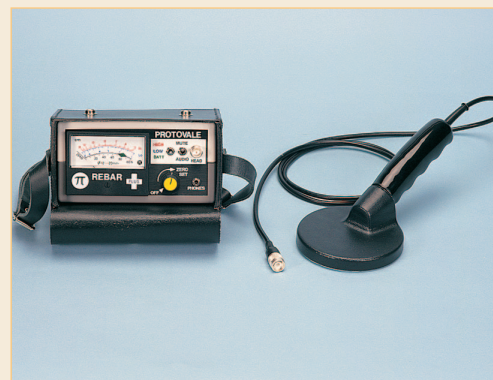
- *Fast, accurate and stable* - A loud audio tone and a clear analogue meter for quick accurate scanning. There is no need to keep zeroing the instrument during use.

- *High resolution controlled field search head* - The strongest signal is in the centre of the search head so the Elcometer P120 is accurate even when working at very close reinforcement bar centres or near metal objects, for example close to scaffolding or metal window frames.

- *Versatile instrument* - Supplied with a standard 100mm (4") head it will also accept the 150mm (6") head and the Borehole probe for locating rebars and locating tendon ducts at great depths (see page 184).

- *Highly directional detection field* - The Elcometer P120 can quickly and easily distinguish between horizontal and vertical bars – see diagram below.

- *Headphone socket* - Clearly detect the rebar in noisy environments.

- *Clear Instrument Panel* - High quality meter also shows signal strength and battery state.

Maximum
Signal

Minimum
Signal
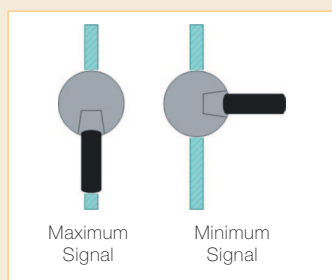
Identification and orientation of the bar

The Elcometer P120 can distinguish between horizontal and vertical bars.

After locating the steel reinforcement bars in the concrete, rotate the rebar locator's search coil (probe) until the maximum and minimum signals are found.

The maximum signal indicates the bar is running parallel to the search coil's handle, the minimum signal indicates that the bar is running at 90º to the search coil's handle – see diagram.

DETECTION RANGES FOR SINGLE REINFORCEMENT BARS					
Rebar Diameter		Detection Depth		Resolution of Parallel Bars	
mm	inches	mm	inches	mm	inches
8	0.32	120	4.72	60mm pitch at up to 35mm	2.36" pitch at up to 1.37"
16	0.63	140	5.50	75mm pitch at up to 50mm	2.95" pitch at up to 1.97"
32	1.25	160	6.30	150mm pitch at up to 85mm	5.90" pitch at up to 3.35"

Model	Description	Part Number
Elcometer P120/1	Elcometer P120 Rebar Locator - Metric	W120155I
Elcometer P120/2	Elcometer P120 Rebar Locator - Imperial	W120155J
Accessories	Probe Lead for Elcometer P120	TW999165G
	100mm (4") Directional Search Coil for Elcometer P120	TW999198F
	150mm (6") Extra-Depth Directional Search Coil for Elcometer P120	TW999198E
	Borehole Probe for identification of rebar up to 405mm (15.9")	See page 184

Elcometer P350 & P351 Covermeters

The Elcometer P350 (Metric) and Elcometer P351 (Imperial) Concrete Covermeters have been designed in close co-operation with the construction industry to locate rebars in concrete quickly and to accurately measure concrete cover.

Measuring concrete cover thickness with high accuracy the Elcometer P350 and Elcometer P351 are used throughout the world by Repair Specialists, Structural and Civil Engineers, Consultants and Surveyors as well as Pre-Cast Concrete and Pipe Manufacturers.

- *Precisely locate reinforcement bars in concrete* – One of the only Covermeters that can resolve bars at 150mm (6″) pitch at concrete cover deeper than 100mm (4″).

- *Accurately measure concrete cover thickness.*

- *Work close to adjacent metal objects without interference.*

- *Locate and measure welded mesh fabrications.*

- *Easy to use and always accurate* - Just three basic control buttons. The covermeter can be mastered in minutes and gives accurate results in all conditions.

- *Accurate concrete cover measurement and bar size estimation* - Measures concrete cover to bars of unknown size. A simple method gives accurate cover readings and an estimation of bar size.

- *Single handed operation* - The natural viewing angle and shoulder case make it easy to use the Elcometer P350 and Elcometer P351 Covermeters in the most extreme conditions.

- *Built to last* - Designed to give years of trouble free use.

- *The 'Professionals' Covermeter* - A very precise search field for exact location of the reinforcement bars makes the Elcometer P350 and Elcometer P351 Covermeters one of the most usable non-destructive concrete testers on the market.

- *Maximum depth of cover and resolution* - The precise, highly directional field of the Elcometer P350 and Elcometer P351 means it remains accurate even at great depths.

- *Precise, rapid and easy location of bar direction* - Simply rotate the detection probe to quickly and precisely find the direction of the reinforcement bar.

- *Identify subsequent layers of rebars and tendon ducts* – Connected to our Borehole Probe (see page 184) the Elcometer P350 and Elcometer P351 is able to detect rebars or tendon ducts behind layer after layer of rebar up to 405mm (15.9″) deep.

Can be used in accordance with:	
BS1881	BS1881:204

KEY FEATURES

- Expandable with a range of optional extras. The Elcometer P350 and P351 Covermeters can meet many specialist needs.

- Accuracy of measurement between 6 and 30mm ($1/4$ and 1.2") is ±1mm (±0.04") - Twice that required by BS1881:204.

- Ideal for checking pre-cast concrete and reinforced cages in concrete pipes.

- Exceptionally congested situations and areas close to corners can be investigated.

- Castellated concrete surfaces can be surveyed as the optional Midget Head fits between sculpted reliefs.

- Precise measurement of areas with very low cover and excellent accuracy with bars at close centres.

- With the optional Large Probe Head, the Elcometer P350 and P351 can measure cover to 200mm (8").
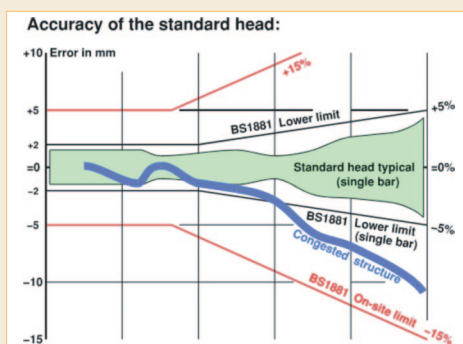
Elcometer P350 and Elcometer P351 Covermeters accuracy with Standard Head
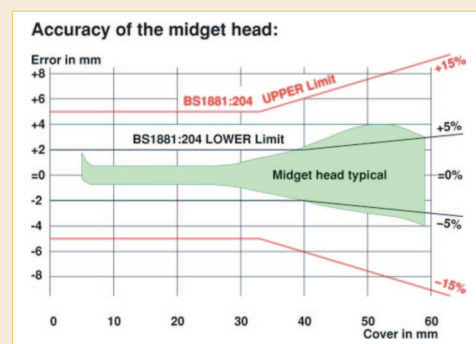
Elcometer P350 and Elcometer P351 Covermeters accuracy with optional Midget Head

	Elcometer P350 (Metric)	Elcometer P351 (Imperial)
Dimensions - Unit with Standard Head and Lead	220 x 150 x 175mm	10 x 10.2 x 5.32"
Shipping Weight	5.1kg	180oz
Display	4-digit LCD cover in mm (or signal mV).	4-digit LCD cover in inches (or signal mV).
Audible/Visual Signal	Built-In Loudspeaker and Analogue Meter	
Power Supply	NiCad rechargeable 8.4V with an external sealed charger unit.	
Recharge Time	14-16 hours	
Operating Hours	13 hours minimum.	

STANDARD SEARCH HEAD			
Cover Range	40mm (1.6") Diameter Bar	25-100mm	1 to 4"
	8mm (0.32") Diameter Bar	25-100mm	1 to 4"
Accuracy	Up to 65mm (2.56")	±2mm	±0.08"
	70mm (2.76") and over	±3mm	±0.12"
Resolution		16mm Diameter Bars at 50mm cover, 75mm pitch (60mm separation)	0.63" Diameter Bars at 2" cover, 2.95" pitch (2.36" separation)
Dimensions	Overall	155 x 88 face x 42mm	6.10 x 3.5 face x 1.65"
	Sensing Area	120 x 60mm	4.72 x 2.36"

MIDGET SEARCH HEAD		
Cover Range	6-50mm	0.25-2"
Accuracy	±1mm from 10 to 30mm	±0.04" from 0.4 to 1.18"
Resolution	10mm Diameter Bars at 15mm cover, 30mm pitch (20mm separation)	0.4" Diameter Bars at 0.6" cover, 1.18" pitch (0.8" separation)
Dimensions	Overall	85 x 52 face x 45mm	3.5 x 2.0 face x 1.77"
	Sensing Area	60 x 30mm	2.36 x 1.18"

LARGE HEAD - OPTIONAL			
Cover Range	40mm (1.6") Diameter Bar	200mm	7.9"
	8mm (0.32") Diameter Bar	20mm	0.79"
	Bar Diameters encompassed	5-40mm Diameter (11 values)	0.2-1.6" Diameter (11 values)
Bar-Sizing	Cover to bars of unknown size	±5%, manual operation	
	Measurement of Diameter	Manual estimate process	

Each Gauge is supplied in an ABS Plastic Carrying case together with a Standard and Midget Search Head, recharging unit, protective leather case, test certificate and operating instructions.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer P350	Elcometer P350 Concrete Covermeter – Metric	W350178E9HI	W350178H	W350178ECDN
Elcometer P351	Elcometer P351 Concrete Covermeter – Imperial	-	-	W351174I
Accessories	Mains Charger	TW999060C	TW999060F	TW999060G
	Large Search Head for the Elcometer P350 and Elcometer P351	TW999173H		
	Standard Search Head for the Elcometer P350	TW350175H		
	Standard Search Head for the Elcometer P351	TW351177H		
	Midget Search Head for the Elcometer P350 and Elcometer P351	TW999179H		
	Borehole Probe for identifying of rebar up to 405mm/15.9"	See page 184		

Elcometer P330 Concrete Covermeters

Elcometer P330 Concrete Covermeters are one of the finest non-destructive covermeters on the market today.

Using over 25 years of industry-leading pulse induction experience, our technological lead in designing covermeters combined with valuable feedback from our customers have all gone into the development of the Elcometer P330 Concrete Covermeter.

- Precisely locate and identify the orientation of reinforcement bars.
- Accurately measure concrete cover thickness up to 200mm (7.87")*.
- Low 'concrete cover' warning - programmable for a specified depth.
- Automatic rebar size estimation - the Elcometer P330 tells the bar diameter.
- Work close to adjacent metal objects without interference.
- Locates and measures welded mesh fabric.
- Optional probe extension allows rapid scanning of overhead or floor areas without ladders or sore knees!
- Menu driven display and prompts - available in English, French, German, Spanish and Italian.
- Switch between Metric/Imperial measurements.
- Fast and convenient covermeter operation - even in the dark - The ultra bright indicator light in the search head and loud audio tones make rebar location quick and accurate. The display also has a backlight as standard.
- Fully automatic rebar sizing and direct rebar measurement.

    Mode 1 'Cover Measurement' - The sensors in the covermeter probe measure the cover and estimate rebar diameter.

    Mode 2 'Orthogonal sizing' (patented) - The covermeter accurately measures the diameter of a single reinforcement bar.

- 'Low Cover' warning mode - A loud audio signal and bright light on the detection head give a clear warning of areas of low concrete cover (User programmable depth of cover).
- The advanced concrete covermeter that thinks for itself - Multiple sensors in the detection probe repeatedly scan the concrete, the internal microprocessor then builds up a '3D image' of the internal reinforcement. This advanced feature gives precise concrete cover measurement, even if you have selected the wrong rebar diameter.

Can be used in accordance with:	
ACI 318	BS1881:204
CP110	DIN1045
EC2	SIA 162

Requires optional large head and depends on size of rebar.
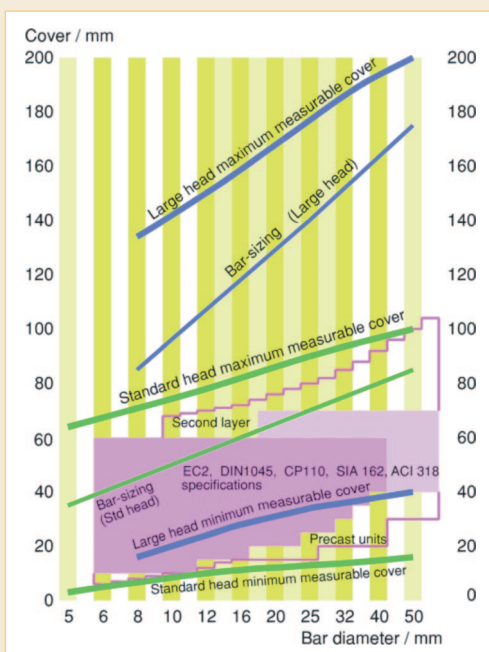
Elcometer P330's Accuracy
Standard and Large Detection Heads attached

Optional large head
Gives double the detection depth of the standard head.

The extension arm kit
This allows the operator simple access to areas normally requiring ladders or scaffolding. Reduces the need to kneel down and allows the user to scan bridge decks and floor areas from a standing position.
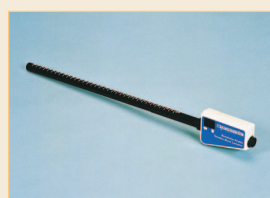
Borehole probe
Identify rebar and tendon ducts up to 405mm (15.9"). See Page 184 for further information.

	Elcometer P330 Covermeter	
Dimensions - Unit with Standard Head and Lead	247 x 127 x 174mm	9.72 x 5 x 6.85"
Shipping Weight (standard head)	4.76kg	10.5lb
Display	2 line x 24 CHR LCD Screen with backlight	
Audible / Visual Signal	Built-In Loudspeaker and Bright LED on Search Head	
Power Supply	NiCad rechargeable 8.4V with an external sealed charger unit.	
Recharge Time	14-16 hours	
Operating Hours	8-12 hours (6-9 hours if backlight switched on)	

STANDARD SEARCH HEAD			
Cover Range	40mm (1.6") Diameter Bar	15-95mm	0.6-3.75"
	8mm (0.32") Diameter Bar	5-70mm	0.2-2.75"
Accuracy	Up to 65mm (2.56")	±1-2mm	±0.04-0.08"
	70mm (2.76") and Over	±3-5%	
Resolution		10mm Diameter Bars at 30mm cover, 50mm pitch (40mm separation)	0.4" Diameter Bars at 1.2" cover, 2.0" pitch (1.57" separation)
Dimensions	Overall	140 x 63 face x 37mm	6.10 x 3.5 face x 1.65"
	Sensing Area	80 x 40mm	4.72 x 2.36"²

LARGE HEAD - Optional			
Cover Range	40mm (1.6") Diameter Bar	180mm	7.0"
	8mm (0.32") Diameter Bar	20mm	0.79"
	Bar Diameters encompassed	5-50mm Diameter (21 values)	0.2-1.96" Diameter (21 values)
Bar-Sizing	Cover to bars of unknown size	Automatic and Instantaneous	
	Measurement of Diameter	±15% Diameter, automatic operation	
Dimensions	Overall	210 x 100 face x 52mm	8.25 x 3.94 x 2.0"
	Sensing Area	160 x 80mm	6.30 x 0.10"

Model	Description	Part Number
Elcometer P330	Elcometer P330 (English/French) with Standard Head	W33015UF
Elcometer P330	Elcometer P330 (English/Spanish) with Standard Head	W33015UE
Elcometer P330	Elcometer P330 (German/English) with Standard Head	W33015DU
Elcometer P330	Elcometer P330 (French/English) with Standard Head	W33015FU
Elcometer P330	Elcometer P330 (Italian/English) with Standard Head	W33015AU
Elcometer P330	Elcometer P330 (Spanish/English) with Standard Head	W33015EU

Each Gauge is supplied in an ABS Plastic Carrying case together with a Standard Search Head, test certificate and operating instructions.
WHEN ORDERING PLEASE SELECT THE CORRECT CHARGER UNIT from the list below.

Accessories	Elcometer P330 Recharging Unit (UK, 240V)	TW999060C
	Elcometer P330 Recharging Unit (EUR, 220V)	TW999060F
	Elcometer P330 Recharging Unit (US, 110V)	TW999060G
	Large Search Head for the Elcometer P330 Covermeter	TW330161H
	Standard Search Head for the Elcometer P330 Covermeter	TW330154G
	Search Head Lead for the Elcometer P330 Covermeter - curly	TW330154F
	Search Head Lead for the Elcometer P330 Covermeter - straight	TW330154J
	Probe Head Extension Arm Kit	TW330154X
	Borehole Probe for identifying of rebar up to 405mm (15.9")	See page 184

Elcometer Borehole Probe/Tendon Duct Locator

The range of Protovale by Elcometer Concrete Covermeters and Rebar Locators are unequalled at finding the precise location and orientation of the first layers of reinforcing bars (rebars) with the transverse bar tied to it. In addition, Elcometer's Covermeters are the ideal instruments to measure depth of steel reinforcement in concrete.

No covermeter will find a second or subsequent layer of steel reinforcement in concrete. Nor can they locate pre-stressing or post tensioning tendons deep inside the concrete beneath the top reinforcement.

When connected to the Elcometer P330, P350 or P351 Covermeters or the Elcometer P120 Rebar Plus Locator, the Elcometer Borehole Probe becomes the only gauge in the world that is designed specifically for finding steel reinforcement in concrete below the top layer of rebar. It can quickly and reliably locate steel reinforcement in concrete such as rebars or tendon ducts, even if hidden behind layer after layer of rebar.
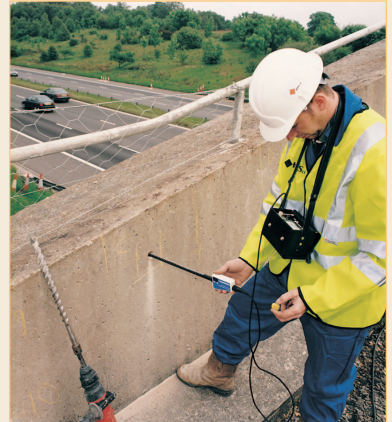
- *Reduce unnecessary boreholes* - Significantly reduces abortive drilling that costs both time and money.
- *Protect drills and reinforcement* - The probe warns you before you hit metal, reducing damage to drills, tendons and rebars.
- *Drill holes faster and safely* - Drill with confidence knowing that you are safe from hitting metal in the concrete over a measured distance.
- *Install anodes accurately* - Use the probe to install anodes at the correct distance from steel reinforcement.
- *Rugged enough for the toughest sites* - Sturdy construction and fibreglass shaft.
- *Directional location field* - Rocker switch on probe head allows fast, easy change between forwards or sideways detection.
- *Measures depth of hole* - The probe shaft is calibrated to measure depth drilled.
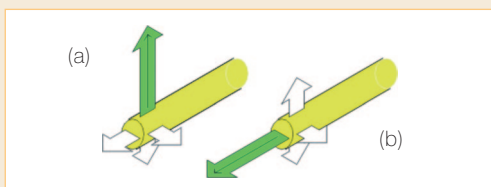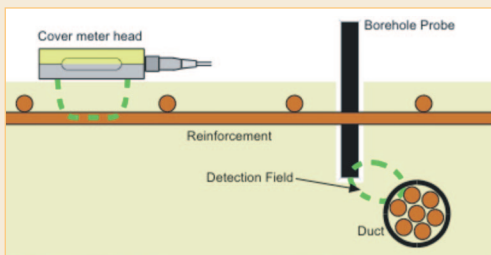
The 'easy' solution for finding tendon ducts and 'hidden' layers of rebar using a simple and reliable detection method.

1. Using a rebar locator or concrete covermeter, first identify a clear area between rebars to safely drill a hole larger than the Elcometer Borehole Probe's shaft.
2. The probe is then inserted to find information about 'hidden' reinforcement.
3. By increasing the depth of the borehole and re-inserting the probe, the User can quickly find steel rebars or tendon ducts deep inside concrete.

Accurate and reliable method - using the directional sensing probe technology.

By rotating the probe and selecting forwards or sideways sensing reinforcement lying below the first layer of rebar can be quickly located.

APPROXIMATE DETECTION RANGES TO THE SIDE AND IN FRONT OF THE BOREHOLE PROBE				
Steel Object and Diameter	Probe Orientation (see diagram above)	Elcometer P120	Elcometer P350 & P351	Elcometer P330
Tendon Duct 70mm (2.75") Diameter	to the side of the probe (a)	80mm (3.15")	45mm (1.77")	60mm (2.36")
	in front of the probe (b)	110mm (4.33")	60mm (2.36")	90mm (3.54")
Reinforcement Bar 20mm (0.78") Diameter	to the side of the probe (a)	55mm (2.16")	30mm (1.18")	45mm (1.77")
	in front of the probe (b)	75mm (2.95")	40mm (1.57")	60mm (2.36")

Overall Length	515mm	Shaft Diameter	16mm
Reach	405mm	Optimum Hole Diameter	20mm
Shaft Marking†	340mm	Weight	130g

Model	Description		Part Number
Borehole Probe	Elcometer Borehole Probe		TW999165F
Accessories	Probe Lead for connecting the Elcometer P120 to the Borehole Probe*		TW999165G

* The Elcometer Borehole Probe can be fitted directly to the Elcometer P330, P350 and P351 Covermeters. When connecting to the Elcometer P120 Rebar Plus Rebar Locator please order the probe lead accessory.

† Other lengths available upon request – please contact Elcometer for further information.

Wall Tie & Stud Locators

Any contractor engaged in maintenance work will be familiar with the problem of accurately locating the exact position of wall ties and studs in partitions.

There are many low cost metal detectors on the market today but, when detecting wall ties and studs, the instrument needs to be fast, stable, reliable and extremely tough.

Elcometer P130 Wall Tie & Stud Locator

The Elcometer P130 will rapidly and precisely locate mild steel or stainless steel wall-ties and is an excellent stud locator/stud detector, it is therefore an extremely versatile instrument.

This small, battery operated gauge has:

- High-impact ABS control unit in a tough leather case.
- Search coils encapsulated in epoxy resin for unmatched ruggedness.
- Built-in loudspeaker for clear audio signal; Standard 3.5mm stereo jack socket for headphones if required.
- Single control button for on/off and sensitivity/backoff control.

Key features

- *Fast and accurate* - The strongest signal is in the middle of the search head making it easy to pin point the wall ties. A clear audio tone helps to identify the quick and precise location without the need to keep looking at the meter.
- *No need to re-zero* - The Elcometer P130 is very stable in all weather conditions.
- *Designed with the needs of the operator in mind* - Easy to use, built to last, supplied with leather case and shoulder strap.
- *Single handed operation* - For safety and convenience when working on scaffold or ladders.

Model	Detects	Packing List
Elcometer P130/D	Mild Steel	Complete with 100mm (4") Locator Search Coil, Leather Case and Plastic Carry Case
Elcometer P130/E	Mild Steel and Stainless Steel	Complete with 100mm (4") Locator Search Coil, 150mm (6") Stainless Steel Search Coil, Leather Case and Plastic Carrying Case

Model	Description	Part Number
Elcometer P130/D	Elcometer P130/D Wall-Tie Locator - Mild-Steel	W130157B9D
Elcometer P130/E	Elcometer P130/E Wall-Tie Locator - Mild and Stainless Steel	W130157C9E
Accessories	100mm (4") Locator Search Coil	TW999198D
	100mm (4") Directional Search Coil - for Elcometer P130/D only	TW999198F
	150mm (6") Stainless Steel Search Coil - for Elcometer P130E only	TW999198E

Elcometer P150 Rebar & Wall Tie Locator

This fast, rugged gauge is supplied with two detector heads. A standard mild steel 100mm (4") head and an additional 150mm (6") detector head allows the gauge to locate phosphor-bronze, copper and some types of stainless steel* wall tie.

The Elcometer P150 can also detect mild and stainless steel rebars, bed joint reinforcement and hoop iron.

Furthermore the Elcometer P150 can locate wiring in plaster walls and is also an excellent stud locator/stud detector which makes it an extremely versatile instrument.

- High-impact ABS control unit in a tough leather case.
- Search coils are encapsulated in epoxy resin for unmatched ruggedness.
- Unit is switchable to detect or ignore stainless steel.
- Single control button for on/off and sensitivity/backoff control.
- Built-in loudspeaker for clear audio signals; Standard 3.5mm stereo jack socket for headphones if required.
- Operates from four standard AA-size batteries.
- Fast and accurate - The strongest signal is in the middle of the search head which makes it easy to pin-point the wall ties. A clear audio tone assists in the quick and precise location without the need to keep looking at the meter.

Key Features:

- No need to re-zero - The Elcometer 150 is very stable in all weather conditions.
- Designed with the needs of the operator in mind - Easy to use, built to last, supplied with leather case and shoulder strap.
- Single handed operation - For safety and convenience when working on scaffold or ladders.
- Dual-purpose Kits are available - For locating phosphor-bronze and some types of stainless steel wall ties, rebars and bed joint reinforcement.

APPROXIMATE DETECTION RANGES	
Mild Steel/Galvanised Fishtail Wall Ties (100mm/4" Search Head)	130mm (5.11")
Mild Steel/Galvanised Butterfly Wall Ties (100mm/4" Search Head)	130mm (5.11")
Stainless Steel Fishtail Wall Ties (with 150mm/6" Search Head)	80mm (3.15")

Model	Detects	Packing List
Elcometer P150/D	Mild Steel	Complete with 100mm (4") Locator Search Coil, 100mm (4") Directional Search Coil, Leather Case and Plastic Carrying Case
Elcometer P150/E	Mild Steel and Stainless Steel	Complete with 100mm (4") Locator Search Coil, 100mm (4") Directional Search Coil, 150mm (6") Stainless Steel Search Coil, Leather Case and Plastic Carrying Case

Model	Description	Part Number
Elcometer P150/D	Elcometer P150 Rebar Locator and Mild-Steel Wall-Tie Locator	W150157D9E
Elcometer P150/E	Elcometer P150 Rebar Locator, Mild-Steel and Stainless-steel Wall-Tie Locator	W150157E9E
Accessories	100mm (4") Locator Search Coil for Elcometer P150	TW999198D
	100mm (4") Directional Search Coil for Elcometer P150	TW999198F
	150mm (6") Search Coil for Stainless Steel Wall-Ties	TW999198E

Stainless steel does not give a strong signal. Please either send a drawing or ideally a sample of the stainless steel wall tie you need to locate so we can advise or test as necessary.

Industrial Metal Detectors

Whether you are on a construction site or at the side of the road, detecting metal piping, valve boxes and manhole covers can be difficult as plans are often incorrectly drawn up or the target is hidden by debris, foliage, etc.

Timber merchants, reclamation yards and logging companies have one thing in common – their need to detect and precisely locate metal objects in the wood, before it is sent to the sawmill.

Elcometer's range of industrial metal detectors have been specifically designed to meet the individual industrial requirements and will greatly reduce waste, downtime, increase your productivity and avoid catastrophes.

Elcometer P500 Imp Box Locator

Although originally designed to accurately locate valve boxes and manhole covers, the Elcometer P500 can also be used as a general purpose metal detector. The Elcometer P500 is both deceptively simple to use and very rugged making it a favourite choice in the market.

Detecting metal objects down to a maximum of 1m (3.2'), the Elcometer P500 has a number of key features over other industrial metal detectors. These include:

- A strong focused search field ensures the accurate location of objects close to metal fencing and vehicles.
- Ignores any ghost signals from cigarette packets, drink cans and other metallic waste materials – often picked up by other detectors on the market.
- Manufactured from a single moulded design in high impact ABS plastic, the Elcometer P500 stands up to the tough environment.
- Balanced, lightweight unit with a single control button for ease of use.
- Audio signal with headphone socket and an ultra-bright LED visual indicator identify when metal has been detected.

DIMENSIONS		
	Metric	Imperial
Overall Length	96cm	38"
Search Head Diameter	21cm	8"
Weight	1.1kg	2.5lb
Power Supply	4 x 1.5V AA cells (Alkaline) or 4 x 1.5V NiMH rechargeable cells	

APPROXIMATE DETECTION RANGES		
Typical Object Type	Metric	Imperial
Stop Tap Box	50cm	19"
Fire Hydrant Cover	87cm	34"
Inspection Cover	95cm	37"

Model	Description	Part Number
Elcometer P500	Elcometer P500 Imp Box Locator	W500157F

Elcometer P520 Deep Cover Metal Detector

The Elcometer P520 Metal Detector is very high powered for greater depth detection. Originally designed to locate water mains, pipes and cables, the Elcometer P520 is also the perfect choice for location work in cluttered areas and at depths where other metal detectors simply do not work.

- *Deep-seeking and accurate* - Can locate a 100mm (4″) metal water main at 1.20m (46″) and will locate valves even when the frame and cover are missing.

- *Unaffected by temperature changes or power lines* - The Elcometer P520 is unaffected by changes in temperature and moisture, and overhead power lines (where normal tracing can not be used).

- *Stable and reliable* - The Elcometer P520 does not need constant zeroing or recalibrating and is built to last.

- *Clear audio signal* - Loudspeaker with a clear audio tone. In noisy environments simply connect headphones to the socket point.

- *Internal battery* - no need to find replacement batteries.

DIMENSIONS		
	Metric	Imperial
Main Unit	2.33 x 1.80 x 1.0cm	0.9 x 0.7 x 0.4"
Search Head Diameter	22cm	8.7"
Weight	850g	1.87lb
Power Supply	Internal rechargeable battery (supplied with charger unit)	

APPROXIMATE DETECTION RANGES		
Typical Object Type	Metric	Imperial
Cast Iron Main - 80mm (3")	100cm	39"
Cast Iron Main - 100mm (4")	118cm	46"
Valve Only - 100mm (4")	83cm	33"
Cast Iron Main - 150mm (6")	127cm	50"
Washout/Fire Hydrant Cover	121cm	47"
Plate - 140mm (5^1/$_2$") Diameter	70cm	27"

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer P520	Elcometer P520 Metal Detector with charger unit	W520162H	W520162I	W520162J
Accessories	Replacement Mains Charger	TW999060C	TW999060F	TW999060G
	Replacement 200mm (8") Search Coil for the Elcometer P520		TW520197B	

Elcometer P600 Timber Metal Detector

The Elcometer P600 is a small versatile instrument which will accept different search coils for a wide variety of applications. It is a very cost effective instrument for finding nails in timber and works equally well on all types of hard and soft wood.

Designed for the Timber Reclamation Industry, the Elcometer P600 will detect and locate nails, small pieces of metal (including shrapnel) in timber of all types.

If used to find metal in wood before machining, damage to expensive equipment is prevented, saving the cost of replacing saws and loss of income due to 'downtime'.

- Fast and accurate - Pinpoints the exact location of metal in the timber with a clear audio signal and analogue meter.
- Stable and reliable - Unaffected by moisture, temperature changes and nearby electrical signals.
- Versatile - Interchangeable heads for multiple applications and requirements. Detecting metal in wooden objects such as reclaimed timber and scaffold planks is easily accomplished.

Also available in a Veterinary Version – for detecting metal in farm animals (cows, sheep, etc). Please contact Elcometer for further information.

DIMENSIONS		
	Metric	Imperial
Main Unit	183 x 110 x 78mm	7.2 x 4.3 x 3"
100mm (4") Search Coil Diameter	108mm face	4.25" face
150mm (6") Search Coil Diameter	145mm face	5.70" face
150mm (6") Search Coil Diameter (for Stainless Steel)	145mm face	5.70" face
200mm (8") Search Coil Diameter	217mm face	8.50" face
Weight	850g	1.87lb
Power Supply	4 x AA1.5V cells (Alkaline) or 4 x 1.5V NiMH rechargeable cells	

APPROXIMATE DETECTION RANGES			
Typical Object Type		Metric	Imperial
Staple – length 38mm (1.5")	100mm (4") Search Coil	130mm	5.0"
	200mm (8") Search Coil	200mm	7.9"
Nail – length 25mm (3.0")	100mm (4") Search Coil	90mm	35.5"
	200mm (8") Search Coil	140mm	5.5"
Nail – length 125mm (5.0")	100mm (4") Search Coil	130mm	5.0"
	200mm (8") Search Coil	200mm	7.9"

Model	Description	Part Number
Elcometer P600/B	Elcometer P600 Timber Metal Detector with 100mm (4") Search Coil	W600157B
Elcometer P600/J	Elcometer P600 Timber Metal Detector with 150mm (6") Stainless Search Coil	W600157J
Elcometer P600/H	Elcometer P600 Timber Metal Detector with 200mm (8") Search Coil - Short-Handled	W600157H
Elcometer P600/I	Elcometer P600 Timber Metal Detector with 200mm (8") Search Coil - Long-Handled	W600157I
Accessories	Spare 100mm (4") Search Coil	TW999198D
	Spare 150mm (6") Stainless Search Coil (Elcometer P600/J only)	TW999198E
	Spare 200mm (8") Search Coil - Long-Handled	TW999198G
	Spare 200mm (8") Search Coil - Short-Handled	TW999198H
	Spare 150mm (6") Search Coil for Veterinary Model only	TW999198J

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Elcometer P610 Timber Metal Detector

The Elcometer P610 has been designed specifically to accurately locate ferrous metal objects - such as gate hooks, nails, staples and even shrapnel - in timber, logs and wood of all types.

Mill downtime, saw doctoring costs and missed delivery schedules all make hitting metal in timber a very costly mistake. Buying and transporting timber to a sawmill, only to have it rejected because of metal contamination, wastes both time and money. The answer to these costly problems is the Elcometer P610.

- Auto-Zero button for exact pinpointing of the metal objects.
- Analogue meter shows the signal strength – allowing you to identify the orientation of the metal object.
- Stable and reliable results – the Elcometer 610 searches equally well through wet and dry, hot or cold, hardwoods and softwoods.
- Loudspeaker volume control and socket for headphones (for noisy environments).

DIMENSIONS		
	Metric	Imperial
Main Unit	2.33 x 1.80 x 1.0cm	0.9 x 0.7 x 0.4"
Search Head Diameter	22cm	8.7"
Weight	850g	1.87lb
Power Supply	Internal rechargeable battery (supplied with charger unit)	

APPROXIMATE DETECTION RANGES		
Typical Object Type	Metric	Imperial
Gate Hook	61cm	24"
Barbed Wire – length 400mm (15.7")	36cm	14"
Staple – length 40mm (1.6")	33cm	13"
Nail – length 75mm (3.0")	33cm	13"
Nail – length 125mm (5.0")	34cm	13.4"

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer P610	Elcometer P610 Timber Metal Detector with Charger	W610170H	W610170I	W610170J
Accessories	Replacement 200mm (8") Search Coil		TW610197A	

Live Cable Locators

Whether you are on a construction site or at the side of the road, detecting buried power cables before excavating is essential, not only for health and safety but also for financial reasons. Accidentally cutting a live cable (which is under load) can cut off power to large areas of the population.

Elcometer P700 Live Cable Locator

The Elcometer P700 is a live cable detector, which gives an indication of cable depth. It can save you time and money by avoiding unnecessary excavation.

This lightweight and rugged live cable detector has one control knob for all functions and a clear analogue meter to help estimate cable depth.

- *Saves excavation time* - The Elcometer P700 live cable detector is used to find current-carrying cables, their direction and their depth, down to 5 metres (16').

- *Easy to use* - Designed without any unnecessary extras. One control does it all!

- *Clear audio signal* - A peak in the signal accurately locates the live cable so its orientation can be determined.

Note: The Live Cable Locator can only find electrical cables that have a current flowing through them. It will not locate a cable through which no power is being drawn.

Dimensions	960 x 100 x 75mm 37.7 x 3.9 x 2.9"
Frequency	50Hz and 60Hz (third harmonic)
Sensitivity	4mA/m 5nWb/m^2
Weight	1.27kg 2.8lb
Power Supply	1 x 9V PP3 cells (Alkaline)
Approximate Detection Range	Load carrying live cables down to 5m (16')

Model	Description	Part Number
Elcometer P700	Elcometer P700 Live Cable Locator	W700168G

Gauge Multiplexers

Industry is striving for increased levels of quality. The time spent controlling and monitoring this can be greatly speeded up by connecting every electronic gauge (scales, callipers, thickness gauges, profile gauges, etc.) which has a data output to a computer.

Many gauges, however cannot link to the back of the computer. Either they have the wrong connector, or there is no free connection point (port) on the PC.

Elcometer's range of multiplexers allows most gauges to link to the PC. They also allow a number of different gauges to share the same computer port and enable analogue gauges to be connected to the PC.

There are essentially three types of connector in use today:

Digimatic   Seen on Mitutoyo® manufactured gauges, these have 2 rows of 5 connectors. The signal must pass through a multiplexer or converter to allow them to connect to the computer.

RS232   The RS232 9 pin 'D' connector (2 rows, 1 x 5 pin and 1 x 4 pin) until recently was the standard method for connecting equipment to the computer.

USB   Standing for Uniform Serial Bus, this is appearing more and more in the marketplace. On many laptop computers it is the only port. Elcometer Multiplexers can be linked to this port using a RS232/USB connecting cable.

Elcometer's range of Multiplexers allow most gauges to link to the PC. They also allow a number of different gauges to share the same computer port and enable analogue gauges to be connected to the PC.

Dataputer 1CHM Multiplexer

This simple multiplexer is really a converter - converting the Mitutoyo® type Digimatic signal into RS232, thus allowing you to connect Digimatic equipment directly into a PC.

By installing the DATA-XL™ Software you can quickly link a gauge into Microsoft® Excel. Alternatively, connect your gauge into an SPC software program such as Dataputer Datastat allowing fast and accurate data entry for further analysis.

The Dataputer 1CHM Multiplexer does not need an external power supply, it is powered by the PC.
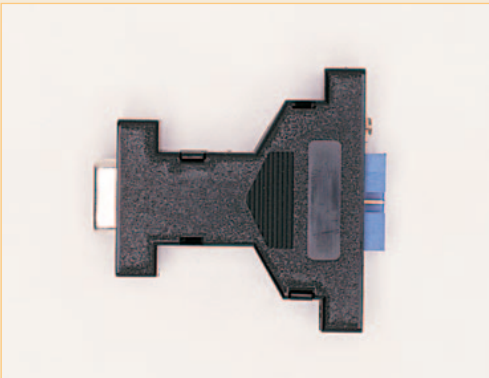
Dimensions	57 x 54 x 16mm (2.24 x 2.13 x 0.63")
Weight	22g (0.05lb)
Output Protocol	RS232 1200 Baud, 8 Data Bits, No Parity, 1 Stop Bit
Connectors	1 x Digimatic Input
PC Connection	RS232 socket to connect to PC
External Data Trigger	2.5mm jack socket for footswitch
Power Supply	Self-Powered by PC or Data Collector

Model	Description	Part Number
Dataputer 1CHM	Dataputer 1CHM Multiplexer	M001CHM
Accessories	DATA-XL™ Software (see page 197)	M500DXL
	RS232 - PC Lead	T99915777
	RS232 - USB Transfer Lead	T99916716
	Foot Switch	Q3007846-

DATAPUTER® by elcometer

Dataputer 4CHM Multiplexer

This 4 channel multiplexer allows you to connect up to 4 Digimatic (Mitutoyo® type) gauges into a single port on your PC.

By installing the DATA-XL™ Software you can quickly link 4 gauges into Microsoft® Excel. Alternatively, you can connect gauges into an SPC software program such as Dataputer Datastat - allowing fast and accurate data entry for further analysis.

The Dataputer 4CHM Multiplexer does not need an external power supply, it is powered by the PC.

For those times when an extra hand is needed to transmit the signal, the Dataputer 4CHM Multiplexer can be connected to a foot switch, allowing the data to be transmitted without accidentally changing the reading or worse, dropping the component!

Dimensions	82 x 63 x 35mm (3.23 x 2.48 x 1.38")
Weight	136g (0.3lb)
Output Protocol	RS232 1200 Baud, 8 Data Bits, No Parity, 1 Stop Bit
Connectors	4 x Digimatic Inputs
PC Connection	RS232 socket to connect to PC
External Data Trigger	2.5mm jack socket for footswitch
Power Supply	Self-Powered by PC or Data Collector

Model	Description	Part Number
Dataputer 4CHM	Dataputer 4CHM Multiplexer	M004CHM
Accessories	DATA-XL™ Software (see page 197)	M500DXL
	RS232 - PC Lead	T99915777
	RS232 - USB Transfer Lead	T99916716
	Foot Switch	Q3007846-

Dataputer 4CHU Universal Multiplexer

This 4 Channel Multiplexer allows the connection of up to 4 gauges into a single port on a PC. Mitutoyo® type Digimatic, RS232 serial or analogue gauges can all be used with the Dataputer 4CHU Multiplexer.

Although there are 8 connection points, the Dataputer 4CHU has 4 channels. Only one gauge can be connected to each of the Mitutoyo® type Digimatic/RS232 point pairs at a time.

By installing the DATA-XL™ Software (see page 197), you can quickly set up the serial gauges and link the 4 gauges directly into Microsoft® Excel. Alternatively, connect your gauges into an SPC software program such as Dataputer Datastat (see pages 198-201), allowing fast and accurate data entry for further analysis.

For those times when an extra hand is required to transmit the signal. The Dataputer 4CHU Multiplexer can be connected to a foot switch allowing the data to be transmitted without accidentally changing the reading or worse, dropping the component!
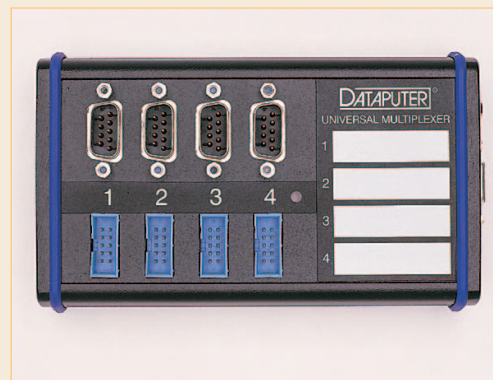
Dataputer 8CHM Multiplexer

This 8 Channel Multiplexer allows the connection of up to 8 Digimatic (Mitutoyo® type) gauges into a single port on a PC.

By installing the DATA-XL™ Software (see page 197), you can quickly link 8 gauges directly into Microsoft® Excel. Alternatively, connect your gauges into an SPC software program such as Dataputer Datastat SPC (see pages 198-201), allowing fast and accurate data entry for further analysis.

The Dataputer 8CHM Multiplexer can be connected to a foot switch allowing the data to be transmitted - without accidentally changing the reading.
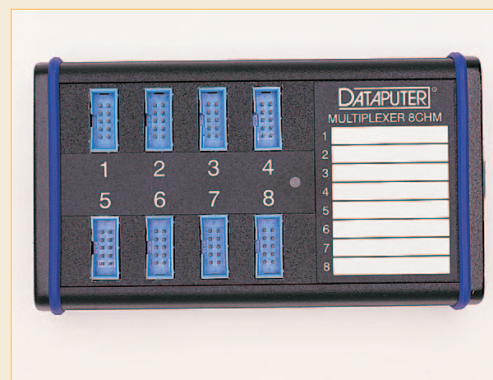
	4CHU UNIVERSAL	8CHM
Dimensions	145 x 82 x 35mm (5.71 x 3.23 x 1.38")	
Weight	282g (0.62lb)	241g (0.53lb)
Output Protocol	RS232 1200 Baud, 8 Data Bits, No Parity, 1 Stop Bit	
Connectors	4 x Digimatic Mitutoyo® Inputs 4 x RS232 9 Pin 'D' Inputs	8 x Digimatic Mitutoyo® Inputs
PC Connection	9 way 'D' type socket to connect to PC	
External Data Trigger	2.5mm jack socket for footswitch	
Power Supply	9V external power supply with 2.5mm coaxial socket, centre positive	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Dataputer 4CHU	Dataputer 4CHU Universal Multiplexer	M004CHU1	M004CHU2	M004CHU3
Dataputer 8CHM	Dataputer 8CHM Multiplexer	M008CHM1	M008CHM2	M008CHM3
Accessories	DATA-XL™ Software (see page 197)	M500DXL		
	RS232 PC Lead	T99915777		
	RS232 USB Transfer Lead	T99916716		
	Foot Switch	Q3007846-		

Gauge Multiplexers

Dataputer 8CHU Universal Multiplexer

This 8 channel multiplexer allows up to 8 gauges to be connected into a single port on a PC. Mitutoyo® type Digimatic, RS232 Serial or Analogue gauges can all be used with the Dataputer 8CHU Multiplexer.

Although there are 16 connection points, the Dataputer 8CHU has 8 channels. Only one gauge can be connected to each of the Mitutoyo® type Digimatic/RS232 point pairs at a time.

By installing the DATA-XL™ Software (see page 197), you can quickly set up the serial gauges and link the 8 gauges directly into Microsoft® Excel. Alternatively, connect your gauges into an SPC software program such as Dataputer Datastat (see pages 198-201), allowing fast and accurate data entry for further analysis.

The Dataputer 8CHU Multiplexer can be connected to a foot switch allowing the data to be transmitted without accidentally changing the reading.

Dataputer 16CHM Multiplexer

This 16 channel multiplexer allows up to 16 Digimatic (Mitutoyo® type) gauges to be connected into a single port on a PC.

By installing the DATA-XL™ Software (see page 197), quickly link up to 16 gauges into Microsoft® Excel. Alternatively, connect the gauges into an SPC software program such as Dataputer Datastat (see pages 198-201), allowing fast and accurate data entry for further analysis.

As with all the Dataputer CHM Multiplexer series, the 16CHM is capable of multiple gauge readings as it is sometimes desirable to obtain readings from all the connected gauges at once. This is typical when a component is placed into a measuring fixture.

The Dataputer 16CHM Multiplexer can be connected to a foot switch allowing the data to be transmitted without accidentally changing the reading.

	8CHU UNIVERSAL	16CHM
Dimensions	214 x 82 x 35mm (8.43 x 3.23 x 1.38")	
Weight	405g (0.89lb)	342g (0.75lb)
Output Protocol	RS232 1200 Baud, 8 Data Bits, No Parity, 1 Stop Bit	
Connectors	8 x Digimatic Mitutoyo® Inputs 8 x RS232 9 Pin 'D' Inputs	16 x Digimatic Mitutoyo® Inputs
PC Connection	9 way 'D' type socket to connect to PC	
External Data Trigger	2.5mm jack socket for footswitch	
Power Supply	9V external power supply with 2.5mm coaxial socket, centre positive	

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Dataputer 8CHU	Dataputer 8CHU Universal Multiplexer	M008CHU1	M008CHU2	M008CHU3
Dataputer 16CHM	Dataputer 16CHM Multiplexer	M016CHM1	M016CHM2	M016CHM3
Accessories	DATA-XL™ Software (see page 197)	M500DXL		
	RS232 PC Lead	T99915777		
	RS232 USB Transfer Lead	T99916716		
	Foot Switch	Q3007846-		

Multiplexer Software

There are two ways that data can be collected – Electronically, where there is no human intervention, and Manually, where data is collected by the User with the help of measurement instrumentation.

When collecting data manually, the readings are recorded on to paper or manually keyed into a computer. Either way errors can occur – misreading or miskeying in a number can be the difference between a pass and a fail.

Elcometer's multiplexer software creates a bridge between the Electronic and Manual methods - measurements taken by an operator are automatically inserted into the computer.

Dataputer DATA-XL™ Software

Data-XL™ is a simple to use software package which allows the input of real-time data collected from a variety of devices, including thickness gauges, balances, scales, barcode scanners, laboratory instruments, directly into Microsoft® Excel.

Data-XL™ can either be used with serial gauges as a stand alone product, or alternatively, serial, analogue and/or Mitutoyo® type gauges can be linked to a PC using a Dataputer Multiplexer. The readings from all these gauges can be inputted directly into an Excel Spreadsheet using Data-XL™ for further analysis and reporting.

- Perform real-time analysis of data.
- Import serial data from virtually any device directly into Excel.
- Easy to follow set-up wizard allowing simple set-up of serial or analogue gauge.
- Identify gauge ports when using the Dataputer Multiplexers.
- Data-XL™ is the only software package of its kind which enables the User to pre-select how readings are entered in the spreadsheet, either down columns, across rows or a combination of both.
- Remove unwanted information from the reading - units of measure, characters, etc.
- Once data has been inputted into Excel using Data-XL™, all the usual formatting and charting functions of Excel can be used to generate professional reports.
- Save time and money by eliminating time consuming manual data entry and associated errors.

Avoid hand writing and keying mistakes - do it accurately and automatically with Data-XL™.
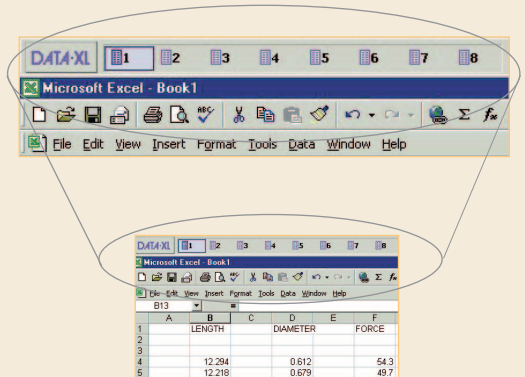
Model	Description	Part Number
Dataputer DXL	Dataputer DATA-XL™ Software	M500DXL

DATAPUTER® by elcometer®

Statistical Process Control (SPC) Software

In traditional manufacturing Production to make the product and the Quality Department inspect it. After-the-event inspection is expensive and wasteful because:

- The product has already been made
- Costly re-work is not always possible

It is much more cost effective to avoid waste by monitoring and analysing the process during manufacture. This is the basis of Statistical Process Control (SPC).

Controlling The Process

For a product to be made without scrap, it must be manufactured within specified limits. But factors can prevent this from happening:

- *Natural Variation:* inherent in the machining process and cannot be changed without using a different process or machine
- *Assignable Variation:* outside influences that are controllable: temperature, sharpness of the blade, speed of manufacturing, skill of machinist etc.

An Example of Variation - A machine cutting straws to length will give an error from straw-to-straw. This is because of the inherent tolerances of the machine - Natural Variation. This is less significant than someone who cuts the same straws to length, using a ruler - Assignable Variation.

This raises the question - Is the manufacturing process able to manufacture within specification?

Testing The Process Capability

Continuing our example, cut a number of straws to the required length (usually 50). Accurately measure the straw lengths. Plot the lengths on a graph to identify the variation.

Histogram and Capability charts can be used for this purpose. Once it has been determined that the process is capable, the process can be monitored over time.

Monitoring The Process Over Time

In an ideal world, every product that is being made would be measured. In the real world, there is not enough time or resource to do this so a sample group of product is measured on a regular basis. These groups are known as subgroups.

The subgroups of data are plotted on to a graph - in chronological order:
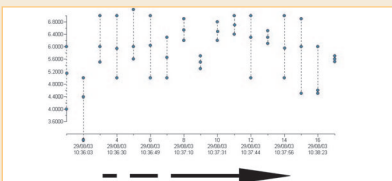
The average value of each subgroup is then used to generate the Process Control Chart - building up the actual manufacturing process over time, known as an Xbar Chart.

Setting Control Limits

In order to prevent scrap, a set of "early warning limits" known as Control Limits are established. These limits are set inside the upper and lower specification limits and warn the operator before scrap is produced.
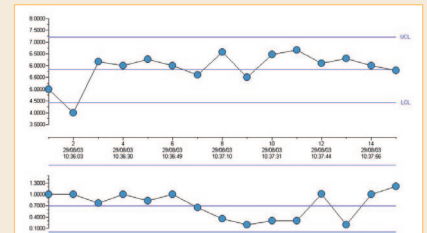
Datastat SPC Software

Dataputer's Datastat Computer Software Program provides the means to display the production process and highlights when the process violates control limits. Datastat can predict future violations and therefore improve the production process by:

- Identifying problem areas in manufacture.
- Helping to refine production methods and techniques.
- Identifying the root cause of product problems.

Improved production process leads to:

- Lower scrap and re-work levels resulting in lower direct costs as fewer components and materials are used.
- More efficient use of machinery and production time.
- Improving the quality of the product leading to greater customer satisfaction reflected in fewer complaints and returned goods.

Although Datastat has been designed with simplicity in mind, this has not been achieved at the expense of functionality. Datastat's wide range of features can be quickly set up using the Datastat Wizard.

Datastat has a comprehensive range of data entry options, charting capabilities, reporting functions and other helpful features, summarised below.
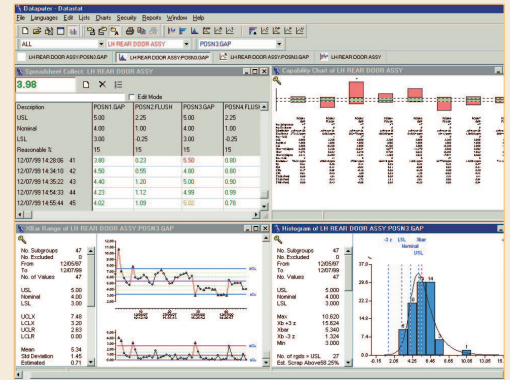
DATA COLLECTION	
Normal keyboard entry and/or direct input from RS232 instruments and multiplexers (see pages 193-196).	
Dataputer collectors either directly or through a Dataputer Network (see page 205).	
Datastat has 8 data tags to identify the data source and allow data to be filtered for analysis purposes, e.g. operator name, batch number, etc.	
DATA ANALYSIS	
Datastat incorporates capabilities studies and control charts, both variable and attribute.	
Variable and attribute control charts – including Xbar/Range, Xbar/Sigma and individual moving range charts – visually indicates the product's process performance over time - it even warns the operator when it is heading towards the specification limits, avoiding any scrap being manufactured.	
Capability studies – Normal and Non-Normal Distribution curves can be viewed to analyse the spread of readings.	
REPORTING FUNCTIONS	
Pre-defined layouts of each chart enabling reports to be generated at the click of a mouse.	
Print preview – see how the reports look before printing.	
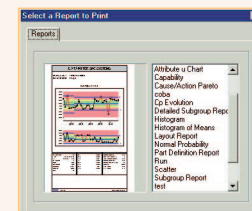
Model	Description	Part Number
Dataputer Datastat	Dataputer Datastat Software	Q29016858

Statistical Process Control (SPC) Software

Datastat CSV SPC Software

Using advanced programming techniques, Dataputer's Datastat CSV (Client Server Version) is a powerful SPC software program, which gives professional results in an easy-to-use package. Using Client/Server technology with open database connectivity (ODBC), Datastat CSV can be linked to existing data and also allows multiple Users to share a common database.

Datastat CSV is available in two versions, Administrator and Shopfloor.

Administrator   In this version all the set-ups are created for SPC studies including gauge configurations, tests for control, identification tags, user logins, security privileges, report designs and screen customisation.

Shopfloor   Provides the User with all the tools necessary to control the manufacturing process. Data collection can be by keyboard, direct gauge entry multiplexer, or by touch screen technology. Charts can be displayed alongside the readings and updated "live" as new data is collected. Warnings are given if violations occur and Cause/Actions and notes can be entered to record the problem and its solutions.

Common features include:

- Data and keyboard entry
- Direct input from gauges using RS232 port and multiplexers
- Transfer from Dataputer shopfloor collectors, directly or via a network
- Import from text files (filescan for automatic input from other applications or machines)
- 8 data tags to identify source of data and filter data for analysis
- Display of CAD drawings or pictures in .bmp, .wmf, or .jpg file formats so "hotspots" can be added to show which feature is to be measured next

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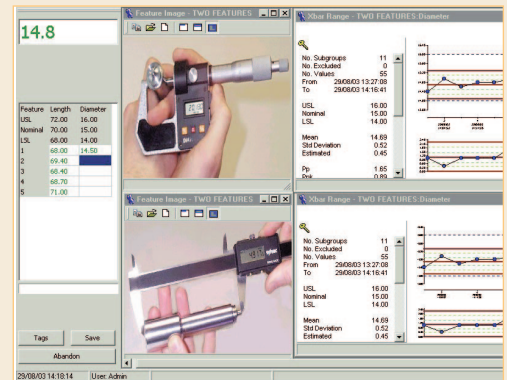
CONTROL CHARTS

Variable Charts
Xbar/Range, X/bar Sigma, Individual and Moving Range, Capability Indices, Warnings for out of control situations ("traffic light" sigma zoning), Cause and Actions, Run Chart, Scatter Chart to examine correlation between variables, Cp/Cpk Evolution of continuous improvement

Attributes Chart
p, np, c, u Defect Pareto

Cause/Action Pareto Charts
Identifies which is the most frequent reason for production faults and how you are correcting them

CAPABILITY STUDIES

Histogram of Individuals, Subgroup Means and Johnson (Non-Normal Distribution) Curve Charts
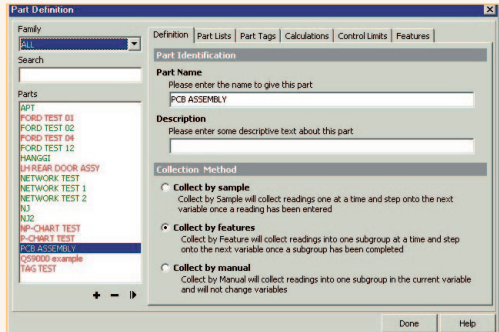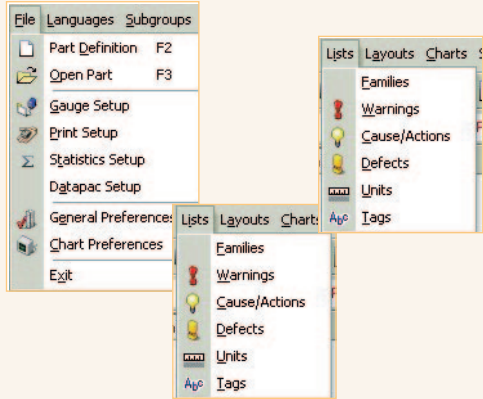
Distribution analysis – skewness, kurtosis, Chi-square curve fit test

Capability Statistics – Pp, Ppk, Cp, Cpk, CAM (CNOMO), etc

Multi-variable Capability Overview Chart
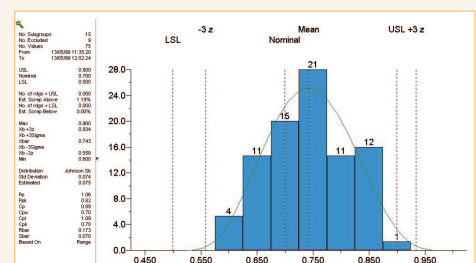
DATASTAT CSV ADMINISTRATOR ADDITIONAL FEATURES

SET-UPS

Part Definitions
Detailed information about the process such as tolerances, method of data capture, which violations are tested for etc, are entered.

Pre-defined lists
Known as Pick Lists, these can be created for Tag Entries, Warnings, Cause/Actions and Defects. These avoid the need to type in this information and hence reduce errors.

Calculation modes
User selected to determine when and how Control Limits etc, are calculated.

Gauge set-ups
Specify which gauges are used for each measurement and to configure the gauge for automatic data entry.

Choice of languages - English or French.

Warning List Customisation
Create your own warning lists, or use the standard lists in the software.

Chart Customisation
Set up individual configurations, colours, orientation, zoom, layout, etc.

Screen layouts
Set up your views to suit the way you want to work. These can be created and set up for each part and they appear automatically when the User logs on.

SECURITY

- Advanced security features that help Users achieve compliance to FDA's 21 CFR Part 11 regulations. These include:
- Encryption of passwords.
- Password expiry.
- Audit trail of data addition, deletion and edits.
- Restricted access based on user profiles.
- Log of all access and administrator warning of security breaches.

REPORTING

- All printed reports are fully customisable. If you don't like the reports supplied with the package these can be easily changed or new reports can be designed in minutes with our visual Report Designer.
- Reports can be output in PDF format for e-mail purposes.
- Screen layouts can be printed out with one mouse click.
- Print preview of any report – see exactly what will appear before printing.
- Batch Reports can be set up to print multiple reports unattended.

OTHER FEATURES INCLUDE

- Control Charts retain historical limits each time control limits are recalculated so that you can see how your process is performing.
- Fully networkable as standard – view at one station data being collected at any of the other stations. All charts are updated "live" at all stations, not just the one that is entering data.
- Customisable tool bars – short cut icons speed access to data and charts, only requiring a single mouse click.
- Works in conjunction with the full range of Dataputer Gauge Multiplexers for direct entry of measurements.
- Database Management – archives and stores data wherever it is needed. Stores data and records in separate folders.
- Complete folder and archive management.

Model	Description	Part Number
Dataputer CSV	Dataputer Datastat CSV Software – Administrator	Q29018583
Dataputer CSV	Dataputer Datastat CSV Software – Shopfloor	Q29018584

DATAPUTER® by elcometer®

Data Collectors

When collecting data in a laboratory, a computer is ideal. On the shop floor, where there is often oil and grease from machinery or airborne particulates from the production process, a computer is not suitable.

Elcometer's range of data collectors have been designed to work in this harsh environment. With sealed membrane technology and both battery and mains powered units available, our collectors are ideal for on-site inspection recording.

Dataputer 1000A & 1000V Data Collectors

The Dataputer 1000 range is available either as an Attributes or Variables portable data collector.

- *The Dataputer 1000A:* An ideal instrument for recording visual defects on products over time.
- *The Dataputer 1000V:* This Collector records all variable data information over time, including width, length, height, torque strength, etc.

The collectors and the software are fully networkable – see page 205 for further information.

Collectors can be used to record data at key areas of production. They can be either linked up to Datastat SPC Software directly or through a network, or process charts can be viewed on the data collector itself, allowing the operator to view the whole production cycle in real time at the touch of a button.
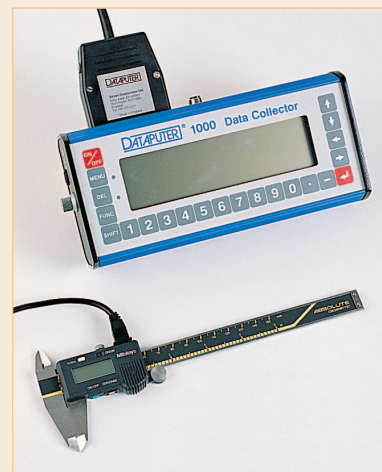
On screen charting – Sample graphs that can be displayed on the Dataputer 1000 Data Collector
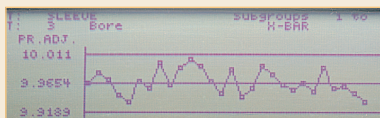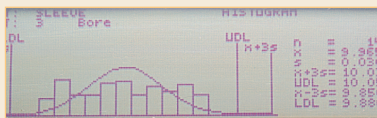
Control Chart   *Histogram Chart*   *Pareto Chart*

The Dataputer 1000 range incorporates two ports. One port dedicated for a barcode reader, ideal for collecting Attribute information. The second port has been designed for use with a wide range of electronic measuring devices using Dataputer designed interface cables, ideal for Variable data collection. (Contact Elcometer for further information).

The collectors can be programmed using the keyboard, or can be set up from data that has been created on the computer using Datastat SPC Software (see pages 198-201 for further information), giving total flexibility.

Real time process information can be seen on the shop floor at the data input stage allowing immediate corrective action to be carried out by the operator. The easy to read graphic display can be set to view a wide range of charts which include; Xbar, Range, Histograms, Pareto Charts and other Attribute information. The operator is now able to make informed decisions to improve manufacturing efficiency and quality with no additional work.

Available in English, French, German or Spanish.

Model	Description	Part Number	
		Attributes Only	Variables Only
Dataputer DP1000	Dataputer 1000 Data Collector - English	Q251100010	Q251100000
Dataputer DP1000	Dataputer 1000 Data Collector - French	Q251100011	Q251100001
Dataputer DP1000	Dataputer 1000 Data Collector - German	Q251100012	Q251100002
Dataputer DP1000	Dataputer 1000 Data Collector - Spanish	Q251100014	Q251100004

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Accessories	Mains Lead	Q9007796-	Q9007797-	Q9007798-
	Dataputer Networks	See Page 205 for further information		

Dataputer 3000VA & 3000VS Data Collectors

The Dataputer 3000 features include an alpha-numeric keyboard and four gauge inputs, (one dedicated to barcode reading) for improved accuracy for both Attribute and Variable data input. Available in 2 versions:

- *The Dataputer 3000VA:* A Variable and an Attribute instrument, capable of accepting digital and analogue gauge inputs - increasing the diversity of the measurement devices that can be used.

- *The Dataputer 3000VS:* A Variable Short Run Collector, designed to record variable information for customers who manufacture in small batch volumes.

Designed into the Dataputer range of collectors is an easy to use data collection method. Data can be added using the user-friendly keyboard or alternatively through the gauge ports from electronic measuring devices.

All Dataputer collectors have automatic warnings designed specifically to inform the operator when the process is about to go out of control. Corrective action taken at this point will help to reduce costly rework and scrap, increasing your product quality and profits.

On screen charting – Sample graphs that can be displayed on the Dataputer 3000 Data Collector
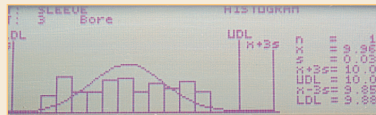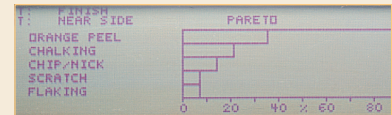
| Control Chart | Histogram Chart | Pareto Chart |

Real time process information can be seen on the shop floor at the data input stage allowing immediate corrective action to be carried out, by the operator. The easy to read graphic display can be set to view a wide range of charts which include; Xbar, Range, Histograms, Pareto Charts and other Attribute information. The User is now able to make informed decisions improving manufacturing efficiency and quality with no additional work.

Collectors can be used to record data at key areas of production and can be:

- linked up to the Datastat SPC Software directly or through a network, or
- the process charts can be viewed on the data collector itself.

This allows the operator to view the whole production cycle in real time at the touch of a button.

The collectors can be programmed using the keyboard or can be programmed from data that has been set up on the computer using Datastat SPC Software, giving you total flexibility.

Available in English, French, German or Spanish.

Model	Description	Part Number	
		3000VA	3000VS
Dataputer DP3000	Dataputer 3000 Data Collector - English	Q253100040-1	Q253100050-1
Dataputer DP3000	Dataputer 3000 Data Collector - French	Q253100041-2	Q253100051-2
Dataputer DP3000	Dataputer 3000 Data Collector - German	Q253100042-2	Q253100052-2
Dataputer DP3000	Dataputer 3000 Data Collector - Spanish	Q253100044-2	Q253100054-2

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Accessories	Mains Lead	Q9007796-	Q9007797-	Q9007798-
	RS232 - PC Lead	T99915777		
	Foot Switch	Q3007846-		
	Dataputer Networks	See Page 205 for further information		

DATAPUTER by elcometer

Dataputer 3000VGA Collection Station

The Dataputer 3000VGA Collection Station is a recently launched data collector from Dataputer.

Designed to operate in a similar way to the Dataputer 3000, the Dataputer 3000VGA provides the User with the ultimate collection station.

This Collector has been designed to record Variable and Attribute information over time.

- Ideal for variable measurement including width, length, height, torque strength, etc.
- Ideal for attribute measurement including, appearance, functionality testing and final packing checks

It is when you look at the back of the Dataputer 3000VGA that you see the real power of this Collection Station.

- 8 RS232 Gauge Ports
- 8 Digimatic Type Gauge Ports
- 1 25-pin 'D' port for all other gauge interfaces and external multiplexers
- 1 Printer Port
- 1 VGA Output port - to link to a PC Monitor for full screen display
- 1 Network Port - link up multiple stations to the PC
- 1 External Foot Switch to enter data whilst you hold the part

The Dataputer 3000VGA Collectors can be used to record data at key areas of production and can be:

- linked up to Datastat SPC Software directly or through a network, or
- the process charts can be viewed on the data collector itself, or
- the process charts can be viewed on the VGA Monitor

This allows the operator to view the whole production cycle in real time at the touch of a button.

The collector can be programmed using the keyboard or can be programmed from data that has been set up on the computer using Datastat SPC Software, giving total flexibility.

On screen charting – Sample graphs that can be displayed on the Dataputer 3000VGA
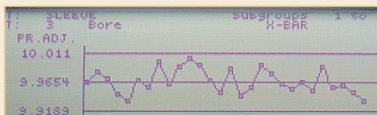
| Control Chart | Histogram Chart | Pareto Chart |
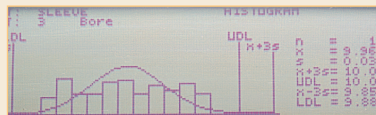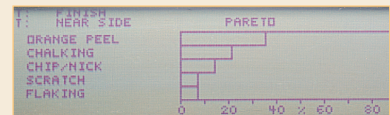
Real time process information can be seen on the shop floor at the data input stage allowing immediate corrective action to be carried out by the operator. The easy to read graphic display can be set to view a wide range of charts which include; Xbar, Range, Histograms, Pareto Charts and other Attribute information. The operator is now able to make informed decisions to improve manufacturing efficiency and quality with no additional work.

The Dataputer 3000VGA is available in English or French.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Dataputer DP3000VGA	Dataputer 3000VGA Collection Station	Q25116341-1	Q25116341-2	Q25116341-3
Accessories	RS232 - PC Lead	T99915777		
	Foot Switch	Q3007846-		
	Dataputer Networks	See Page 205 for further information		

Collector Networks

Due to the requirements of engineers needing up to date information at their fingertips, the Dataputer Collectors have the capability to be linked to a network. Connected directly to a computer, the collectors can either automatically or manually send data back to the Dataputer Software providing immediate information for online tracking of the production facility.

Connect gauges throughout the production process:

- *At Goods Inwards Inspection -* assess suppliers coating capability and quality.
- *On the Production Line -* continuous inspection can help to identify whether the production line is running correctly.
- *Across the Whole Factory -* have fixed inspection stations and roaming stations, data collectors can be connected to the network whenever required - updating the inspection reports automatically.

A single node Network
Ideal for additional analysis and data back up.
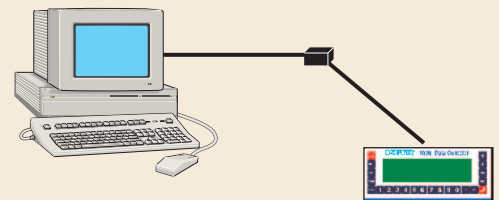
A multi-node Network
Allows the monitoring of data collected from data collectors throughout the factory at a single point.
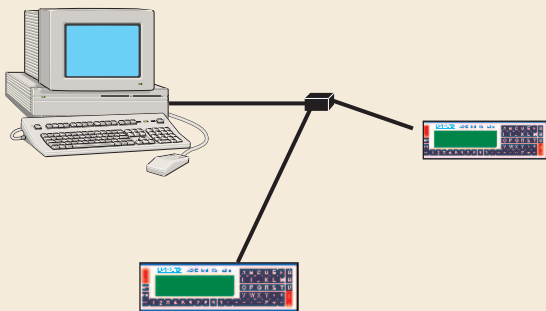
Combined Networks
Data can be collected away from the confines of a network, and connected at a free node for easy data transfer back to the computer as required.
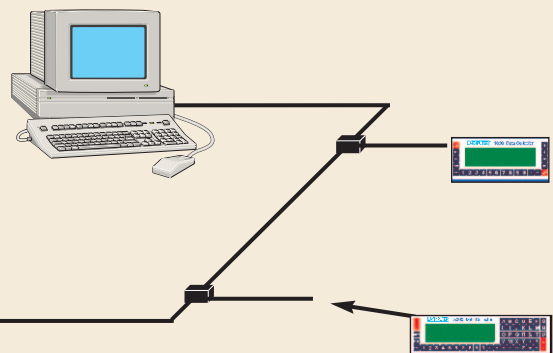
For further information on networking your collectors, please contact Elcometer.

Elcometer 365 Coating Thickness Gauge
see page 141
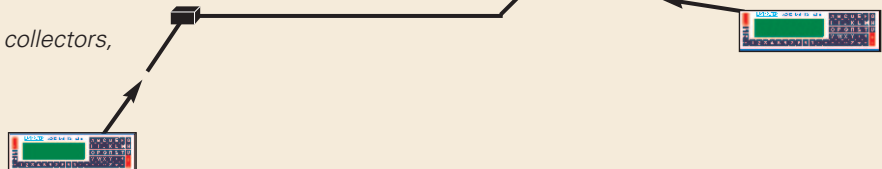
Fault Analysis

In the early 1900's, a principle was discovered by the Italian Economist, Vilfedo Pareto. This principle has more recently been expanded from its economic roots and is known as the "80:20 rule." This rule states that approximately 80% of the improvements (of a process) come from 20% of the corrections (to a process).

The question most often asked is what can be done first that will have the greatest improvement?

Elcometer's Fault Analysis software is designed to answer this question.

Dataputer DFA Fault Analysis Software

Dataputer Fault Analysis software has been designed to record and track all faults or defects. DFA graphically highlights problem areas helping to improve quality. Improving quality improves customer satisfaction.

Most companies monitor products during the manufacturing process collecting a considerable amount of data. In order to establish which fault or defect is causing the most problem, a chart can be drawn up.

With the use of Dataputer Fault Analysis Software, this single chart can be used to establish which particular area needs attention first - allowing the operator to target the most important area immediately, thus obtaining the greatest improvement.

As DFA is designed to fit into current collection procedures, all that has to be done is to store the data into the computer - either through the computer or through the Dataputer DFA Collector (see page 207) - and let DFA generate all the necessary reports.

Data Entry

The batch collection on DFA allows just that. With a simple traffic light sequence DFA helps to quickly identify potential problem areas as they occur and allows them to be corrected immediately.

All green, no problems. A yellow box indicates a potential problem. A red box indicates an area of continuous faults requiring immediate attention before delivery to the customer is affected.

Information is only as good as the data put in

That is why we at Dataputer have developed one of the most logical data entry screens available.

Click on the area where the fault has occurred and select the fault. DFA will do the rest.

Data can be collected using a barcode wand connected in between your computer keyboard and the computer. All barcodes are printed from within the DFA Software.
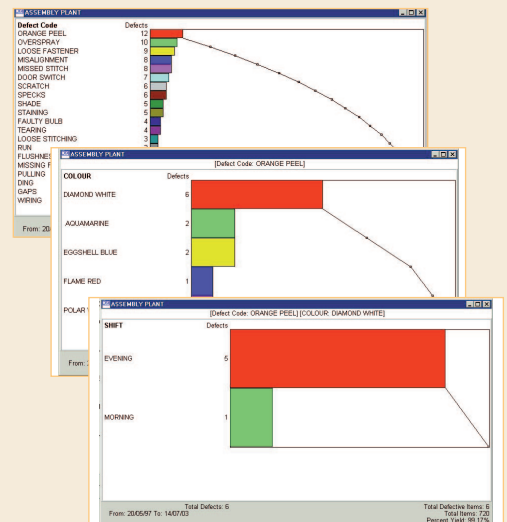
Each new process can have its own list of defect codes

Configure DFA as required. Create unique lists using the DFA Defect Code Screens.

Charting and Reporting

DFA doesn't stop with batch analysis - Dataputer have recognised the need to analyse trends in faults that have occurred, so the largest problem area can be targeted first and the improvements monitored.

The unique "drill down" feature allows the operator to explore the route cause of the problems right down to the particular area on the shop floor where the faults are occurring.

In fact, any bar on the Pareto Chart can be clicked and be analysed further via the DFA Drill Down Engine to establish the root cause.

User Selected Reporting - DFA's unique filter screens allows reports to be refined to only view what is required.

Reports can be printed out at the click of a button. By reducing preparation time and paper work professional reports can be used to help provide the highest level of service to your customers.
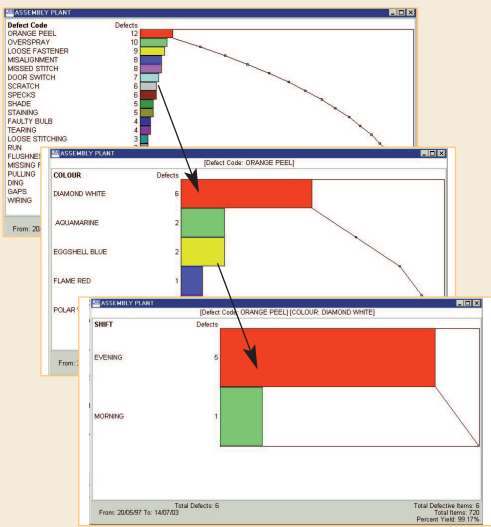
Model	Description	Part Number
Dataputer DFA	Dataputer Fault Analysis Software	Q29010030

Dataputer 1000DFA Data Collectors

Increasing the power of the DFA package, Dataputer have designed a portable data collector specifically for the DFA software.

Download your tag setups created in the DFA, to the full graphics display collector and it is ready to go. When the data gathering has been completed just upload the data back into the computer and let DFA do the rest.

The collectors don't even have to be restricted to one production facility. Link up collectors from different sites and watch production performance over the entire manufacturing infrastructure. The DFA Software prints its own barcodes; that is why each DFA Collector is supplied with a barcode wand for faster, more accurate data input.

Networking your Collectors

Using the Dataputer Network (see page 205) individual collectors can be linked to a central location where DFA Software can instantly identify the production process in real time.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Dataputer 1000DFA	Dataputer 1000DFA Data Collector with barcode wand	Q250100020-1	Q250100020-2	Q250100020-3
Accessories	Replacement Barcode Wand	Q41510076		
	Dataputer Networks	See Page 205 for further information		

DATAPUTER® by elcometer®

multiplexers and spc software

for our new catalogue
please contact the Dataputer Sales Team at Elcometer

Appendices

Appendix 1:
What is my Coating/Substrate Combination? Choosing the Right Coating Thickness Probe.

The list 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 Elcometer and arrange for our Technical Department to establish the most appropriate gauge for your process.

COATING	SUBSTRATE									
	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	-	-	-	-	-	-	-	-	-
Epoxy	NF	NF	NF	NF	F	-	NF	NF	-	NF
Galvanising	-	-	-	-	F	-	-	-	-	-
Lacquer	NF	NF	NF	NF	F	-	NF	-	-	NF
Metal Spray	-	-	-	-	F	-	-	-	-	-
Molybenum Disulphide	-	-	-	-	F	-	NF	-	-	-
Nickel (Electroless)	NF*	NF*	-	NF*	F*	-	-	-	-	-
Paint	NF	NF	NF	NF	F	NF	NF	NF	NF	NF
Plastic	NF	NF	NF	NF	F	NF	NF	NF	NF	NF
Plating	-	-	-	-	F	-	-	-	-	-
Rubber	NF	-	-	-	F	-	-	-	NF	-
Resist	-	-	-	NF	-	-	-	-	-	-
Tin	-	-	-	-	F	-	-	-	-	-
Varnish	NF	NF	NF	NF	F	-	-	-	-	-
Zinc	-	-	-	-	F	-	-	-	-	-

NF: use Non-Ferrous probe

 F: use Ferrous probe

 *: known samples required for calibration

Appendix 2: International Standard Reference Numbers

This non-exhaustive list of standards is provided for information purposes only. To check if our products complies to or can be used in accordance with a standard that is not listed below, please contact Elcometer.

Standard	Reference	Page
ACI		
318	Rebar Locators & Concrete Covermeters - Covermeters	180-184
503-1	Adhesion	153-163
503-2	Adhesion	153-163
503-3	Adhesion	153-163
503-4	Adhesion	153-163
503-R	Adhesion	153-163
AS		
1580-602.2	Appearance - Gloss	60-62
3894.1	Pinhole & Porosity	165-170
ASTM		
A 153	Coating Thickness	130-151
A 525	Coating Thickness - Galvanising	130-151
A 584	Appearance - Gloss	60-62
B 117	Corrosion	83-89
B 244	Coating Thickness	130-151
B 287	Corrosion - Salt Spray	84-86
B 368	Corrosion	83-89
B 499	Coating Thickness	130-151
B 648	Hardness - Barcol	52
B 659	Coating Thickness	130-151
C 217	Washability, Brushability & Abrasion Testers - Taber	44-46
C 241	Washability, Brushability & Abrasion Testers - Taber	44-46
C 321	Adhesion	153-163
C 346	Appearance - Shade	63
C 346	Appearance - Gloss	60-62
C 501	Washability, Brushability & Abrasion Testers - Taber	44-46
C 584	Appearance - Gloss	60-62
C 633	Adhesion	153-163
C 1353	Washability, Brushability & Abrasion Testers - Taber	44-46
D 332	Fineness of Grind - Grinder	1
D 344	Film Application & Test Charts - Test Charts	33-38
D 387	Fineness of Grind - Grinder	1
D 522	Adhesion - Cross Cut	153-155
D 522	Elasticity & Resistance Deformation - Conical Mandrel	55
D 523	Appearance - Gloss	60-62
D 562	Viscosity - Krebs	13
D 711	Drying Time - Traffic Paint	40
D 823	Film Application & Test Charts	23-38
D 823-B	Film Application & Test Charts	23-38
D 823-C	Film Application & Test Charts - Centrifugal	23
D 823-C	Film Application & Test Charts	23-38
D 856	Viscosity - Krebs	13
D 968	Washability, Brushability & Abrasion Testers - Falling Sand	46
D 1003	Appearance - Haze	63
D 1044	Washability, Brushability & Abrasion Testers - Taber	44-46
D 1084	Viscosity	5-17
D 1131	Viscosity - Krebs	13
D 1168	Coating Thickness	130-151
D 1186-A	Coating Thickness	130-151
D 1186-B	Coating Thickness	130-151
D 1200	Viscosity - Cups	5-10
D 1210	Fineness of Grind	1-4
D 1212	Wet Film Thickness	125-128
D 1212-D	Wet Film Thickness - Pfund	128
D 1223	Appearance - Gloss	60-62
D 1316	Fineness of Grind	1-4
D 1400	Coating Thickness	130-151
D 1455	Appearance - Gloss	60-62
D 1475	Density - Picnometer	18

Standard	Reference	Page
ASTM		
D 1525	Viscosity - Cups	5-10
D 1735	Corrosion - Kesternich	87
D 1737	Elongation & Resistance Deformation - Cylindrical Mandrel	55-56
D 1737	Adhesion - Cross Cut	153-155
D 2196	Viscosity - Cone of Plate	14-17
D 2200	Surface Cleanliness - Rust Standards	106
D 2200	Surface Profile	97-101
D 2240	Hardness - Shore	53
D 2243	Film Application & Test Charts - Test Charts	33-38
D 2244	Appearance - Colour	64-79
D 2246	Corrosion - Humidity	87-88
D 2247	Corrosion - Kesternich	87
D 2457	Appearance - Shade	63
D 2457	Appearance - Gloss	60-62
D 2486	Washability, Brushability & Abrasion Testers	41-46
D 2578-67	Viscosity - Suface Tension	12
D 2583	Hardness - Barcol	52
D 2794	Elasticity & Resistance Deformation - Impact Tester	57
D 2801	Film Application & Test Charts - Levelling & Sagging	23-38
D 2805	Appearance - Colour	64-79
D 2805	Film Application & Test Charts - Test Charts	33-38
D 3002	Adhesion	153-163
D 3002	Coating Thickness - Destructive	149-151
D 3022	Film Application & Test Charts	23-38
D 3134	Appearance - Colour	64-79
D 3258	Appearance - Shade	63
D 3278	Flash Point	21-22
D 3359	Adhesion - Cross Cut	153-155
D 3359	Adhesion	153-163
D 3359-B	Adhesion	153-163
D 3363	Hardness - Wolff-Wilborn	48
D 3389	Washability, Brushability & Abrasion Testers - Taber	44-46
D 3450	Washability, Brushability & Abrasion Testers	41-46
D 3794	Viscosity - Zahn	8
D 3828	Flash Point	21-22
D 3884	Washability, Brushability & Abrasion Testers - Taber	44-46
D 4060	Washability, Brushability & Abrasion Testers - Taber	44-46
D 4138	Coating Thickness - Destructive	149-151
D 4138	Coating Thickness	130-151
D 4158	Washability, Brushability & Abrasion Testers - Taber	44-46
D 4212	Viscosity - Shell	9
D 4212	Viscosity - Zahn	8
D 4213	Washability, Brushability & Abrasion Testers	41-46
D 4287	Viscosity - Cone & Plate	14-17
D 4366	Hardness - Pendulum	50
D 4414	Wet Film Thickness	125-128
D 4414-A	Wet Film Thickness	125-128
D 4417	Surface Profile	97-101
D 4541	Adhesion	153-163
D 4787	Pinhole & Porosity	165-170
D 4828	Washability, Brushability & Abrasion Testers	41-46
D 5071	Corrosion - Solar Box	89
D 5101-15	Powder Thickness Measurement - Non Contact	130
D 5162	Pinhole & Porosity Detection - High Voltage Method	168-170
D 5179	Adhesion	153-163
D 5342	Washability, Brushability & Abrasion Testers - Taber	44-46
D 5650	Washability, Brushability & Abrasion Testers - Taber	44-46
D 5682	Coating Conductivity	20
D 13278	Flash Point	21-22
E 96	Drying Time - Payne	40

Standard	Reference	Page
ASTM		
E 308	Appearance - Colour	64-79
E 313	Appearance - Colour	64-79
E 337-B	Climatic Condition Testing	107-113
E 376	Coating Thickness	130-151
E 430	Appearance - Haze	63
E 502	Flash Point	21-22
E 1164	Appearance - Colour	64-79
F 362	Washability, Brushability & Abrasion Testers - Taber	44-46
F 510	Washability, Brushability & Abrasion Testers - Taber	44-46
F 1319	Washability, Brushability & Abrasion Testers	41-46
F 1478	Washability, Brushability & Abrasion Testers - Taber	44-46
G 6	Pinhole & Porosity	165-170
G 12	Coating Thickness	130-151
G 62	Pinhole & Porosity	165-170
G 85	Corrosion - Salt Spray	84-86
BS		
729	Coating Thickness - Galvanising	130-151
1006	Corrosion - Solar Box	89
1344	Pinhole & Porosity	165-170
1881	Adhesion - Concrete	153-163
1881	Rebar Locators & Concrete Covermeters - Covermeters	180-184
1881 204	Material Thickness	91-96
1881 204	Rebar Locators & Concrete Covermeters - Covermeters	180-184
2842	Climatic Condition Testing	107-113
3900 A6	Viscosity - Cups	5-10
3900 A7	Viscosity - Cone & Plate	14-17
3900 A13	Flash Point	21-22
3900 C5 3	Coating Thickness - Destructive	149-151
3900 C5 5B	Coating Thickness - Destructive	149-151
3900 C5 6A	Coating Thickness	130-151
3900 C5 6B	Coating Thickness	130-151
3900 C5 7A	Wet Film Thickness	125-128
3900 C5 7B	Wet Film Thickness	125-128
3900 D5	Appearance - Gloss	60-62
3900 E1	Elongation & Resistance Deformation - Cylindrical Mandrel	55-56
3900 E2	Hardness - Clemen	49
3900 E4	Elongation & Resistance Deformation - Cupping Tester	56
3900 E5	Hardness - Clemen	49
3900 E5	Hardness - Pendulum	50
3900 E6	Adhesion - Cross Cut	153-155
3900 E6	Adhesion	153-163
3900 E9	Hardness - Buchholz	52
3900 E10	Adhesion	153-163
3900 E11	Adhesion	153-155
3900 E11	Elongation & Resistance Deformation - Conical Mandrel	55
3900 E13	Elongation & Resistance Deformation - Impact Tester	57
3900 F4	Corrosion - Salt Spray	84-86
4232	Surface Profile	97-101
5411 3	Coating Thickness	130-151
5411 11	Coating Thickness	130-151
5466	Corrosion - Salt Spray	84-86
5599	Coating Thickness	130-151
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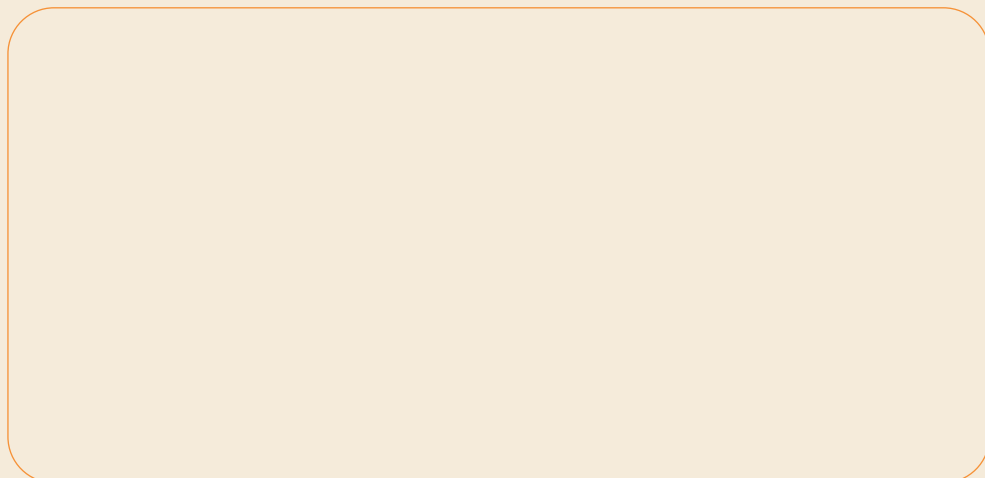
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