

**Elcometer
2020 / 2041 / 2050 / 2070**

Fineness of Grind Gauge

Operating Instructions

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Thank you for your purchase of this Elcometer Fineness of Grind Gauge. 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 Fineness of Grind Gauges, are world beating products. 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

1 ABOUT YOUR GAUGE

The Elcometer Fineness of Grind Gauges are precision gauges used to determine particle size and fineness of grind. The gauges are suitable for measurement of many materials, including: paints, pigments, inks, printing inks, coatings, chocolates and other similar products. The gauges may also be used to indicate the presence of undesirable large particles in these materials.

A scraper is used to pull the material along a sloping groove machined into the top surface of the gauge. Fineness of grind is read directly from a scale engraved into the gauge.

ELCOMETER 2041: The Basic Gauge. This model has two grooves and graduations marked in microns or mils on the side of the gauge. Accuracy $\pm 2 \mu\text{m}$.

ELCOMETER 2020: The Standard Gauge. This model has two grooves and graduations marked in microns or mils, NS^a and PCU^a on the top of the gauge. Accuracy $\pm 2 \mu\text{m}$.

a. NS - Hegman, PCU - North

ELCOMETER 2050: A High Precision Gauge. This model has one groove and graduations marked in microns or mils on the top of the gauge. Accuracy $\pm 1 \mu\text{m}$.

ELCOMETER 2070: NPIRI^b Fineness of Grind Gauge. This model has two grooves and graduations in microns or mils and NPIRI on the top of the gauge. Accuracy $\pm 1 \mu\text{m}$.

1.1 STANDARDS

The Elcometer Fineness of Grind Gauges can be used in accordance with the following National and International Standards (depending upon the model):

AS/NZS 1580.204.1

ASTM D 1210

ASTM D 1316 (model 2070 only)

FTMS 141 4411.1

ISO 1524, *supersedes DIN 53203, EN 21524, NF T30-045.*

JIS K 5600-2-5 (models 2020, 2041 and 2050 only)

1.2 WHAT THE BOX CONTAINS

- Elcometer Fineness of Grind Gauge model 2020, 2041, 2050 or 2070
- Scraper
- Plastic Case
- Operating instructions

b. National Printing Ink Research Institute

The Elcometer Fineness of Grind Gauge 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.

1.3 CAUTION

When using the gauge, take care not to damage the top surface of the gauge or the edges of the scraper.

2 TAKING A READING

2.1 BEFORE YOU START

- Ensure the surface of gauge and edge of the scraper are clean from material residue, oil, etc.
- Perform a preliminary test to determine the size of gauge most suitable for the fineness of grind characteristics of the material being tested.

2.2 PROCEDURE

1. Place the gauge on a flat, horizontal and non-slip surface, with the zero mark on the scale closest to the user.
2. Place a suitable amount of the material in the deep end of each groove.
3. Place the scraper on the surface of the gauge behind the material. Use both hands to hold the scraper (Figure 1).
4. Pull the scraper along the length of the gauge at a constant speed^c. Stop at a point beyond the zero depth.

This operation should take approximately 1 to 2 seconds.

5. View the drawn out material within the next 3 seconds. This avoids inaccurate testing due to evaporation of the material.

The material should be viewed at right angles to the length of the groove and at an angle of 20° to 30° with the surface of the gauge.

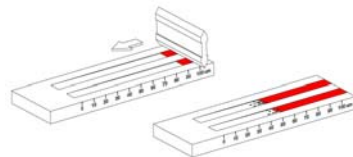


Figure 1. Pull scraper along the gauge

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- c. Apply sufficient downward pressure to clean excess material from the edges of the gauge. Avoid the formation of air bubbles.

6. **Elcometer 2020, 2041 and 2050:** Find a band across the groove(s) 3 mm (1/8") wide which contains 5 to 10 particles of the material (Figure 2).

Read the position of the upper limit of this band on the scale and record this value.

Elcometer 2070: Find the first position in the material where a given number^d of scratches can be seen. Read the scale and record this value.

7. Use a suitable solvent to clean the gauge and scraper.
8. Perform two more tests and calculate the average value of the results.

The average value is the fineness of grind of the material.

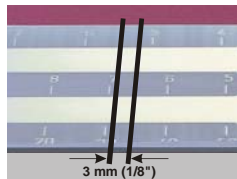


Figure 2. Reading the gauge - Elcometer 2020, 2041 and 2050

2.3 AFTER THE TEST

Always clean the gauge thoroughly after a test.

- X** Do not use wire brushes, metal scrapers, metal files or other metallic tools for cleaning.
- ✓** Clean the gauge using a suitable solvent only.

After cleaning, ensure that all materials are removed and that the instrument is dry.

- d. A recommended method is to record 2 values: Position one - where there are 3 scratches, and Position two - where there are 10 scratches.

Store the gauge in the case provided.

3 STORAGE

When the gauge is not being used it must be protected from rust.

Rust can appear on the gauge when it is only used occasionally and when it has been handled by users with sweaty hands.

To protect against rust, always dry the gauge after use and apply a thin layer of oil to the surface of the gauge and scraper before storage.

Elcometer recommends the use of an oil which does not harden during drying such as Castrol Rustilo DW 378.

Always store the gauge in its case.

4 MAINTENANCE

The Elcometer Fineness of Grind Gauges are designed to give many years reliable service under normal operating and storage conditions.

Regular calibration checks over the life of the gauge are a requirement of quality management procedures e.g. ISO 9000 and other standards. For checks and certification contact Elcometer or your local Elcometer supplier.

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

4.1 GAUGE INSPECTION

Check regularly whether the gauge is worn. To check for wear, use an Elcometer 2060 ISO Groove Depth Checker - see “Related equipment” on page 10.

If wear is detected, contact Elcometer or your local supplier.

4.2 SCRAPER INSPECTION

Periodically check the scraper for signs of wear or damage.

Place the edge of the scraper on a reference plane (the smooth, level face of the gauge is a good alternative).

Shine a bright light towards the back of the scraper. Rock the scraper backwards and forwards and inspect the contact edge for any light coming through between the scraper and gauge (Figure 3).

If light is visible, the scraper is not suitable for use and should be replaced - see “Spares” on page 10.



Figure 3. Visual inspection of scraper

5 TECHNICAL SPECIFICATION

ACCURACY

Models 2020 and 2041:	$\pm 2 \mu\text{m}$ (0.08 mils)
Model 2050:	$\pm 1 \mu\text{m}$ (0.04 mils)
Model 2070:	$\pm 2 \mu\text{m}$ (0.08 mils)

GROOVE LENGTH

Models 2020 and 2041:	127 mm (5")
Model 2050:	200 mm (7.87")
Model 2070:	165 mm (6.5")

GROOVE WIDTH

Models 2020 and 2041:	12 mm (0.47")
Model 2050:	12 mm (0.47")
Model 2070:	25 mm (0.98")

MATERIALS

The gauge and its scraper are made of hardened stainless steel.

6 SPARES

The following replacement and optional items are available from your local supplier or direct from Elcometer:

REPLACEMENT SCRAPERS

For model 2020: KT002020N001

For model 2041: KT002030N001

For model 2050: KT002030N001

For model 2070: KT002070N001

CALIBRATION CERTIFICATE

A calibration certificate is available upon request.

7 RELATED EQUIPMENT

In addition to the Fineness of Grind Gauges, Elcometer produces a wide range of other equipment for measuring the physical characteristics of surface coatings.

Users of the Elcometer Fineness of Grind Gauges may also benefit from the following Elcometer products:

- Elcometer 2000 Muller Laboratory Grinder
- Elcometer 2060 ISO Groove Depth Checker
- Elcometer Viscosity Cups and Rotational Viscometers

For further information contact Elcometer, your local supplier, or visit our website at www.elcometer.com

8 ELCOMETER FINENESS OF GRIND GAUGES

Elcometer Model Number	Range				Graduation		Part number	
	µm	mils	Hegman (NS)	North (PCU)	µm	mils	Metric	Imperial
2041/1	0-15	-	-	-	1	-	K0002041M001	-
2041/2	0-25	0-1	-	-	2.5	0.1	K0002041M002	K0US2041M002
2041/3	0-50	0-2	-	-	5	0.2	K0002041M003	K0US2041M003
2041/4	0-100	0-4	-	-	10	0.5	K0002041M004	K0US2041M004
2020/3	0-15	-	8-7	10-9	1	-	K0002020M003	-
2020/4	0-25	0-1	8-6	10-8	2.5	0.1	K0002020M004	K0US2020M004
2020/1	0-50	0-2	8-4	10-5	5	0.2	K0002020M001	K0US2020M001
2020/2	0-100	0-4	8-0	10-0	10	0.5	K0002020M002	K0US2020M002
2050/1	0-25	0-1	-	1	0.05	-	K0002050M001	K0US2050M001
2050/2	0-50	0-2	-	2	0.1	-	K0002050M002	K0US2050M002
2050/5	0-100	0-4	-	5	0.2	-	K0002050M005	K0US2050M005
2050/8	0-250	0-9	-	12.5	0.5	-	K0002050M008	K0US2050M008
2070/1	0-25	0-1	0-10	2.5	0.1	1	K0002070M001	K0US2070M001