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elcometer®
inspection equipment



Elcometer 224
surface profile gauge

Elcometer 224

Separate Digital Surface Profile Gauge

The **Elcometer 224** provides the very latest in surface profile measuring technology for measuring profile on either flat or curved surfaces.

STANDARDS:

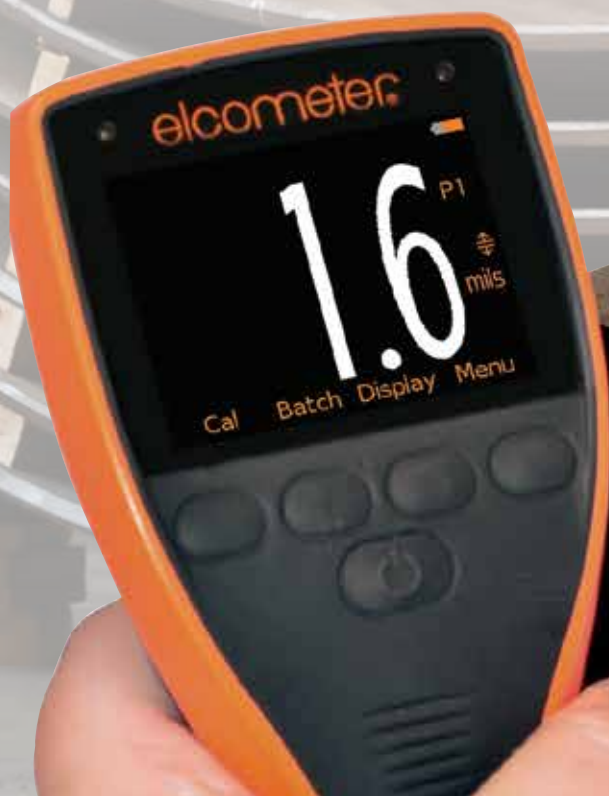
ASTM D 4417-B, SANS 5772,
SSPC PA 17, US Navy NSI 009-32,
US Navy PPI 63101-000

Integral & separate probe
options for flat and
convex¹ surfaces

USB and Bluetooth® data
output to ElcoMaster® software,
see page 12-2

Dust and water resistant rugged
design equivalent to IP64

Auto rotating display with
tap awake feature



¹Applicable Patents:
GB2505193, US9261345

Elcometer 224

Separate Digital Surface Profile Gauge

User Friendly

- Large buttons ideal for gloved hands
- Easy to use menu structure in multiple languages
- High contrast colour LCD with auto rotate
- High and low reading limit indicators
- Factory calibrated for immediate use

Accurate

- Can be used in accordance with National and International Standards
- Temperature stable measurements
- Statistics are calculated and displayed in real time
- Live and batch readings graph format for instant analysis

Reliability

- Repeatable and reproducible measurements
- 2 year gauge warranty²
- Supplied with fully traceable Test Certificates
- Batch & individual readings are date and time stamped

Tough

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP64
- Suitable for use in harsh environments
- Scratch and solvent resistant display
- Durable gauge and probe construction

Efficient

- Fast reading rate of 50+ per minute
- Integral and separate probe versions to suit your application
- Alpha numeric batch identification
- Compatible with ElcoMaster[®] software and ElcoMaster[®] Mobile App
- Powersave Mode with tap awake

Powerful

- User replaceable tough tungsten carbide tip, can be used for up to 20,000 readings
- USB and Bluetooth[®] data output to iPhone¹ or Android[™] devices
- Measures profiles up to 500µm (20mils)



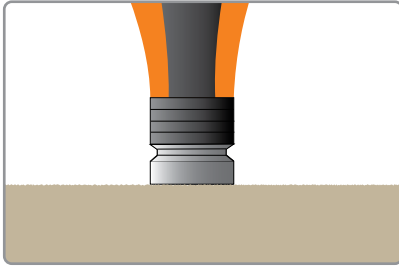
Integral or separate probes measure profiles up to 500µm (20mils)



Ergonomic design for comfort during continuous use



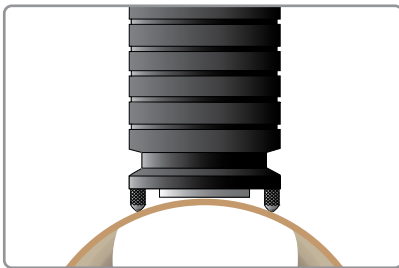
2.4" colour screen provides enhanced reading visibility at all angles

Elcometer 224**Separate Digital Surface Profile Gauge****Flat Surface Profile Probes**

Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer surface profile probes are supplied with a glass zero tile, calibration test foils (nominal values 125µm (5.0mils) & 508µm (20mils)) and an Elcometer test certificate.

**Technical Specification**

Range: 0-500µm (0-20mils)		Resolution: 1µm (0.1mil)		Accuracy: ±5% or ±5µm (±0.2mil)	
Probe Design	Part Number	Minimum Headroom	Minimum Sample Diameter	Certificate	
Flat Surface: Standard	T224C500US	125mm (4.92")	25mm (1.0")	●	
Flat Surface: Armoured	T224C500UARM	165mm (6.50")	25mm (1.0")	●	

**Convex Surface Profile Probes**

Supplied with either standard cables or armoured metal reinforced heavy duty cables, Elcometer convex surface profile probes are supplied with a glass zero tile, calibration test foils (nominal values 125µm (5.0mils) & 508µm (20mils)) and an Elcometer test certificate.

**Technical Specification**

Range: 0-500µm (0-20mils)		Resolution: 1µm (0.1mil)		Accuracy: ±5% or ±5µm (±0.2mil)	
Probe Design	Part Number	Minimum Headroom	Minimum Pipe Diameter	Certificate	
Convex Surface: Standard*	T224C500UX	135mm (5.31")	75mm (3.0")	●	
Convex Surface: Armoured*	T224C500UXARM	175mm (6.89")	75mm (3.0")	●	

Accessories

Part Number		Description
Integral Gauge	Separate Gauge	
T22419793	T22419793	Probe Tip Protection Cap
T22420072	T22420072	Glass Zero Tile with Wallet
T22421882C	T22421882C	Certified Calibration Test Kit: 125µm & 500µm (5 & 20mils) Calibration Foils, Glass Zero Tile & Calibration Certificate
T99921325	T99921325	USB Cable
T99924797	T99924797	USB Bluetooth® Adaptor (V2.0+) - for PCs without Bluetooth®
T99922341	T99922341	Self Adhesive Screen Protectors (Pack of 10)
T22420053	T22420053	Replacement Tip (Pack of 2) with Fixing Tool
T22420095	T22420095	Replacement Tip (Pack of 5)
-	T45622371	Benchtop Inspection Stand

● Test Certificate supplied as standard.
Elcometer 224 probes are covered by a 1 year warranty

* Applicable Patents: GB2505193, US9261345

Elcometer 224

Integral Digital Surface Profile Gauge

Fast, accurate and user friendly, the **Elcometer 224** is available with or without memory and Bluetooth®.

Review batch data or last 20 readings in a graph format

Time & date stamped measurements

Measurement capability to $\pm 5\%$

Stores up to 150,000 readings in up to 2,500 alphanumeric batches

Fast reading rate of 50+ readings per minute¹

Accurate, immediate and repeatable results

User replaceable tough tungsten carbide tips



STANDARDS:

ASTM D 4417-B, SANS 5772,
SSPC PA 17, US Navy NSI 009-32,
US Navy PPI 63101-000

¹ Up to 25 readings per minute for the convex probe

Elcometer 224

Digital Surface Profile Gauge

Product Features

■ Standard

□ Optional

	Model B	Model T
Fast, accurate reading rate; <i>50+ readings per minute</i> ¹	■	■
Repeatable & reproducible measurements	■	■
Easy to use menu structure; <i>in 30+ languages</i>	■	■
Tough, impact, waterproof & dust resistant; <i>equivalent to IP64</i>	■	■
Bright colour screen; <i>with permanent back light</i>	■	■
Scratch & solvent resistant display; <i>2.4" (6cm) TFT</i>	■	■
Large positive feedback buttons	■	■
Flat & convex surfaces ²	■	■
USB power supply; <i>via PC</i>	■	■
Test certificate	■	■
2 year gauge warranty ³	■	■
Automatic rotating display; <i>0°, 90°, 180° & 270°</i>	■	■
Ambient light sensor; <i>with adjustable auto brightness</i>	■	■
Emergency Light Mode	■	■
Gauge software updates ⁴ ; <i>via ElcoMaster® software</i>	■	■
Data output	■	■
USB; <i>to computer</i>	■	■
Bluetooth®; <i>to computer, Android™ & iOS⁵ devices</i>		■
On screen statistics	■	■
Number of readings, n ; Mean (average), $\bar{x}$; Standard deviation, σ ;	■	■
Highest reading, Hi ; Lowest reading, Lo ; Coefficient of variation, $CV\%$		
High & low limits; <i>definable audible & visual alarms</i>		■
Number above high limit;		■
Number below low limit;		■
ElcoMaster® software & USB cable		■
Date and time stamp <i>for each reading</i>		■
Replaceable screen protectors	■	■
Protective case	■	■
Plastic transit case	□	■
Measurement range	0-500µm (20 mils)	0-500µm (20 mils)
On screen calibration instructions; <i>in 30+ languages</i>	■	■
Number of batches		2,500
Gauge memory; <i>number of readings</i>	Last 5	150,000
Delete last reading	■ ⁶	■
Limits; <i>user definable audible & visual pass/fail warnings</i>		■
Gauge (g) or gauge & batch specific (gb) limits		gb
Batch types; <i>normal, counted average</i>		■
Review, clear & delete batches		■
Copy batches and calibration settings		■
Alpha-numeric batch names; <i>user definable on the gauge</i>		■
Fixed Batch Size Mode; <i>with batch linking</i>		■
Trend graph; <i>last 20 readings</i>		■
Review batch graph		■

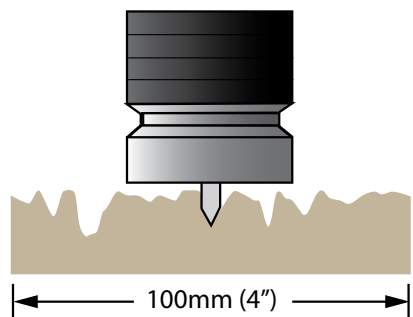
Model Options

Part Number	Description		Certificate
Integral Gauge	Separate Gauge ¹		
E224C-BI	E224C-BS	Elcometer 224 Model B Digital Surface Profile Gauge	•
E224C-TI	E224C-TS	Elcometer 224 Model T Digital Surface Profile Gauge	•

Technical Specification

Display Information	2.4" (6cm) QVGA colour TFT display, 320 x 240 pixels		
Battery Type	2 x AA batteries, rechargeable batteries can also be used		
Battery Life	Approximately 24 hours of continuous use at 1 reading per second ²		
Minimum Headroom	Integral:	185mm (7.3")	
	Separate:	See page 3-6	
Gauge Dimensions (h x w x d)	Integral:	168 x 73 x 37mm (5.61 x 2.87 x 1.46")	
	Separate:	141 x 73 x 37mm (5.55 x 2.87 x 1.46")	
Gauge Weight (including batteries)	Integral:	218g (7.69oz)	
	Separate:	161g (5.68oz)	
Measurement Range	0-500µm (0-20mils)		
Probe Tip	Tungsten carbide tip 60° angle; Tip Radius: 50µm (2mil)		
Operating Temperature	-10 to 50°C (14 to 122°F)	Storage temperature	-10 to 60°C (14 to 140°F)
Accuracy & Resolution	Accuracy ³ : ±5% or ±5µm (±0.2mil); Resolution: 1µm (0.1mil)		
Packing List ⁴	Elcometer 224 gauge, glass zero tile ⁴ , 2 x calibration foils ⁴ , wrist harness, plastic transit case (T), protective case, screen protector, probe protection cap ⁴ , 2 x AA batteries, test certificate, operating instructions, USB cable (T) & ElcoMaster® software (T)		

Measuring Surface Profile



1. Ensure probe is 90° to substrate to ensure accurate readings and calibrate the gauge on a glass zero tile.
2. To take one spot measurement, take either 5 or 10 readings within a 100mm (4") diameter area.
3. The measurement displayed is either the average peak-to-valley height or the maximum reading of the 5 or 10 readings, depending on which measurement mode you have selected.
4. To establish the average surface profile of an area, record 5 spot measurements for each 1m x 1m (3ft x 3ft) area.

¹ Probes are supplied separately, see page 3-8 for details.

² Using default settings & lithium batteries, alkaline or rechargeable batteries may differ.

³ Whichever is the greater.

⁴ For separate gauges, the test foils, glass zero tile and probe protection cap are supplied with the separate probe.

• Test Certificate supplied as standard.

Elcometer 123 Surface Profile Gauge

The Elcometer 123 Surface Profile Gauge is an easy to use analogue gauge which measures the peak-to-valley height of a blast cleaned surface in a similar way to the Elcometer 223 and Elcometer 224.

**STANDARDS:**

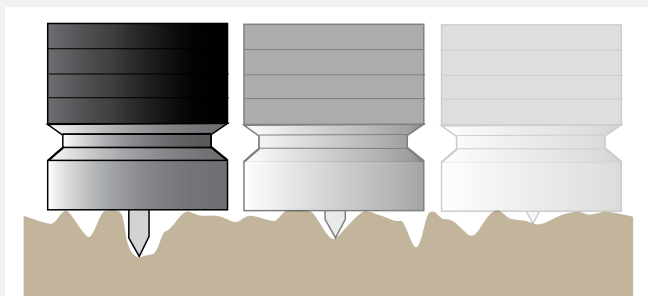
ASTM D 4417-B, SANS 5772, SSPC PA 17,
US Navy NSI 009-32, US Navy PPI 63101-000

Technical Specification

C

Part Number	Description	Certificate	
E123A--M-	Elcometer 123 Surface Profile Gauge, Metric	○	
Range	0 - 1000µm (0 - 40mils)	Scale	2µm (0.1 mil)
Dimensions	105 x 55 x 25mm (4.1 x 2.2 x 1")	Weight	335g (8oz)
Packing List	Elcometer 123 Surface Profile Gauge, glass slide, 2mm allen key, carry case and operating instructions		

How to measure surface profile



1. Calibrate on a glass zero tile.
2. Ensure probe is 90° to substrate to ensure accurate readings.
3. Take a minimum of 10 readings over an area to establish the average surface profile.

Elcometer 122 Testex® Replica Tape

Elcometer 122 Testex® Tape consists of foam with a non-compressible backing.

The foam side is rubbed into the surface providing a permanent mould of the peak-to-valley profile, which can then be measured using the Elcometer 124 Thickness Gauge.

Elcometer 122 Testex® Tape is available in four profile ranges. It is important that the tape grade chosen is reflective of the profile being measured.

- For profiles between 12 & 25µm (0.5 & 1.0mils): Coarse Minus Tape
- For profiles between 20 & 38µm (0.8 & 1.5mils): Coarse Tape
- For profiles between 38 & 64µm (1.5 & 2.5mils): Average of Coarse and X-Coarse Tape
- For profiles between 64 & 115µm (2.5 & 4.5mils): X-Coarse Tape
- For profiles greater than 115µm (4.5mils): X-Coarse Plus Tape

There are 50 tests in each roll.



STANDARDS:

ASTM D 4417-C, BS 7079-C5, ISO 8503-5, NACE RP0287, SSPC PA 17, US Navy NSI 009-32, US Navy PPI 63101-000

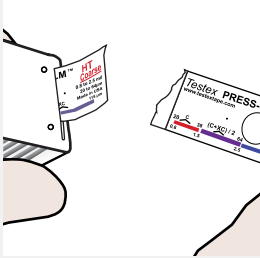
Technical Specification

Description	Profile Range		Part Number			
	Metric	Imperial	1 Roll	Pack of 10	Pack of 50	Pack of 100
Elcometer 122 Coarse Minus	12 - 25µm	0.5 - 1.0mils	E122----A1	E122----A10	E122----A50	E122----A100
Elcometer 122 Coarse	20 - 64µm	0.8 - 2.5mils	E122----B1	E122----B10	E122----B50	E122----B100
Elcometer 122 X-Coarse	38 - 115µm	1.5 - 4.5mils	E122----C1	E122----C10	E122----C50	E122----C100
Elcometer 122 X-Coarse Plus	116 - 127µm	4.6 - 5.0mils	E122----F1	E122----F10	E122----F50	E122----F100

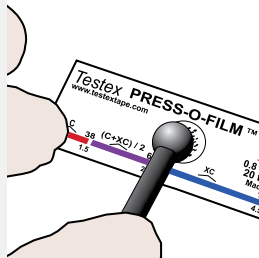
Accessories

T12222498	Swizzle Sticks (Pack of 5)
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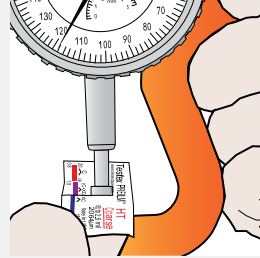
How to take a reading using the Testex® Replica Tape



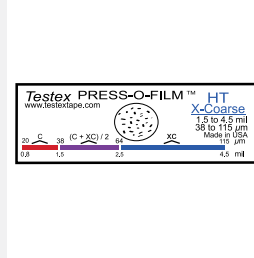
1. Tear off one section of the tape from the roll, peel off the backing tape and retain the back if required for future use.



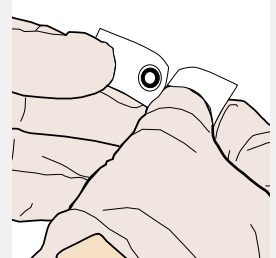
2. Stick the tape on to the test surface, and rub the central portion using the swizzle stick provided, or the end of a pen, pencil or similar rounded object until dark spots appear. This gives a surface replica.



3. Using a micrometer such as the Elcometer 124 Foil Thickness Gauge, measure the thickness of the central portion of the tape replica and subtract 50µm (2mils) from the reading. This result is the peak-to-valley profile height. Write the value on the tape.



4. If the value falls within the purple band on the coarse tape (38-64µm) then repeat the test as shown in step 2 using the extra coarse tape and then average the two values.



5. If the tape is required for future reference, replace the backing tape to preserve the imprinted profile.

Elcometer 124 Thickness Gauge

The Elcometer 124 Thickness Gauge is used to measure the peak-to-valley height of a surface profile moulded in the Elcometer 122 Testex® Replica Tape.

- Metric and Imperial versions available
- Quick and easy to use
- Anvil pressure as required in the Standards

**STANDARDS:**

ASTM D 4417-C, ISO 8503-5, NACE RP 0287,
SSPC PA 17, US Navy NSI 009-32, US Navy PPI 63101-000

Technical Specification

C

Part Number	Description	Range	Dimensions	Weight	Scale Resolution	Certificate
E124---3M	Elcometer 124 Metric	5mm	120 x 95 x 25mm	254g	2µm	○
E124---3E	Elcometer 124 Imperial	0.25"	4.7 x 3.7 x 1.0"	9oz	0.1mil	○

Elcometer 125 Surface Comparators

These extremely durable comparators allow the estimation of surface profile of either grit or shot blasted surfaces.

Using the Elcometer 125 surface comparators as a reference profile grades in each comparator. Profiles are recorded in microns.

- 4 Profile Values per Comparator



STANDARDS:

AS 3894.5, ASTM D 4417-A, IMO MSC.215(82), IMO MSC.244(83), ISO 8503-1, ISO 8503-2, SSPC PA 17

Technical Specification

Part Number	Description	Section Profiles
E125----1	Elcometer Grit Surface Comparator	25, 60, 100, 150µm
E125----2	Elcometer Shot Surface Comparator	25, 40, 70, 100µm

Elcometer 127 Keane- Tator Surface Comparators & Magifier

The Elcometer 127 range of Surface Comparators are available in sand, shot or grit surface profiles.

Each comparator is supplied with 5 profile grades ranging from 0.5 - 5.5mils. Designed for use with the Elcometer 127 illuminated magnifier, each comparator has a hole in the centre allowing for clear visual comparisons to be made.

- 5 Profile Values per Comparator



STANDARDS:

AS 3894.5, ASTM D 4417-A, SSPC PA 17

Technical Specification

Part Number	Description	Section Profiles
E127----2	Elcometer 127 Sand Surface Comparator	0.5, 1, 2, 3, 4 mils
E127----3	Elcometer 127 Grit Surface Comparator	1.5, 2, 3, 4, 5 mils
E127----4	Elcometer 127 Shot Surface Comparator	2, 2.5, 3, 4, 5.5 mils
E127----1	Illuminated magnifier (x 5) with integrated surface comparator holder	

Elcometer 129 Rubert & Rugotest Surface Comparators

The Elcometer 129 Surface Comparators are available in two models:

- Elcometer 129 Rubert - available in grit and shot versions
- Elcometer 129 Rugotest - shot and grit profiles on the same block

Roughness is displayed in both “classes” and “roughness averages” for easier identification.

Available in Metric only.

6 Roughness Values per Comparator



STANDARDS:

AS 3894.5

Technical Specification

Part Number	Description	Section Profiles
E129----1	Elcometer 129/1 Rubert Grit Surface Comparator	0.4, 0.8, 1.6, 3.2, 6.3, and 12.5µm
E129----2	Elcometer 129/2 Rubert Shot Surface Comparator	0.4, 0.8, 1.6, 3.2, 6.3, and 12.5µm
E129----3	Elcometer 129/3 Rugotest Shot & Grit Surface Comparator	N6, N7, N8, N9, N10 and N11 equivalent to 0.8, 1.6, 3.2, 6.3, 12.5, and 25µm roughness averages respectively

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