elcometer 107 Cross Hatch Adhesion Tester User Guide

User Guide (en)
Elcometer 107
Cross-Hatch Adhesion Tester

[redacted] For the avoidance of doubt, please refer to the original English language version.
Gauge Dimensions: 165 x 30 x 45mm (6.5 x 1.2 x 1.8″)
Gauge Weight: 370g (13oz)
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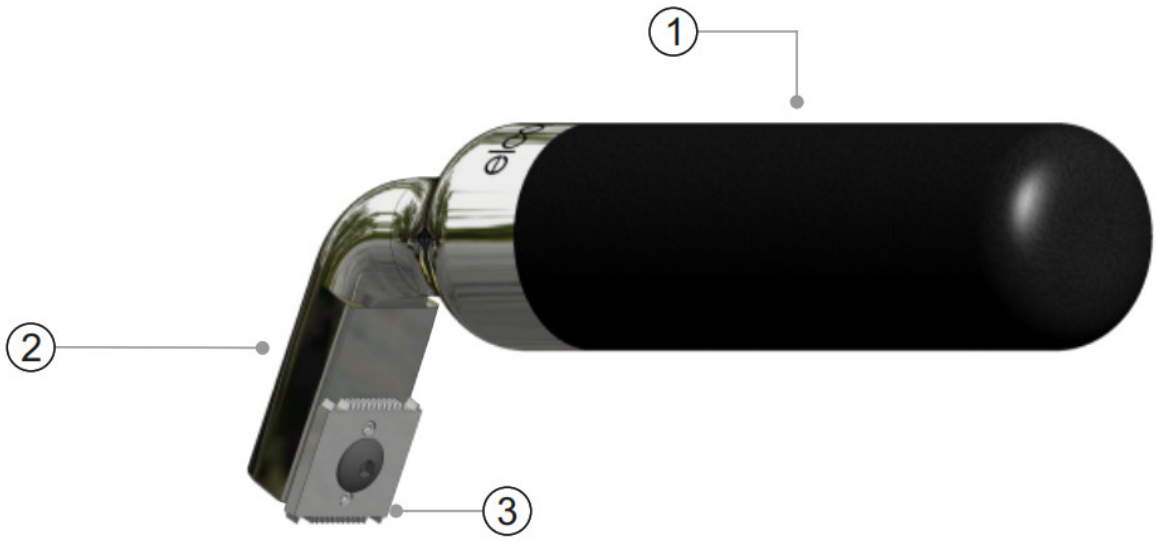
Contents

GAUGE OVERVIEW



1. Cross-Hatch Cutter Handle
2. Cutter Head
3. Cutter Blade

BOX CONTENTS

Elcometer 107 Basic Kit contents:

- Elcometer 107 Cross Hatch Adhesion Tester
- Cross-Hatch Cutter; 6 x 1mm, 6 x 2mm, 6 x 3mm, 11 x 1mm or 11 x 1.5mm
- Hexagonal Wrench; 2.5mm
- Transit Case

- Calibration Certificate (if ordered)
- User Guide

Elcometer 107 Full Kit contents: All items listed in the Elcometer 107 Basic Kit contents, plus:

- Adhesive Tape; ISO or ASTM (1 roll)
- Cross-Hatch Brush
- Magnifier; x6

GETTING STARTED

SELECTING THE CORRECT CUTTER BLADE

The cutter blade is selected based on the substrate type, coating thickness, and the test method being used, see table below.

Coating Thickness		**Test Method**		
pm	mils	ASTM (Metal Substrates)	ISO/JIS (Hard Substrates)	ISO/JIS (Soft Substrates)
0-50	0 – 2	11 x 1mm		
50 – 125	2 – 5	6 x 2mm	–	–
0-60	–	–	6 x 1mm	6 x 2mm
61 – 120	–	–	6 x 2mm	6 x 2mm
121 – 250	–	–	6 x 3mm	6 x 3mm

FITTING THE CROSS HATCH CUTTER BLADE

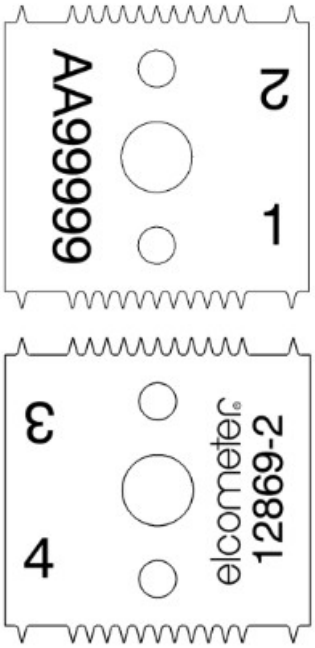
The Elcometer 107 is supplied with a cutter blade. Different sizes of cutting blades are available, see Section 6.1 ‘Cross Hatch Cutter Blades’ on page en-8, all of which fit the adhesion tester.

To fit a cutter:

1. Use the hexagonal wrench supplied to remove the cutter securing screw by turning anti-clockwise.
2. Remove the existing cutter (if fitted) and position the new cutter.
3. Re-position and tighten the cutter securing screw.

CHANGING THE CUTTING EDGE

Each cross hatch cutter blade has a total of 4 cutting edges, labeled 1 to 4. When a cutting edge becomes worn, simply rotate the cutting blade by 180° to use the next cutting edge on that side. Repeat until both cutting edges are worn.
Remove the cutting blade, turn over, and re-fit (see Section 3.2), to use the cutting edges on the other side.



Note: The ISO/JIS Standard recommends that the cutting tool is replaced when the top of the blades has flattened to 0.1mm.

TEST PROCEDURE

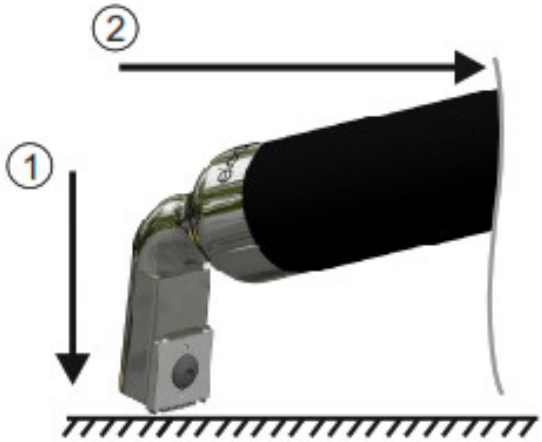
The Elcometer 107 can be used in accordance with ISO/JIS and
ASTM Standards. The test procedure is dependent on the standard being used.

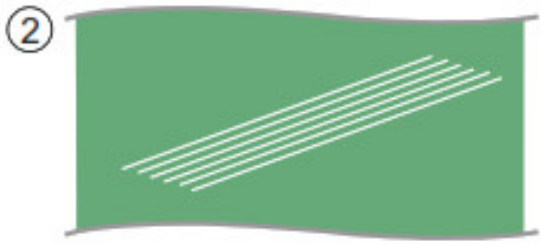
BEFORE YOU START

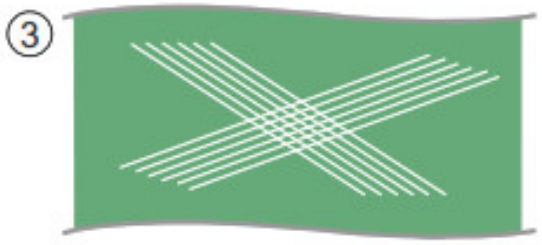
1. Select and fit the appropriate cutter blade for the test method – see Sections 3.1 & 3.2 on page en-3.
2. Select the correct adhesive tape – see Section 6.2 on page en-9.

TEST PROCEDURE: ISO/JIS

1. Place the cutting edge on the sample.
2. Press down gently and pull the adhesion tester towards you in one steady movement to make a series of parallel cuts approximately 20mm long. Apply sufficient pressure to ensure you cut right through the coating to the surface of the substrate. 4 If the substrate is wood or similar, make cuts at a 45° angle to the direction of the grain.
3. Place the cutting edge on the sample at a 90° angle to the first cut and repeat Step 2 to create a lattice pattern on the coating.







4. Brush the sample lightly several times, forward and backward along the diagonals of the lattice, to remove debris.

   A brush is supplied as standard with the Elcometer 07 Full Kit and can also be 1 purchased as an optional accessory, see Section ‘Miscellaneous Spares & 6.3 Accessories’ on page en-9.

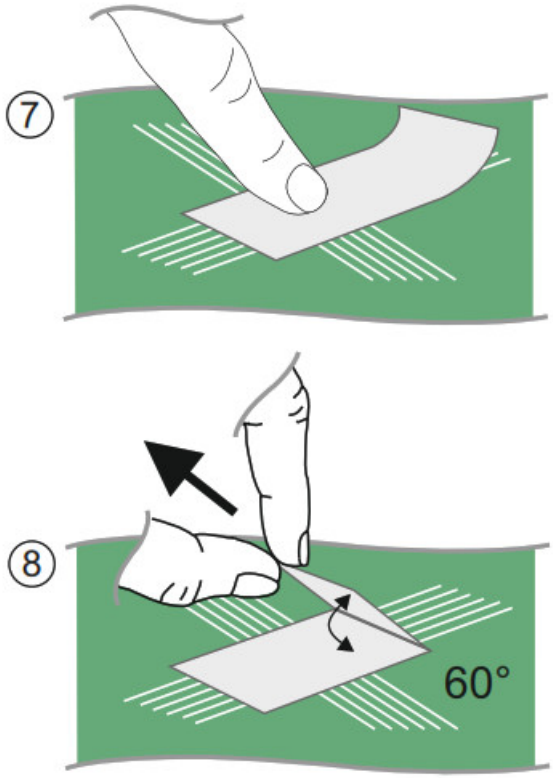
5. Inspect the sample to ensure that the cuts have penetrated all the way through the coating.

   TEST PROCEDURE (continued)

   If the substrate is soft, jump to Step 10. If the substrate is hard or wood, proceed to Step 6.

6. Remove and discard two complete turns of adhesive tape. Remove an additional length of tape at a steady rate and cut a piece approximately 75mm from this length.
7. Center the cut piece of tape over the lattice and smooth it into place using a finger. Rub the tape firmly using a

fingernail or fingertip to ensure good adhesion between the tape and the coating.



8. Within 5 minutes of applying the tape, remove the tape by pulling in a single smooth action taking approximately 0.5 to 1 second at an angle of 60° to the surface.
9. To maintain a permanent record of the test, retain the tape by applying it to a transparent film. 7 8 60°
10. Assess the coating adhesion by viewing the lattice of cuts in good light. If agreed, use an eyeglass to aid viewing. Compare the lattice of cuts with the ISO/JIS standards table shown in Section 5 ‘Assessing the Results’ on page en-7. 4

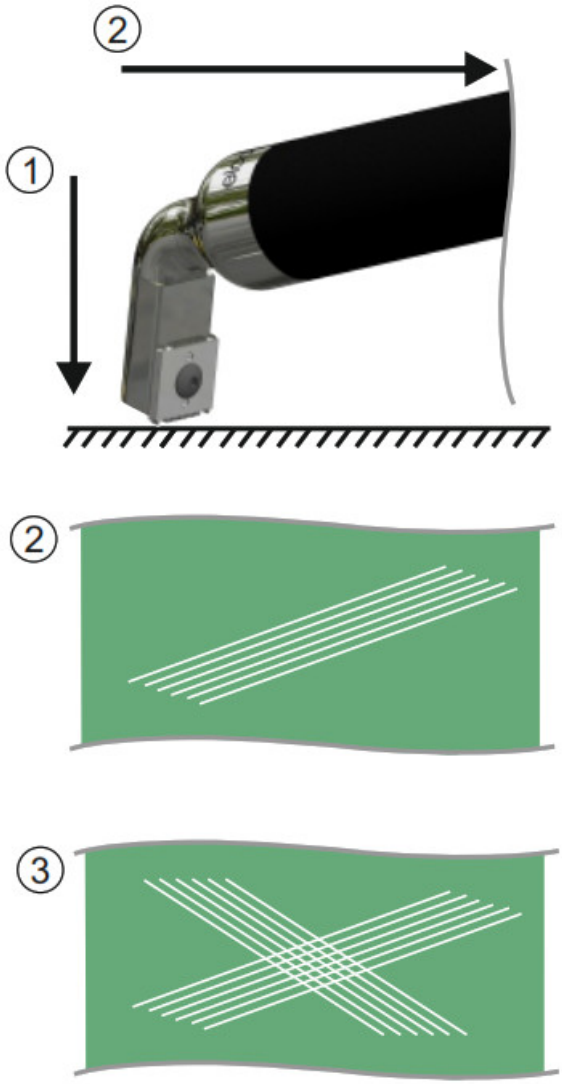
    A magnifier is supplied as standard with the Elcometer 107 Full Kit and can also be purchased as an optional accessory, see Section 6.3 ‘Miscellaneous Spares & Accessories’ on page en-9.

Note: Consult the relevant Standard for full details of the test method.

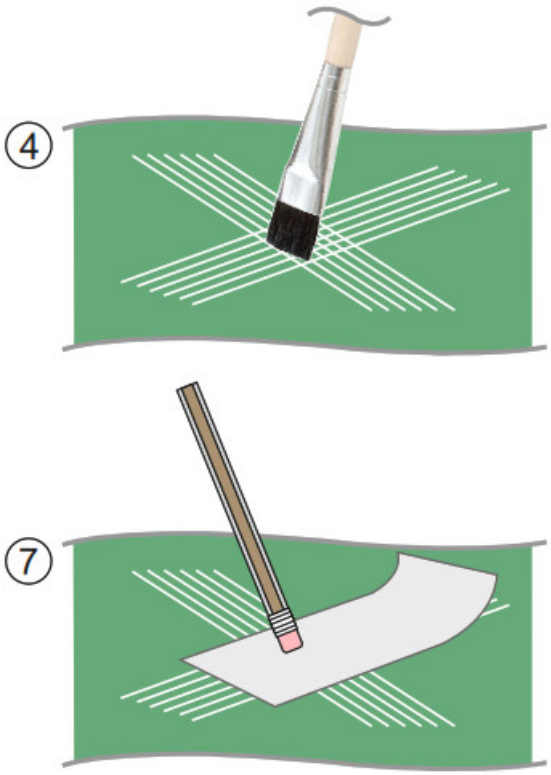
TEST PROCEDURE (continued)

TEST PROCEDURE: ASTM

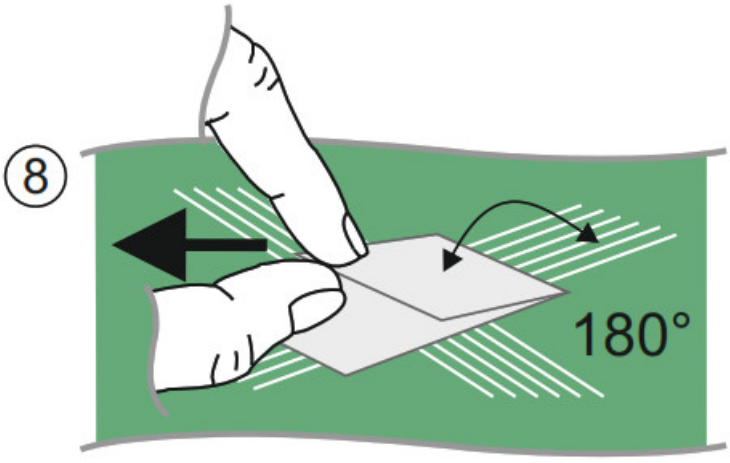
1. Place the cutting edge on the sample.
2. Press down gently and pull the adhesion tester towards you in one steady movement to make a series of parallel cuts approximately 20mm long. Apply sufficient pressure to ensure you cut right through the coating to the surface of the substrate.



3. Place the cutting edge on the sample at a 90° angle to the first cut and repeat Step 2 to create a lattice pattern on the coating.
4. Brush the sample lightly to remove detached flakes or ribbons of coating. 4 A brush is supplied as standard with the Elcometer 107 Full Kit and can also be purchased as an optional accessory, see Section ‘Miscellaneous Spares & 6.3 Accessories’ on page en- .9



5. Inspect the sample to ensure that the cuts have penetrated all the way through the coating.
6. Remove and discard two complete turns of adhesive tape. Remove an additional length of tape at a steady rate and cut a piece approximately 75mm from this length.
7. Centre the cut piece of tape over the lattice and smooth into place using a finger. Rub the tape firmly using an eraser on the end of a pencil to ensure good adhesion between the tape and the coating.
8. Within 90 seconds (±30 seconds) of applying the tape, remove the tape by pulling in a single smooth action at an angle of 180° to the coating surface.

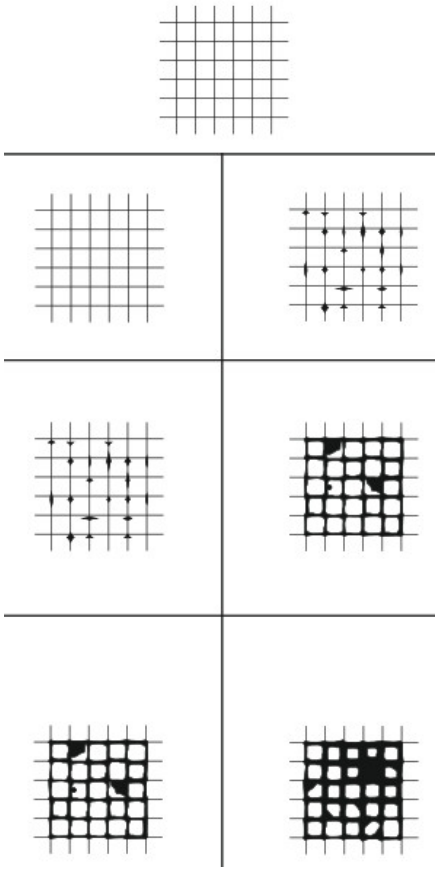


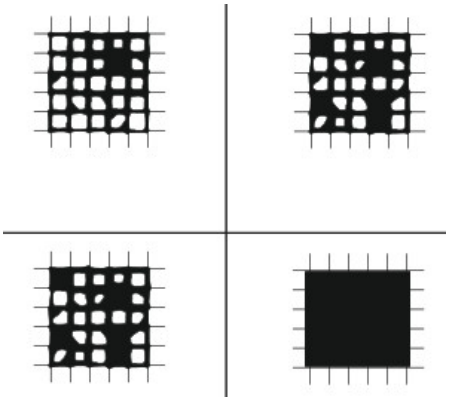
9. Assess the coating adhesion by viewing the lattice of cuts using an illuminated magnifier. Compare the lattice of cuts with the ASTM standards table shown in Section 5 ‘Assessing the Results’ on page en-7.

Note: Consult the relevant Standard for full details of the test method.

ASSESSING THE RESULTS

The ISO/JIS and ASTM classifications are reproduced in the table below however, we recommend obtaining a copy of the latest version of these Standards.

Example Appearance		Description	Classification	
Minimum Removal	Maximum Removal		ISO/JIS	ASTM
		The edges of the cuts are completely smooth; none of the squares of the lattice is detached.	0	5B
		Detachment of flakes of the coating at the intersections of the cuts. A cross-cut area not greater than 5% is affected.	1	4B
		The coating has flaked along the edges and/or at the intersections of the cuts. A cross-cut area greater than 5%, but not greater than 15% is affected.	2	3B
		The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and/or it has flaked partly or wholly on different parts of the squares. A cross-cut area greater than 15 %, but not greater than 35%, is affected.	3	2B

Example Appearance		Description	Classification	
Minimum Removal	Maximum Removal		ISO/JIS	ASTM
		The coating has flaked along the edges of the cuts in large ribbons and/or some squares have detached partly or wholly. A cross-cut area greater than 35%, but not greater than 65%, is affected.	4	1B
		Any degree of flaking that cannot be classified even by classification 4 or 1B	5	OB

SPARES & ACCESSORIES

CUTTER BLADES

The Elcometer 107 is supplied complete with a cutter blade. Various cutting blades are available for different substrate types and coating thicknesses, for use in accordance with different test methods and International Standards.
Cutter blades are interchangeable and are available with or without a calibration certificate.

Cutter Blade	Suitable for Test Method			Part Number	
	ISO/JI	ASTM	AS	Uncertified	Certified
6 x 1mm	√	√		T99913700-1	T99913700-1C
6 x 2mm	√	√	√	T99913700-4	T99913700-4C
6 x 3mm	√			T99913700-5	T99913700-5C
11 x 1mm			√	T99913700-2	T99913700-2C
11 x 1.5mm	√			T99913700-3	T99913700-3C

ADHESIVE TAPE

Elcometer 107 Full Kits are supplied with one roll of tape. Tape is not supplied with basic kits.
Tape suitable for use with ISO/JIS and ASTM test methods is available to purchase as a single roll or two roll pack, using the part numbers below.

	Suitable for Test est Method		Part Number	
	ISO/JIS	ASTM	1 Roll	2 Rolls
Adhesive Tape	✓		T9999358-1	T9999358-2
Adhesive Tape		✓	K0001539M001	T9998894-

MISCELLANEOUS SPARES & ACCESSORIES

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

Description	Part Number
Cross-Hatch Brusha	T99913357
Magnifier (x6)	T10713356

WARRANTY STATEMENT

The Elcometer 107 Cross Hatch Adhesion Tester is supplied with a one year warranty against manufacturing defects, excluding contamination and wear.
Cutter blades are supplied with a three-month warranty against manufacturing defects, excluding contamination and wear.

TECHNICAL SPECIFICATION

Cutter Blade	6 x 1mm	6 x 2mm	6 x 3mm	11 x 1mm	11 x 1.5mm
Coating Thickness Range	0-60pm (0-2.4mils)	50-125pm (2-5mils)	121-250pm (4.8-9.8mils)	0-50pm (0-2mils)	
Gauge Dimensions	165 x 30 x 45mm (6.5 x 1.2 x 1.8″)				
Gauge Weight	370g (13oz)				

Can be used in accordance with:
AS 3894.9, AS 1580.408.4, ASTM D 3359-B, BS-3900-E6, ECCA T6, EN 13523-6, ISO 2409, ISO 16276-2, JIS K 5600-5-6, NF T30-038
www.elcometer.com

Documents / Resources

	**elcometer 107 Cross Hatch Adhesion Tester** [pdf] User Guide 107, Cross Hatch Adhesion Tester, 107 Cross Hatch Adhesion Tester, Adhesion Tester, Tester