

**Elcometer 415**

**Coating Thickness Gauge**

**Operating Instructions**



**Equipment described in these instructions is covered by the following Patents:**

FNF UK Patent No: GB2306009B, FNF US Patent No: 5886522



This product meets the Electromagnetic Compatibility Directive.

The product is Class B, Group 1 ISM equipment according to CISPR 11

Group 1 ISM product: A product in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.

Class B product are suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

elcometer® is a registered trademark of Elcometer Limited.

All other trademarks acknowledged.© Copyright Elcometer Limited. 2009-2012.

All rights reserved. No part of this Document may be reproduced, transmitted, transcribed, stored (in a retrieval system or otherwise) or translated into any language, in any form or by any means (electronic, mechanical, magnetic, optical, manual or otherwise) without the prior written permission of Elcometer Limited.

A copy of this Instruction Manual is available for download on our Website via [www.elcometer.com](http://www.elcometer.com).

## CONTENTS

---

Section	Page
1 About your gauge . . . . .	2
2 What the box contains . . . . .	3
3 Getting started. . . . .	4
4 Taking a reading . . . . .	7
5 The menu . . . . .	8
6 Adjusting gauge calibration . . . . .	9
7 Probes . . . . .	9
8 Storage. . . . .	10
9 Maintenance . . . . .	10
10 Technical data . . . . .	11
11 Accessories . . . . .	12
12 Related equipment . . . . .	13

Thank you for your purchase of this Elcometer 415 Coating Thickness Gauge. Welcome to Elcometer.

Elcometer are world leaders in the design, manufacture and supply of coatings inspection equipment. Our products cover all aspects of coating inspection, from development through application to post application inspection.

The Elcometer 415 Coating Thickness Gauge is a world beating product. With the purchase of this gauge you now have access to the worldwide service and support network of Elcometer. For more information visit our website at [www.elcometer.com](http://www.elcometer.com)

## 1 ABOUT YOUR GAUGE

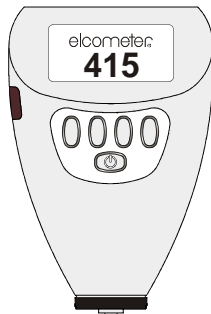
---

The Elcometer 415 Coating Thickness Gauge is a handheld gauge for fast and accurate measurement of the thickness of coatings on smooth, flat, unblasted<sup>a</sup> metal substrates.

Your gauge features an easy to use menu-driven graphical interface which guides the user through tasks such as gauge configuration and calibration adjustment.

The probe in your gauge is suitable for measurement on ferrous steel and on non-ferrous aluminium substrates.

These instructions include images of Elcometer 415 screens with units set to microns ( $\mu\text{m}$ ). Similar screens will be seen when the gauge is set to mils.



- 
- a. The Elcometer 415 is not suitable for use on blasted substrates. For this application, contact Elcometer for information on the Elcometer 456 Coating Thickness Gauge.

## 1.1 STANDARDS

The Elcometer 415 can be used in accordance with the following National and International Standards:

AS 2331.1.4, AS/NZS 1580.108.1, ASTM B 499, ASTM D 7091 *supersedes ASTM D 1186-B & ASTM D 1400*, ASTM E 376, BS 5599, EN 13523-1 *supersedes ECCA T1*, ISO 2360 *supersedes BS 5411-3*, ISO 2808-7C *supersedes ISO 2808-6A*, BS 3900-C5-6A, BS 5411-11 & DIN 50981, ISO 2808-7D *supersedes BS 3900-C5-6B*, BS 5411-3, DIN 50984 & ISO 2808-6B, ISO 2808-12, NF T30-124.

## 2 WHAT THE BOX CONTAINS

---

- Elcometer 415 Gauge
- 4 x Check Foils: 50, 125, 500 and 1000  $\mu\text{m}$  / 2, 5, 20, and 40 mils (Paint and Powder Gauge only)
- 4 x Check Foils: 25, 75, 125 and 250  $\mu\text{m}$  / 1, 3, 5, and 10 mils (Automotive Gauge only)
- Ferrous Checkpiece (Automotive Gauge only)
- Non-Ferrous Checkpiece (Automotive Gauge only)
- Carry Case
- Batteries
- Operating Instructions

The gauge is packed in cardboard and plastic packaging. Please ensure that this packaging is disposed of in an environmentally sensitive manner. Consult your Local Environmental Authority for further guidance.

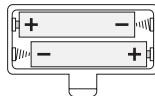
**To maximise the benefits of your new Elcometer 415, please take some time to read these Operating Instructions. Do not hesitate to contact Elcometer or your Elcometer supplier if you have any questions.**

## 3 GETTING STARTED

Before you use your gauge for the first time, remove the paper strip from the battery compartment.


### 3.1 FITTING BATTERIES

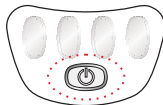
Batteries are located under the cover at the rear of the gauge. Use two LR03 (AAA), alkaline dry batteries, or rechargeable equivalent; take care to ensure correct battery polarity.



### 3.2 SWITCHING THE GAUGE ON AND OFF

To switch your gauge on, press , or place the probe on any surface.

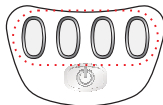
The gauge switches off automatically after 60 seconds; to switch off manually, press and hold .



### 3.3 THE KEYPAD

The gauge is controlled by four 'softkeys'.

The function of these softkeys varies and is described by symbols and words on the bottom line of the screen.



### 3.4 INTERFACE

An interface is located on the side of your gauge. This interface is used to program the gauge at the factory and has no function for users of the gauge.



### 3.5 SELECTING A LANGUAGE

The Elcometer 415 has over 20 languages built-in.

When the gauge is switched on for the first time after batteries have been fitted, the display will show the language selection screen.

Press **↑** or **↓** to locate your language, then press **SEL**. The gauge operates in the new language until changed.

#### TO CHANGE LANGUAGE AT ANY TIME


*Either:*

1. Switch gauge off.
2. Press and hold left hand softkey.
3. Press  to switch on gauge.
4. Release left hand softkey.
5. Press **↑** or **↓** to locate your language, then press **SEL**. The gauge operates in the new language until changed.

*Or:*

Select MENU/SETUP/LANGUAGES

### 3.6 THE SYMBOLS ON THE DISPLAY

	<p>Battery condition indicator.</p> <p>When the battery condition indicator flashes and the gauge beeps every 10 seconds, change the batteries.</p> <p>When the batteries are exhausted, the gauge emits five loud beeps and then switches off.</p>
<b>Fe/NF</b>	<p>Substrate type.</p> <p>Fe = Ferrous, NF = Non-Ferrous metal</p>
<b>µm/mil</b>	<p>Measurement units.</p>
<b>MENU</b>	<p>Press to access user-selectable features and gauge information</p>



## 4 TAKING A READING

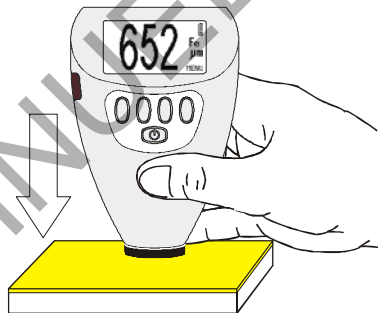
---

1. Hold the gauge with the probe pressed firmly<sup>b</sup> against the surface you are measuring.

If the gauge is off, it will switch on automatically.

2. Read the coating thickness shown on the display.

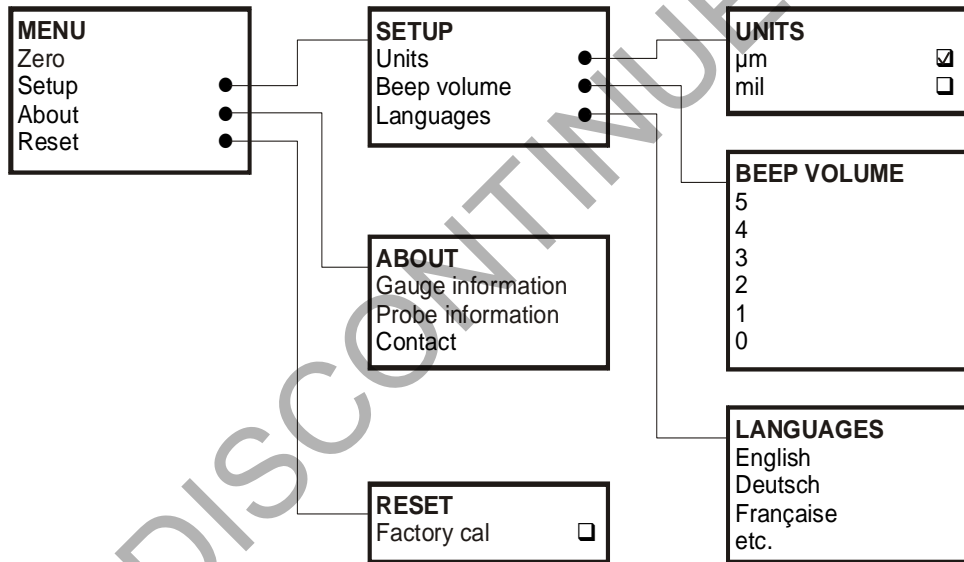
The display also shows the substrate type (Ferrous or Non-ferrous) and the measurement units ( $\mu\text{m}$  or mil).



- 
- b. The reading may be inaccurate if the probe is not held flat against the surface.

## 5 THE MENU

Press the MENU button to access all features of your gauge:



## 6 ADJUSTING GAUGE CALIBRATION

---

Before taking measurements, always adjust the calibration of your gauge by zeroing your gauge on uncoated steel or aluminium sample having the same substrate thickness and a similar smooth surface finish as the item to be measured.

1. Select MENU/ZERO
2. When indicated by the display, place the probe on the uncoated substrate.

The display will show 0  $\mu\text{m}$  (or 0.0 mil) and is immediately ready to use.

You may wish to test the calibration using the foils supplied with your gauge.

If a sample of uncoated substrate is not available, use the factory calibration zero:

Select MENU/RESET/FACTORY CAL/YES.

## 7 PROBES

---

The probe is a consumable item and will eventually wear. Probe life will depend on the number of measurements taken and how abrasive the coating is. Probe life can be prolonged by careful positioning of the probe on the surface. If the probe becomes worn or damaged, return your gauge to Elcometer for probe replacement and re-programming.

## 8 STORAGE

---



This gauge incorporates a Liquid Crystal Display (LCD). If the display is heated above 50°C (120°F) it may be damaged. This can happen if the gauge is left in a car parked in strong sunlight.

Always store the gauge in its carrying pouch when it is not being used.

Remove the batteries from the gauge and store them separately if the gauge is to remain unused for a long period of time. This will prevent damage to the gauge in the event of malfunction of the batteries.

## 9 MAINTENANCE

---

You own one of the finest hand-held coating thickness gauges in the world. If looked after, it will last a lifetime.

The gauge does not contain any user-serviceable components. In the unlikely event of a fault, the gauge should be returned to your local Elcometer supplier or directly to Elcometer. The warranty will be invalidated if the gauge has been opened.

Contact details can be found:

- Stored in the gauge (Select MENU/ABOUT/CONTACT).
- On the outside cover of these operating instructions.
- At [www.elcometer.com](http://www.elcometer.com)

## 10 TECHNICAL DATA

---

Range:	0 $\mu\text{m}$ to 1000 $\mu\text{m}$ (0 mils to 40 mils)
Accuracy:	$\pm 3\%$ or $\pm 3 \mu\text{m}^{\text{c}}$ ( $\pm 0.12 \text{ mil}$ )
Resolution:	1 $\mu\text{m}$ (0.1 mils)
Measurement speed:	>60 readings per minute
Weight:	130g (4.1oz)
Dimensions:	110 mm x 75 mm x 35 mm (4.3" x 3" x 1.38")
Operating temperature (ambient <sup>d</sup> ):	0°C to 50°C (32°F to 120°F)
Operating temperature, maximum (probe):	80°C (176°F)
Storage temperature:	-10°C to 55°C (14°F to 130°F)
Case:	High impact ABS
Batteries:	2 x LR03 (AAA), alkaline <sup>e</sup> dry batteries or rechargeable <sup>f</sup> equivalents.

- 
- c. Whichever is the greater.
- d. Operation outside these limits depends upon climatic conditions. If required, contact Elcometer for further information.
- e. Alkaline batteries must be disposed of carefully to avoid environmental contamination. Please consult your local environmental authority for information on disposal in your region.  
**Do not dispose of any batteries in fire.**
- f. Rechargeable batteries can be used if they are charged outside the gauge.

## 11 ACCESSORIES

---

The following accessories and spares are available from Elcometer, or your local Elcometer supplier.

### 11.1 COATING THICKNESS STANDARDS

Ferrous 0, 50, 150, 250, 500µm (0, 2, 6, 10, 20 mils): T995111261

Ferrous 0, 40, 75, 125, 175µm (0, 1.6, 3, 5, 7 mils) T995111262

Non-Ferrous 0, 40, 75, 125, 175µm (0, 1.6, 3, 5, 7 mils): T995111271

### 11.2 CHECKPIECES

Ferrous: T99916925

Non-Ferrous: T99916901

### 11.3 FOILS

25 µm / 1 mil: T99022570-2A

50 µm / 2 mils: T99022570-4A

75 µm / 3 mils: T99022570-6A

125 µm / 5 mils: T99022570-7A

250 µm / 10 mils: T99022570-10A

500 µm / 20 mils: T99022570-12A

1000 µm / 40 mils: T99022570-14A

## 12 RELATED EQUIPMENT

---

Elcometer produces a wide range of coating thickness gauges and associated paint inspection equipment. Users of the Elcometer 415 may also benefit from the following Elcometer products:

- Uncured powder thickness gauges
- Inspection management software
- Mechanical coating thickness gauges
- Elcometer 456 Coating Thickness Gauge
- Appearance testers
- Adhesion testers

For further information contact Elcometer, your local Elcometer supplier or visit [www.elcometer.com](http://www.elcometer.com)