

**Elcometer 1620**

**Cupping Tester**

**Operating Instructions**



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

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**T**hank you for purchasing this Elcometer 1620 Cupping Tester. Welcome to Elcometer.

Elcometer are world leaders in the design, manufacture and supply of inspection equipment for coatings and concrete.

Our products cover all aspects of coating inspection, from development through application to post application inspection.

The Elcometer 1620 Cupping Tester, is a world beating product. With the purchase of this product 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 TESTER**

The Elcometer 1620 Cupping Tester is a robust and simple-to-use instrument for assessing the cupping capability of coatings applied onto metal sheets up to 1.2 mm (0.05") thick.

The metal sheet is firmly clamped into a hardened steel die. Reduction gears drive a 20 mm (0.79") diameter ball (the punch) onto the underside of the metal sheet, causing the sheet to cup. The coated surface of the metal sheet is viewed and the drive mechanism is stopped when the coating begins to crack. The amount of cupping is then read from a gauge mounted on the instrument.

### **1.1 Standards**

The Elcometer 1620 can be used in accordance with the following National and International Standards

- EN13523-6, *supersedes ECCA T6*
- ISO 1520, *supersedes BS 3900-E4, DIN 53156, DIN 53232, NBN T22-104, NF T30-019.*
- JIS K 5600-5-2

### **1.2 What the box contains**

- Elcometer 1620 Cupping Tester
- Gauge
- Gauge holder (for setting zero)
- Zero setting sheet
- Illuminated magnifying glass with clamp
- Operating instructions

The Elcometer 1620 Cupping Tester is packed in a cardboard and foam package. 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 1620 please take some time to read these Operating Instructions. Do not hesitate to contact Elcometer or your Elcometer supplier if you have any questions.**

## 2 GETTING STARTED

### 2.1 The parts of your tester

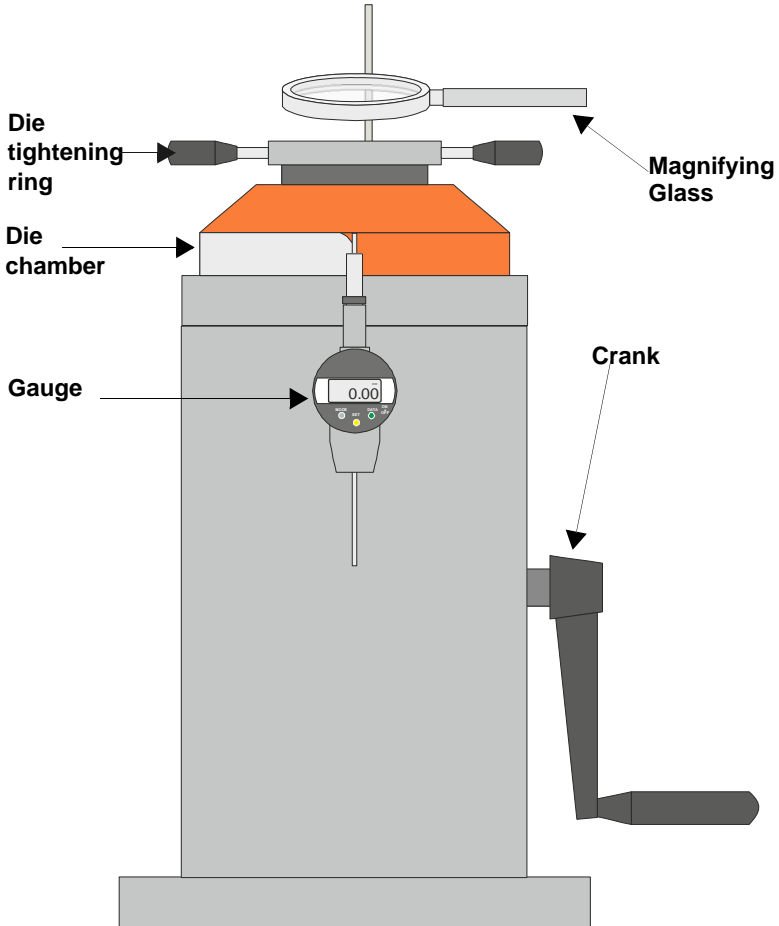


Figure 1. Parts of the tester

### 2.2 Installation

Fasten the tester onto a rigid table. Four holes are provided in the mounting flange for this purpose.

## 2.3 Digital gauge

The Elcometer 1620 is fitted with a digital gauge.

To switch the gauge on, press the ON/OFF button. Press and hold to switch off. After changing the battery the gauge will need to be zeroed. To zero the gauge, see “Zeroing the gauge” on page 7. The battery is located under the battery compartment cover; use a small screwdriver to remove the cover.

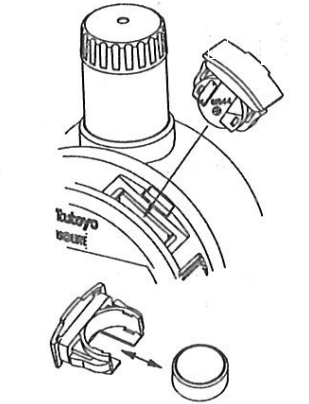


Figure 2. Battery Holder

## 3 TESTING A SPECIMEN

### 3.1 Procedure

1. Unscrew the die tightening ring until there is sufficient clearance between the halves of the die as observed in the die chamber.
2. Ensure the top of the punch is below the top of the die, see Figure 4 on page 7.

3. Place the sample to be tested in the die chamber and screw down the die tightening ring until the sheet is clamped firmly (see Figure 3).



**Figure 3. Metal sheet clamped in the die and ready for cupping test**

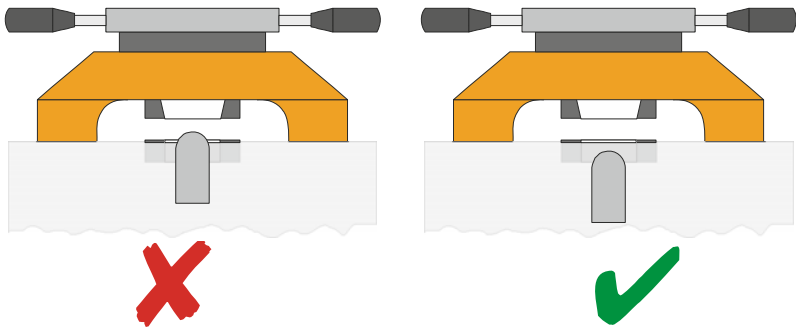
4. Rotate the handle at a constant speed of 1 revolution per second to raise the punch.
5. While the punch is moving upwards, use the illuminated magnifying glass to observe the sample through the aperture in the top of the die tightening ring.  
As soon as cracks appear in the paint, stop the punch and record the cupping reading on the gauge.
6. Rotate the handle to lower the punch below the level of the die.
7. Unscrew the die tightening ring and remove the sample.



## 4 ZEROING THE GAUGE

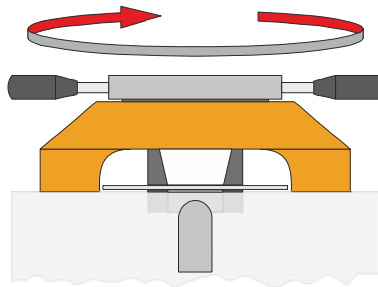
The tester is supplied from the Elcometer factory correctly set to zero and ready to use. If the gauge is removed, reset or the battery changed it must then be set to zero using the following procedure.

1. Unscrew the die tightening ring until there is sufficient clearance between the halves of the die as observed in the die chamber.
2. Ensure the punch is below the level of the top of the die (see Figure 4).



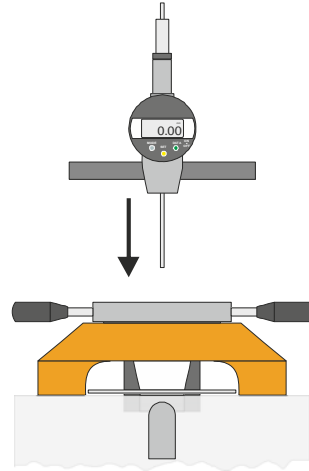
**Figure 4. Set punch below top of die**

3. Place setting sheet in die chamber and screw down die tightening ring until setting sheet is clamped firmly (see Figure 5).



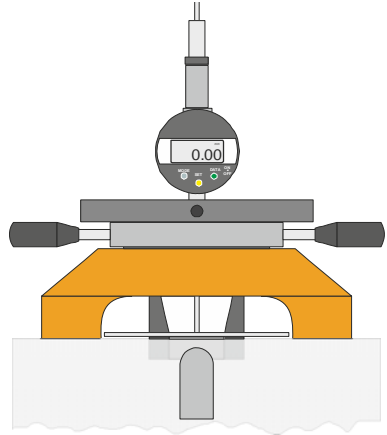
**Figure 5. Clamping the setting sheet**

4. Remove the gauge from the tester (unscrew the clamping screw), place the gauge into the gauge holder and tighten the retaining screw gently (see Figure 6).



**Figure 6.**

5. Place the gauge and holder into the aperture of the die tightening ring; the gauge sensor should touch the setting sheet (see Figure 7).
6. Switch on the gauge (press ON/OFF ).



**Figure 7.**

7. If 'INC' is displayed on the gauge it is in 'relative' mode and should be changed to 'absolute' mode by pressing and holding SET until 'INC' is no longer displayed.

8. Press SET.

The display will show the previously set preset value and a flashing 'P'.

If the display shows '+0000.00' press set to zero the display.

If the display shows a preset value that is not zero refer to the Mitutoyo instructions supplied with the gauge to set the preset value to zero.



9. Rotate the handle slowly to raise the punch until the gauge reads 0.01.

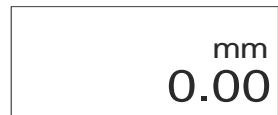
10. Leave the handle in this position, remove the gauge from the holder and replace in the tester clamp, tightening the retaining screw gently.

*Note : It is important the handle does not move during this operation.*

11. Press SET, to show the preset value.



12. Press SET to zero the display. Remove the setting sheet. The gauge is now correctly set and ready to use.



## 5 MAINTENANCE

The Elcometer 1620 Cupping Tester is designed to give many years reliable service under normal operating and storage conditions.

To prevent the formation of rust, rub the dies, the punch and the die tightening ring with a lightly oiled cloth. This procedure should be carried out every six months, or sooner if the tester is used intensively.

Once a year, grease the threads of the die tightening ring and the sides of the punch with oil, Molykote™ grease, or equivalent.

The tester does not contain any internal user-serviceable components. In the unlikely event of a fault, the Elcometer 1620 should be returned to your local Elcometer supplier or directly to Elcometer. The warranty will be invalidated if the gauge has been opened.

Details of Elcometer offices around the world are given on the outside cover of these operating instructions. Alternatively visit the Elcometer website, [www.elcometer.com](http://www.elcometer.com)

## 6 TECHNICAL SPECIFICATION

Maximum width of sample sheet:	100 mm (4")
Maximum thickness of sample sheet:	1.2 mm (0.05")
Gauge Battery:	1.5 V, SR44 or equivalent
Magnifier Battery:	1.5 V, 2 x AA
Dimensions:	300 mm x 240 mm x 500 mm (12" x 10" x 20")
Weight:	24 kg (53 lb)

## 7 RELATED EQUIPMENT

In addition to the Elcometer 1620 Cupping Tester, Elcometer produces a wide range of other equipment for determining the physical characteristics of surface coatings.

Users of the Elcometer 1620 may also benefit from the following Elcometer products:

- Elcometer 1510 Conical Mandrel Bend Tester
- Elcometer 1506 Cylindrical Mandrel Bend Tester
- Elcometer 1615 Variable Impact Tester
- Elcometer 1542 Cross Cut Adhesion Tester

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