

# elcometer® **456 Dry Film Thickness Gauge**



The new version of the **Elcometer 456 Coating thickness Gauge** now benefits from a larger display for easy data viewing and a simple calibration feature to make testing even quicker.

The **Elcometer 456** also features **Bluetooth® wireless technology** for fast data transfer to the new **ElcoMaster Software™**, ideal for easy report generation and archiving of readings. The **Bluetooth®** feature also allows the Elcometer 456 to connect to PDA's and mobile phones for instant reporting and e-mailing from the field.

This No 1 Seller in the market is available in any combination of Basic, Standard, and Top functionality; together with Integral (built in) or 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.

## Features

- **Fast, accurate & easy to use** Paint & Coating Thickness Gauge New Model Features a larger display screen
- **Greater than 60 readings per minute** for fast results.
- **Unrivalled accuracy and repeatability** for the ultimate hand-held performance.
- Available as an **integral or plug-in separate probe** version for total versatility.
- **Full, menu driven, graphics display** for ease of use with calibration & on screen instructions in 25 languages.
- 3 versions available - **basic, standard & top** - to meet your specific requirements.
- **Ergonomic** in styling for the ultimate in hand held comfort.
- **Calibration Foils** included. **ISO, NBS** (with traceable calibration report) and **working foils** available. Provides traceable accuracy for calibration adjustment carried out on the User's own substrate.
- **Full statistical data display** allows the user to view all or any statistics from Number of readings, Mean, Standard Deviation, Highest & Lowest Reading and Coefficient of Variation
- **One Year Guarantee on Unit** and three month guarantee on probes
- **Portable:** Hand held battery powered instrument. (comparable to the size of a computer mouse)
- **Memory:** Standard and Top gauges offer secure data storage.
- **Bluetooth®:** Wireless connectivity from the gauge to a PC or a mobile phone and new **ElcoMaster Software™**
- **PSPC Ready:** 90/10 rule with autocheck feature – to meet IMO MSC.215 (82) & MSC.216(82) performance standard for protective coatings in ballast tanks

## Can be used in accordance with:

### Ferrous (F)

ISO 2178  
ISO 2808-6Aa  
ISO 19840  
ASTM B 499  
ASTM D 1186  
ASTM D 7091

BS 5411-11  
BS 3900-C5-6Aa  
BS EN ISO 1461  
DIN 50981  
SSPC-PA2

### Non-Ferrous (NF)

ISO 2360  
ISO 2808-6Ba  
ASTM D 1400  
ASTM B 244

BS 5411-3  
BS 3900-C5-6Ba  
BS 5599  
DIN 50984

### Dual Ferrous (F) & Non-Ferrous (NF)

All of the Ferrous and Non-Ferrous List plus; ASTM E 376

### All Elcometer 456<sup>3</sup> Models

IMO MSC.215 (82)  
IMO MSC.216 (82)



BAMR (Pty) Ltd, PO Box 23973, Claremont, 7735, South Africa  
Ph : 27 (0)21 683 2100, Fax : 27 (0)21 674 1485  
Email : sales@bamr.co.za, Web : www.bamr.co.za

## 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 any other type 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 (FNF), Elcometer can provide you with 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 Coatings'.

### The Language of Coatings

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 a Dual FNF gauge.

#### 3. Typically what sort of coating thickness do you need to measure?

This helps you select the correct scale range - Scale 1 measures coatings to 1500µm, Scale 2 : 5mm, Scale 3 : 13mm

#### 4. 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™ (separate probe is directly attached to the base of the instrument – providing, in your separate gauge, 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 (90°) and Telescopic options
- *Miniature Probes:* Including Straight, Right Angle (90°), 45° Angle all in either long or short versions.

#### 5. 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, links via infrared to a Printer but no memory or data output
- *Standard Gauge* - with statistics, links via infrared to a Printer, limited memory (250 readings) and data output
- *Top Gauge* - with statistics, links via infrared to a Printer, enhanced memory (40,000 readings), batching capability and data output.

## Measurement Options

**Ferrous (F)** operation using electromagnetic induction probes for all non-magnetic coatings on a ferrous (magnetic) substrate, e.g. paint, plastic, enamel, powder, rubber, ceramic, galvanising, zinc, sprayed metal (aluminium or zinc), etc. on steel, cast iron, ferritic and duplex stainless steel, substrates etc.

**Non-Ferrous (N)** operation using eddy current probes for non-conductive coatings on non-ferrous metal substrates, e.g. anodising, paint, powder, lacquer, plastic, etc. on aluminium, brass, zinc, stainless steel, copper, titanium substrates etc.

**Dual (FNF)** operation combines the Ferrous and Non-Ferrous operation in a single probe. The gauge has user selection for auto or manual substrate determination.

## Shipping List

**Basic :** Unit, Pouch, Calibration Certificate, Calibration Foils - 4 x 2% NBS Foils, Batteries, Wrist Cord, Instructions

**Standard :** Same as Basic Unit plus : Software CD ( ElcoMaster and EDTS+ )

**Top :** Same as Basic Unit plus : Software CD ( ElcoMaster and EDTS+ )



BAMR (Pty) Ltd, PO Box 23973, Claremont, 7735, South Africa  
Ph : 27 (0)21 683 2100, Fax : 27 (0)21 674 1485  
Email : sales@bamr.co.za, Web : www.bamr.co.za

# Elcometer 456 Gauge Features - Technical superiority in the palm of your hand

The 456, whilst easy to use, is packed with features, making it possibly the best coating thickness gauge in the world.

## Features

	<u>456 Basic</u>	<u>456 Std</u>	<u>456 Top</u>
Fast, accurate reading rate >60 readings per minute	•	•	•
Auto substrate recognition on FNF models	•	•	•
Integral and separate probe models available	•	•	•
Backlight – user selectable ideal for dark environments	•	•	•
Beeper	•	•	•
Intuitive menu driven display with adjustable text size	•	•	•
Large easy to read Maximised gauge reading display	•	•	•
Languages – menus in 26 languages	•	•	•
User definable limits – <i>Green / Red LEDs for Pass / Fail Inspection</i>	•	•	•
User definable on-screen statistics <i>(from single readings or within batches)</i>	•	•	•
<i>(No. of readings, Mean, Hi / Lo readings, Std Deviation &amp; Co-efficient of Variation)</i>	•	•	•
Fully Interchangeable Separate Probe Options – <i>incl Miniature</i>	•	•	•
On-screen Calibration Instructions / Help function	•	•	•
User switchable Normal / Extended menu options	•	•	•
Calibration options (stated):	•	•	•
- <i>smooth, 2 point, rough surfaces &amp; special substrate</i>	•	•	•
- <i>zero offset*† (subtracts a fixed value from reading)</i>	•	•	•
- <i>ISO, SSPC, Swedish and Australian predefined</i>	•	•	•
90/10 rule with autocheck feature – to meet IMO MSC.215 (82) & MSC.216(82) performance standard for protective coatings in ballast tanks	•	•	•

## Memory

	250 in one batch	40000 in up to 999 batches
Readings Memory		
Individual reading mode	•	•
Average and Counted Average	•	•
Individual Reading Review	•	•
Date and time stamp with clock and alarm functions – <i>readings can be stamped including the last calibration date and time</i>		•
Batch calibrations – each batch can be programmed with a different calibration		•
Batch calibration cloning – copy calibrations between batches		•

## Data Output

	250 in one batch	40000 in up to 999 batches
RS232	•	•
Available with Bluetooth® wireless technology	•	•
Immediate output mode – each reading is transmitted as it is taken	•	•
Batch output mode – send data by batches on command	•	•
Free PC software – ElcoMaster™ & ElcoMaster™ Mobile	•	•

\* Zero Offset, USA patent Number 6243661 †Zero offset subtracts a user defined value from the reading. Ideal for ISO 19840

## Elcometer 456 Gauge Technical Specifications

Measurement Speed :	Greater than 60 readings per minute
Accuracy :	+/- 1 to 2% using two point Calibration (3% Full Scale)
Display :	STN Graphics (LCD), 128 x 64 pixels; 19.8 x 39.6mm
Battery Type :	2 x AAA (LR03) Rechargeable batteries can 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 :	Ferrous: 0.3mm; Non-Ferrous: 0.1mm unless special calibration adjustment is made
Measurement Options :	Ferrous (F), Non Ferrous (NF) and Dual (FNF)
Operating Temperature :	0 - 50°C
Dimensions :	128 x 68 x 28mm
Weight (incl. Dry Batteries) :	130g

## Elcometer 456 Integral Gauge

BAMR (Pty) Ltd, PO Box 23973, Claremont, 7735, South Africa  
 Ph : 27 (0)21 683 2100, Fax : 27 (0)21 674 1485  
 Email : sales@bamr.co.za, Web : www.bamr.co.za





The Elcometer 456 Integral (built in) Probes offer an ideal gauge for flat or uneven surfaces alike. The large 'Bigfoot™' probe allows for consistent and repeatable results as there is no cable, the gauge can take readings using one hand.

The Elcometer 456 Integral Gauges are ideal for measurement on both organic and inorganic coatings and are available in either:

- Ferrous (F),
- Non-Ferrous (NF), or
- Both Ferrous and Non-Ferrous (FNF)

#### Features of the Elcometer 456 Integral Gauges

- Single handed operation.
- Wide footprint to give greater stability, accuracy & repeatability of readings.
- Ideal for flat & curved surfaces.
- Can be used on smooth & blast profiled substrates.
- Wide range of thickness scales available.

### Elcometer 456 Integral Gauge - Specifications and Part Numbers

<u>Substrate</u>	<u>Model</u>	<u>Probe</u>		<u>Scale</u>	<u>Part Number</u>
Ferrous	Basic Model	Integral	Ferrous Basic Integral Scale 1	0 - 1500 mic	A456FBI1
Ferrous	Basic Model	Integral	Ferrous Basic Integral Scale 12 - High Resolution	0 - 5 mm	A456FBI12
Ferrous	Basic Model	Integral	Ferrous Basic Integral Scale 3	0 - 13 mm	A456FBI3
Non Ferrous	Basic Model	Integral	Non Ferrous Basic Integral Scale 1	0 - 1500 mic	A456NBI1
Both F & NF	Basic Model	Integral	Dual Basic Integral Scale 1	0 - 1500 mic	A456FNFB11
Ferrous	Standard Model	Integral	Ferrous Standard Integral Scale 1	0 - 1500 mic	A456FSI1
Ferrous	Standard Model	Integral	Ferrous Standard Integral Scale 12 - High Resolution	0 - 5 mm	A456FSI12
Ferrous	Standard Model	Integral	Ferrous Standard Integral Scale 3	0 - 13 mm	A456FSI3
Non Ferrous	Standard Model	Integral	Non Ferrous Standard Integral Scale 1	0 - 1500 mic	A456NSI1
Both F & NF	Standard Model	Integral	Dual Standard Integral Scale 1	0 - 1500 mic	A456FNFSI1
Ferrous	Top Model	Integral	Ferrous Top Integral Scale 1	0 - 1500 mic	A456FTI1
Ferrous	Top Model	Integral	Ferrous Top Integral Scale 12 - High Resolution	0 - 5 mm	A456FTI12
Ferrous	Top Model	Integral	Ferrous Top Integral Scale 3	0 - 13 mm	A456FTI3
Non Ferrous	Top Model	Integral	Non Ferrous Top Integral Scale 1	0 - 1500 mic	A456NTI1
Both F & NF	Top Model	Integral	Dual Top Integral Scale 1	0 - 1500 mic	A456FNFTI1

The F1 2 Scale combines the F1 Scale and F2 Scale in a single probe (Patent applied for) with the user selecting the appropriate range (and hence resolution) for the work in hand. Resolution similar to Scale 1 for 0 – 1500 mic range and similar to Scale 2 for 1500 mic to 5 mm range.

### Elcometer 456 Separate Gauge



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.

#### Features of the Elcometer 456 Separate (Plug in) Probe Option

- A wide range of probes available for measurements in almost any environment.
- Fully interchangeable probes:
- 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
- Ideal for measuring coating thickness in small & large, smooth & curved, open air or confined environments.

### Elcometer 456 Separate Gauge - Specifications and Part Numbers



BAMR (Pty) Ltd, PO Box 23973, Claremont, 7735, South Africa  
 Ph : 27 (0)21 683 2100, Fax : 27 (0)21 674 1485  
 Email : sales@bamr.co.za, Web : www.bamr.co.za



<b><u>Substrate</u></b>	<b><u>Model</u></b>	<b><u>Probe</u></b>	<b><u>Description</u></b>
Ferrous	Basic Model	Separate	Ferrous Basic Integral Scale 1
Ferrous	Basic Model	Separate	Ferrous Basic Integral Scale 12 - High Resolution
Ferrous	Basic Model	Separate	Ferrous Basic Integral Scale 3
Non Ferrous	Basic Model	Separate	Non Ferrous Basic Integral Scale 1
Both F & NF	Basic Model	Separate	Dual Basic Integral Scale 1
Ferrous	Standard Model	Separate	Ferrous Standard Integral Scale 1
Ferrous	Standard Model	Separate	Ferrous Standard Integral Scale 12 - High Resolution
Ferrous	Standard Model	Separate	Ferrous Standard Integral Scale 3
Non Ferrous	Standard Model	Separate	Non Ferrous Standard Integral Scale 1
Both F & NF	Standard Model	Separate	Dual Standard Integral Scale 1
Ferrous	Top Model	Separate	Ferrous Top Integral Scale 1
Ferrous	Top Model	Separate	Ferrous Top Integral Scale 12 - High Resolution
Ferrous	Top Model	Separate	Ferrous Top Integral Scale 3
Non Ferrous	Top Model	Separate	Non Ferrous Top Integral Scale 1
Both F & NF	Top Model	Separate	Dual Top Integral Scale 1

The above Part Numbers include the Standard Probes. For further options of separate probes see the Elcometer 456 Probe Option leaflet.

## Separate Probe Types

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 or 150mm probe lengths.



### PINIP™ Probes (F, NF & FNF)

The Plug-In Integral Probe (PINIP™), has been designed to be screwed into the base of any separate Elcometer 456 gauge to transform their 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°C



### Waterproof Probes (F)

Ideal for taking measurements in wet conditions or underwater up to depths of 10m. Waterproof probes are available with standard, 5m and 15m probe lead lengths.

## Major Users of the 456 and the superceded 345 :

CSIR & SABS • SA Navy • Defence Force & Armscor • SA Navy • Denel • Naschem • Sonchem • ALL MAJOR Motor Assemblers incl. Daimler Benz • Nissan • Ford / Mazda • BMW • Toyota • VW etc • MAJOR Industrial Painters eg. RJ Southey • Gordon Bennett etc • Paint Manufacturers : Plascon • Dulux • Dekro etc • Corrosion Consultants / Inspectors • Anodisers incl Huletts • Portnet • Spoornt & SATS • Transwerk & Transnet • ESKOM • ISCOR • Public Works • SASOL & Mossgas • Shell, BP & Caltex Refineries • Anglo American & Vaal Mines & Others • Telkom • SA Airways & Atlas • Atomic Energy Board • Water Boards • Dept Water Affairs • Dorbyl & Heavy Engin • Universities • Govt & Municipal Authorities • Powder Coaters • Pipeline Co's • Sand / Shot Blasters • Metal Fabricators • Galvanisers • Shipbuilders



BAMR (Pty) Ltd, PO Box 23973, Claremont, 7735, South Africa  
Ph : 27 (0)21 683 2100, Fax : 27 (0)21 674 1485  
Email : sales@bamr.co.za, Web : www.bamr.co.za