



DFT  
Fineness of Grind, Density  
Flow & Dip Cups  
Rotational Viscosity  
Flash Point, Impact Testers  
Washability & Abrasion Testers  
Film Applicators, Bend Testers, Gloss  
Thickness Gauges, Surface Profile, Wet Film  
Dry Film, Coating Thickness Gauges  
Climatic Testing, Adhesion, Pinhole Testers  
Porosity, Software, Dispersion, Inspection Kits  
Zahn Cups, Motorised Film Applicators  
Drying Time Recorders, Washability, Abrasion  
Scratch & Hardness, Elasticity & Deformation  
Surface Cleanliness, DOI Gloss Meters  
Colour, Moisture, Dewpoint Meters  
Cross-Hatch, Oven Recorders  
Surface Contamination  
ElcoMaster™



Elcometer 506  
pull off adhesion gauge

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



## Quality is part of the Elcometer culture

Elcometer's commitment to quality is reflected in our ISO 9000 Quality and ISO 14001 Environmental certifications.

It is the Company philosophy to integrate quality into all aspects of the product - whether it be the initial product design, the manufacture of our product or in our commitment to our customers.

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

## Certification

Elcometer's products are designed and manufactured to the highest levels of quality ensuring that we can provide relevant certification where necessary.

To meet the various inspection requirements we offer the following certification, dependent on the product:

*Certificate of Calibration:* issued for Fixed Calibration equipment and shows readings and traceability

*Accredited Certificate:* can be issued for Fixed Calibration Equipment and a full UKAS traceable certificate is issued from an independent Calibration Laboratory

*Certificate of Test:* for variable calibration equipment and supplied with readings. A Certificate of Inspection states the instrument is tested in accordance with our procedures.

## Fit for Purpose - Standards Explained

All Elcometer products are designed to comply with National and International Standards. We have a team of experts working with Standards bodies around the world, ensuring we have products fit for purpose, exceeding the demands of our customers.

We have identified the latest National and International Standards - those in Orange are current and those in Grey have been superseded but are still recognised in some industries.

We continuously review our products against current and new Standards. For the most up to date list of Standards, visit our online catalogue which provides the latest information on all new, current and superseded Standards which our products can be used in accordance with.



## Product Innovation

Elcometer continues to be a leader in product innovation for the Inspection Industries in both hardware and software design with a team of specialists dedicated to product development.

We are committed to continuously push the boundaries through our new product development programmes.





# 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 additional costs of rework.

Adhesion testing after the coating process will quantify the strength of the bond between substrate and coating, or between different coating layers or the cohesive strength of some substrates. Routine testing is used as part of inspection and maintenance procedures to help detect potential coating failures.

## **Pull Off Adhesion Method**

Simple to use, quantitative range giving a definitive adhesion value, ideal for the laboratory or field on flat or curved substrate applications.

Tensile Dollies (or stubs) are glued to the coating and, when the adhesive has cured, the force required to pull the coating off the surface is measured.

When selecting an adhesion gauge, it is important to use the same inspection test methods throughout the inspection to ensure accurate comparisons.

Elcometer 506

Pull-Off Adhesion Tester

**STANDARDS:**  
 ASTM D4541, ASTM D7234,  
 AS/NZS 1580.408.5, BS 1881-207,  
 DIN 1048-2, EN 12636, EN 13144,  
 EN 1348, EN 1542, EN 24624,  
 ISO 16276-1, ISO 4624, NF T30-606,  
 NF T30-062

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

new



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

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



Digital and analogue gauges available for both harsh and hazardous environments



Low height actuator allows access in restricted areas. Safety harness clip prevents accidental damage of surrounding areas during test on vertical surfaces



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

**Pull-Off Adhesion Tester**

**Elcometer 506**

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



**Powerful**

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

**Flexible**

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

new

**Accurate**

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

**Durable**

- Sealed, heavy duty and impact resistant
- Dust and waterproof equivalent to IP65
- Suitable for use in harsh environments

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

## Elcometer 506

## Pull-Off Adhesion Tester

## Testing coatings on low bond strength substrates

When testing coatings on low bond strength substrates such as concrete, wood or other fibrous materials, a larger surface area of dolly is required to improve accuracy, repeatability and reproducibility.

The Elcometer 506 Concrete Adhesion Tester can be supplied as a kit or with individual 50mm accessory items (skirt, dolly, cutter) which can be added to existing Elcometer 506 gauges.



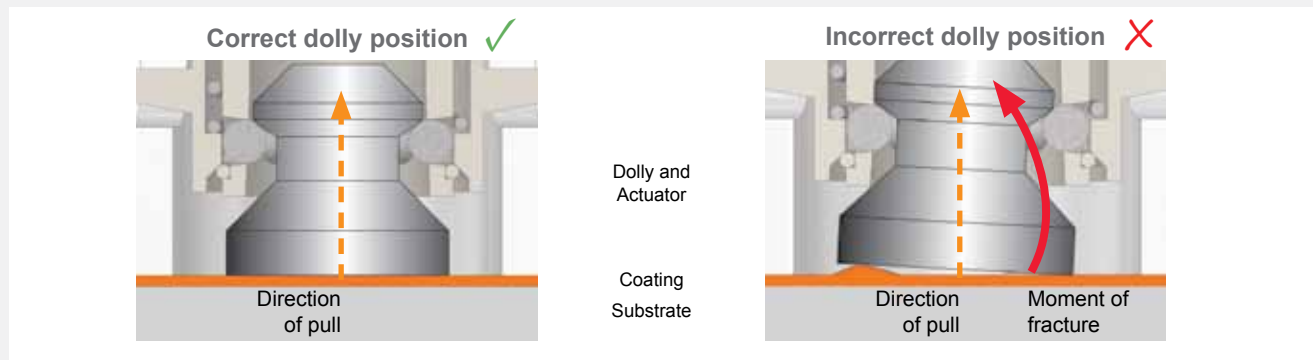
## Pull-Off Adhesion Tests - Preventing Adhesive and Cohesive Failures

## Preparing the surface and dolly

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

## Fixing the dolly

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



## Assessment of the Adhesion Test

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

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

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

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

## Pull-Off Adhesion Tester

## Elcometer 506

### Technical Specification

C

Part Number	Description	Certificate	
F506-20A	Elcometer 506 Analogue Adhesion Tester Kit; 20mm	●	
F506-20AC	Elcometer 506 Analogue Adhesion Tester Kit; 20mm - Certified	○	
F506-20D	Elcometer 506 Digital Adhesion Tester Kit; 20mm	●	
F506-20DC	Elcometer 506 Digital Adhesion Tester Kit; 20mm - Certified	○	
F506-50D	Elcometer 506 Digital Adhesion Tester Kit; 50mm	●	
F506-50DC	Elcometer 506 Digital Adhesion Tester Kit; 50mm - Certified	○	
Accuracy	±1% of full scale		
Pressure Rating	26 MPa (3800 psi)		
	<b>14.2mm (0.56") Dolly</b>	<b>20mm (0.76") Dolly</b>	<b>50mm (1.96") Dolly</b>
Operating Range	4 to 50 MPa (600 to 7200 psi)	2 to 25 MPa (300 to 3600 psi)	0.3 to 4 MPa (50 to 580 psi)
Scale Resolution	Analogue: 0.1 MPa (10 psi) Digital: 0.01 MPa (1 psi)	Analogue: 0.1 MPa (10 psi) Digital: 0.01 MPa (1 psi)	Analogue: 0.05 MPa (5 psi) Digital: 0.01 MPa (1 psi)
Instrument Length	290mm (11.5")	290mm (11.5")	290mm (11.5")
Actuator Height (skirt fitted)	85mm (3.4")	85mm (3.4")	110mm (4.3")
Instrument Weight	1.8kg (4lb)	1.8kg (4lb)	2.0kg (4.4lb)
Kit Weight	4kg (8.8lb)	4kg (8.8lb)	5.2kg (11.5lb)
Battery Type	2 x LR6 (AA) alkaline dry batteries (digital gauge only) Battery Life: 2000 hours		
Packing List:			
20mm Kit	Elcometer 506 Adhesion Tester with 20mm dollies (x10), standard skirt for 20mm dollies, 20mm dolly cutter handle, 20mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, carry case, 2 x LR6 (AA) batteries (Digital Gauge only), test certificate and operating instructions.		
50mm Kit	Elcometer 506 Adhesion Tester with 50mm dollies (x6), standard skirt for 50mm dollies, 50mm dolly cutter arbor, 50mm dolly cutter, Araldite standard two part epoxy adhesive (2 x 15ml tubes), abrasive pad, carry case, 2 x LR6 (AA) batteries (Digital Gauge only), test certificate and operating instructions.		

### Accessories

Dolly Diameter	Pack of 10 <sup>†</sup>	Pack of 100	Standard Skirt	Thin Substrate Skirt	Dolly Cutter Handle	Dolly Cutter
14.2mm (0.56")	T9990014AL-10	T9990014AL-100	T999101420S	T9990014T	T9991420H	T9990014CT
20mm (0.76")	T9990020AL-10	T9990020AL-100	T9991420S	T9990020T	T9991420H	T9990020CT
50mm (1.96")	T9990050AL-4	-	T9990050S	-	T9990050H	T9990050CT
Part Number	Description					
T99923797	Magnetic Anchor Clamp - holds actuator securely during tests on vertical surfaces					
T99912906	Araldite Standard Two Part Epoxy Adhesive, 2 x 15ml Tubes					

● Test Certificate supplied as standard.

○ Calibration Certificate supplied as standard.

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

# When using the analogue gauge with 14.2mm (0.56") dollies, multiply the 20mm dolly scale reading by 2.

## Elcometer AVU

## Adhesion Verification Unit (AVU)



The Elcometer AVU has been designed to provide users with the means to confirm the accuracy of their pull-off adhesion gauge.

Due to its robust design the Elcometer AVU is suitable for use on site or in the laboratory and allows users to verify or self-certify their pull-off adhesion gauges.

A range of dolly adaptors are available for testing the Elcometer 106 and Elcometer 506 adhesion gauges. Adaptors are also available for testing other manufacturers' gauges.

Attach the appropriate dolly adaptor to the AVU, connect your adhesion gauge, apply load and compare the adhesion tester value to the reading on the AVU Display.

Features include:

- Max hold and live reading display
- MPa / psi switchable units
- Backlit display
- Automatic switch off

The Elcometer AVU is supplied with either a test certificate or full calibration certificate, suitable for self-certification.

## Technical Specification



Part Number	Description	Certificate
T99923924	Elcometer AVU Adhesion Verification Unit	●
T99923924C	Elcometer AVU Adhesion Verification Unit - Certified	○
Range	0-30MPa (0-4000psi)	
Resolution	0.01MPa (1psi)	
Accuracy	±0.1MPa (±14.5psi)	
Battery Type	2 x 1.5V AA Cells (Alkaline)	
Gauge Dimensions	165 x 155 x 105mm (6.5 x 6.1 x 4.1")	
Gauge Weight	3kg (6.6lbs)	
Packing List	Elcometer AVU, Elcometer 506 20mm (0.76") dolly adaptor, test or calibration certificate (as appropriate), 2 x AA batteries, carry case and operating instructions	

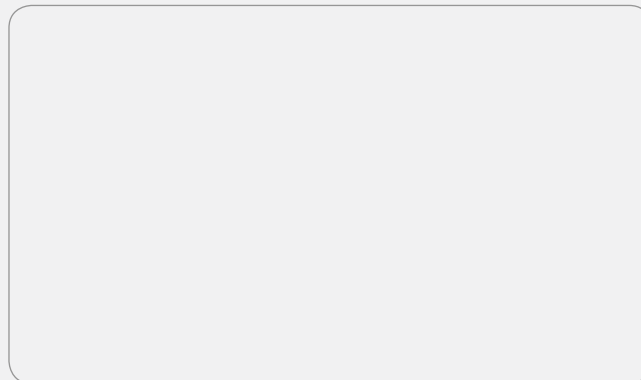
## Accessories

T99923935	Elcometer 506 Dolly Adaptor; 20 & 14.2mm (0.76 & 0.56") Skirts
T99923936	Elcometer 506 Dolly Adaptor; 50mm (2.0") Skirt
T99923937	Elcometer 106 Dolly Adaptor; Scales 1 to 4
T99923938	Elcometer 106 Dolly Adaptor; Scale 6
T99923939	AT-M & AT-A Adhesion Gauge Dolly Adaptor
T99923986	PAT Adhesion Gauge Dolly Adaptor

● Test Certificate supplied as standard.

○ Calibration Certificate supplied as standard.





elcometer®

[www.elcometer.com](http://www.elcometer.com)

**ENGLAND**

Elcometer Limited  
Manchester M43 6BU  
Tel: +44 (0)161 371 6000  
Fax: +44 (0)161 371 6010  
e-mail: [sales@elcometer.com](mailto:sales@elcometer.com)

**USA**

Elcometer Inc  
Rochester Hills Michigan 48309  
Tel: +1 248 650 0500  
Toll Free: 800 521 0635  
Fax: +1 248 650 0501  
e-mail: [inc@elcometer.com](mailto:inc@elcometer.com)

**REPUBLIC OF SINGAPORE**

Elcometer (Asia) Pte Ltd  
Singapore 589472,  
Tel: +65 6462 2822  
Fax: +65 6462 2860  
e-mail: [asia@elcometer.com](mailto:asia@elcometer.com)

**JAPAN**

Elcometer KK  
Nisso Dai 23 Building,  
Room 804, 3-8-25, Toranomon,  
Minato-ku, Tokyo 105-0001  
Tel: +81-3-6869-0770  
Fax: +81-3-6809-1442  
e-mail: [jp\\_info@elcometer.com](mailto:jp_info@elcometer.com)

**FRANCE**

Elcometer Sarl  
45430 Bou  
Tel: +33 (0)2 38 86 33 44  
Fax: +33 (0)2 38 91 37 66  
e-mail: [fr\\_info@elcometer.com](mailto:fr_info@elcometer.com)

**GERMANY**

Elcometer Instruments GmbH  
D-73431 Aalen  
Tel: +49(0)7361 52806 0  
Fax: +49(0)7361 52806 77  
e-mail: [de\\_info@elcometer.de](mailto:de_info@elcometer.de)

**BELGIUM**

Elcometer SA  
B-4681 Hermalle /s Argenteau  
Tel: +32 (0)4 379 96 10  
Fax: +32 (0)4 374 06 03  
e-mail: [be\\_info@elcometer.com](mailto:be_info@elcometer.com)

**THE NETHERLANDS**

Elcometer NL  
3584 BH Utrecht  
Tel: +31 (0)30 210.7005  
Fax: +31 (0)30 210.6666  
email: [nl\\_info@elcometer.com](mailto:nl_info@elcometer.com)

© Elcometer Limited, 2012. All rights reserved. No part of this document may be reproduced, transmitted, stored (in a retrieval system or otherwise), or translated into any language, in any form, or by any means, without the prior written permission of Elcometer Limited.

Elcometer is a registered trademark of Elcometer Limited. Due to our policy of continuous improvement, Elcometer Limited reserves the right to change specifications without notice. All gauges come with a 1 year warranty as standard, extendable within 60 days from date of purchase, free of charge, to 2 years via [www.elcometer.com](http://www.elcometer.com)