

# elcometer® **506 Pull-Off Adhesion Tester**

Can be used in accordance with :

**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**



The **Elcometer 506 Adhesion Testers** are lightweight, portable and easy-to-use adhesion gauges available in analogue or digital versions and are suitable for measuring the pull-off adhesion of coatings up to 50MPa either on-site, or in the laboratory.

The design of the **Elcometer 506 Adhesion Tester** ensures that a uniform force can be easily applied throughout the range by smoothly rotating the gauge's crank handle, ensuring repeatable results to an accuracy of  $\pm 1\%$ .

The **Elcometer 506 Adhesion Tester** quick connect coupling allows the simple attachment of 14.2mm, 20mm or 50mm diameter dollies which, together with a wide range of accessories, allows coating adhesion testing on flat, curved, thick and thin substrates - including metal, wood, concrete and other fibrous materials.

The **Elcometer 506 Adhesion Tester** test head (actuator) has been designed to be small, ergonomic and lightweight – ideal for single handed testing of coating adhesion even in awkward or confined spaces.

Safe testing on vertical surfaces has also been considered. Using the magnetic clamp accessory the actuator is held securely - preventing accidental damage to the surrounding areas.

## Features

### Powerful

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

### Flexible

- Easy to use hand-held design
- Ideal for laboratory and field use
- 14.2, 20 and 50 mm diameter reusable dollies
- Measures on small, curved and flat surfaces

### Accurate

- Measurement range up to 50 MPa 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



## Testing coatings on concrete & 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.



## Technical Specifications

| Part Number                    | Description  |  |  |  |
|--------------------------------|--|--|--|--|
| 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  |  |  |  |
| F506-50A                       | Elcometer 506 Analogue Adhesion Tester Kit; 50mm             |  |  |  |
| F506-50AC                      | Elcometer 506 Analogue Adhesion Tester Kit; 50mm - 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 Dolly</b>  | <b>20mm Dolly</b>                      | <b>50mm Dolly</b>                      |
| Operating Range                |  | 4 to 50 Mpa  | 2 to 25 Mpa                            | 0.3 to 4 Mpa                           |
| Scale Resolution               |  | Analogue: 0.2 Mpa<br>Digital: 0.01 Mpa   | Analogue: 0.1 Mpa<br>Digital: 0.01 Mpa | Analogue: 0.05 Mpa<br>Digital: 0.1 Mpa |
| Instrument Length              |  | 290mm  | 290mm                                  | 290mm                                  |
| Actuator Height (skirt fitted) |  | 85mm   | 85mm                                   | 110mm                                  |
| Instrument Weight              |  | 1.8kg  | 1.8kg                                  | 2.0kg                                  |
| Kit Weight                     |  | 4kg  | 4kg                                    | 5.2kg                                  |
| Battery Type                   |  | 2 x LR6 (AA) alkaline dry batteries (digital gauge only) Battery Life: 2000 hours              |  |  |
|                                |  | When using the analogue gauge with 14.2mm dollies, multiply the 20mm dolly scale reading by 2. |  |  |

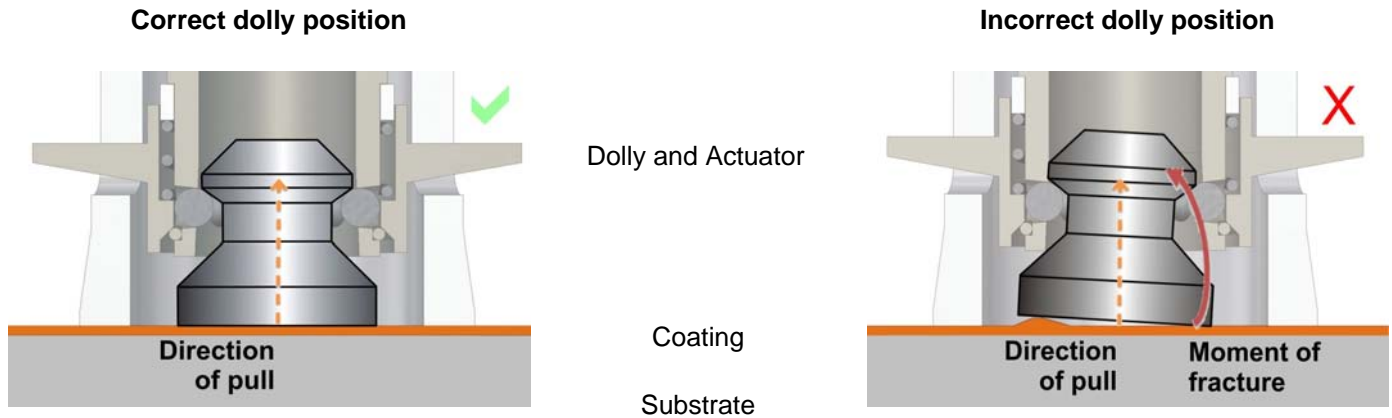
## Packing List

| 20mm Kit   | 50mm Kit                        |
|--|---------------------------------|
| Elcometer 506 Adhesion Tester                              | Elcometer 506 Adhesion Tester   |
| 20mm dollies (x10)   | 50mm dollies (x6)               |
| standard skirt for 20mm dollies                            | standard skirt for 50mm dollies |
| 20mm dolly cutter handle                                   | 50mm dolly cutter arbor         |
| 20mm dolly cutter  | 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   |                                 |
| operating instructions                                     |                                 |

## Accessories

| Dolly Diameter | Pack of 10 or 4 (50mm in 4)   | Pack of 100    | Standard Skirt | Thin Substrate Skirt | Dolly Cutter Handle | Dolly Cutter |
|----------------|---|----------------|----------------|----------------------|---------------------|--------------|
| 14.2mm         | T5060014AL-10   | T5060014AL-100 | T5061420S      | T5060014T            | T5061420H           | T5060014CT   |
| 20mm           | T5060020AL-10   | T5060020AL-100 | T5061420S      | T5060020T            | T5061420H           | T5060020CT   |
| 50mm           | T5060050AL-4  | -              | T5060050S      | -                    | T5060050H           | T5060050CT   |
| Part Number    | Description   |                |                |                      |                     |              |
| T50623797      | Magnetic Anchor Clamp - holds actuator securely during tests on vertical surfaces |                |                |                      |                     |              |
| T99912906      | Araldite Standard Two Part Epoxy Adhesive, 2 x 15ml Tubes                         |                |                |                      |                     |              |

## How to Prevent 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 above). 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.