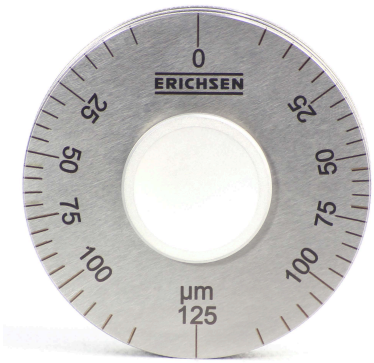
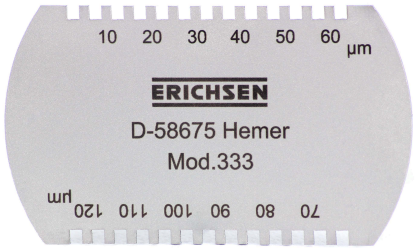
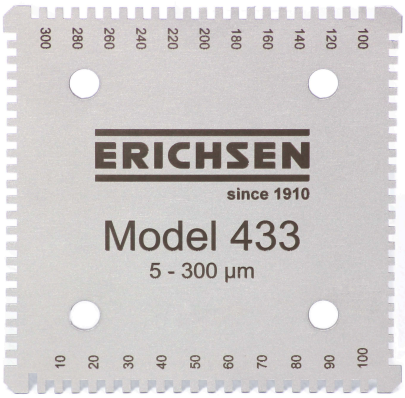


Mechanical
Wet Film
Thickness Gauges
Models 234/333/433





Mechanical Film Thickness Gauges

for Coating Plants

and Laboratories

testing equipment for quality management

ERICHSEN
since 1910

Technical Description and Operating Instructions

General

Film thickness measurement plays an essential part in the use and testing of paints and coating materials. The film thickness is a decisive factor in determining appearance, protective qualities and durability.

A film which is too thin will afford inadequate protection and reduced hiding power. For this reason, technical specifications stipulate minimum film thicknesses and regular controls must be carried out to ensure that these values are consistent.

On the other hand, an excessively thick film is the result of using too much coating material, causing costs to increase accordingly. Furthermore, thicker coatings do not always mean an improvement in properties: for example, they have an adverse affect on drying time.

The physical and mechanical properties of a coating are directly dependent on the film thickness. If meaningful testing is to be conducted, the film thickness must therefore be uniform.

Wet film thickness gauges are used to check freshly applied coatings and can also be used to calculate the resulting dry film thickness. If deviations from the specified value are detected, corrective measures can be taken immediately.

Mechanical film thickness gauges provide a number of advantages:

- Handy, portable, and simple to operate, even by unskilled personnel.
  Sturdy construction, direct reading.
- Measurements can be carried out on any surface. Since the system functions completely mechanically, substrates of glass, wood, metal or plastic are permissible.
- In comparison to other systems, mechanical film thickness gauges are favourably priced.

All versions of Model 234 R are supplied with a Manufacturer's Certificate M in accordance with DIN 55 350-18 that includes among others the following information:

Setting and actual values for the gap heights related to the scale values, product indentification, test equipments used with calibration status, date, name of inspector.

The gap heights are measured by means of a digital dial gauge at 6 spots evenly spread over the measuring area and compared with the setting values read on the scale..





Profile view

Wet Film Thickness Gauge, Model 234
in accordance with ISO 2808, ASTM D1212, BS 3900 : C5

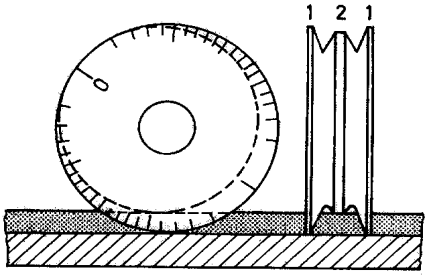


Fig. 1

Application

On all flat or uniformly curved (concave and convex) surfaces.

Test Principle

The disc-shaped measuring instrument (Fig. 1) is rolled over the wet film. During this process two knurled, concentric rims (1) roll across the substrate whilst an excentrically positioned measuring rib (2) picks up coating material as soon as the distance of the rib from the rims is equivalent to the wet film thickness to be measured.

Design and Function

The hardened, precision-ground measuring disc of stainless steel is 50 mm in diameter and 11 mm thick. It features a freely rotating aluminium guide roller to enable the instrument to be rolled over the surface.
Available in 8 different versions and measurement ranges (see order information).
The read-out scale is engraved on one side around the periphery of the disc. Each instrument is supplied in a case.

Measuring Procedure

Measurement 1:
Grip the guide roller of the instrument between thumb and index finger and place on test surface so that contact is made on the side directly opposite the zero mark. Apply light pressure, roll instrument towards the zero mark and lift off.

Measurement 2: (cross check)
The instrument is positioned as instructed for measurement 1, but rolled in the opposite direction until it reaches the zero mark.
Read off wet film thickness from the scale at the point where wet film marking commences, compare with the opposite side and establish mean value.

Order Information

Order No.	Model	Measuring range	Read-off accuracy
00710131	234 R/I	0 - 25 µm	1 µm
00710231	234 R/II	0 - 50 µm	2 µm
00710331	234 R/III	0 - 125 µm	5 µm
00710431	234 R/IV	0 - 250 µm	10 µm
00710531	234 R/V	0 - 500 µm	20 µm
00710631	234 R/VI	500 - 1000 µm	20 µm
00710731	234 R/VII	0 - 1000 µm	50 µm
00710831	234 R/VIII	0 - 1500 µm	50 µm

Wet Film Thickness Gauge, Model 333 acc. to Rossmann in accordance with ISO 2808, BS 3900 : C5

Application

On all flat and slightly curved surfaces, as long as the measuring instrument can be applied parallel to the axis of curvature.

Test Principle

The equally long teeth 1 and 12 of the comb-shaped measuring instrument (Fig. 2) penetrate the wet film to the substrate. Between these two end positions teeth 2 to 11 are formed at a progressively increasing distance from the substrate. Teeth 6 to 11 dip into the coating whilst teeth 2 to 5 do not touch the material. The measuring result is the mean value between tooth 5 and tooth 6.

Designs and Function

The teeth on two sides of a rectangular measuring instrument made of polished stainless steel plate are cut to achieve a progressively decreasing distance from the substrate. Engraved figures indicate the distance in µm from the base material.
Available in three different ranges (see order information).
The instrument is supplied in a synthetic leather pocket.

Measuring Procedure

The measuring blade with the assumed range of wet film thickness is placed on the test surface and held perpendicular. Applying slight pressure, a short "combing" movement is effected. The instrument is then lifted off vertically.

The wet film thickness is shown on the scale where the first tooth shows traces of coating material.

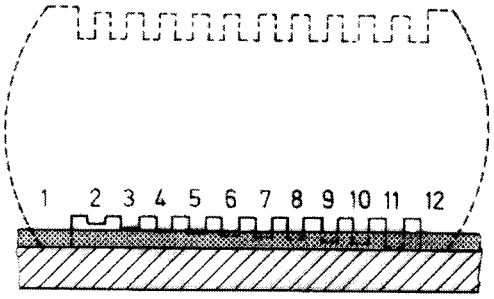


Fig. 2

Order Information			
Order No.	**Model**	**Measuring range**	**Read-off accuracy**
00910131	333 I	0 - 120 µm	5 µm
00910231	333 II	0 - 600 µm	25 µm
00910331	333 III	0 - 1200 µm	50 µm



Wet Film Thickness Gauge, Model 433 in accordance with ISO 2808, BS 3900 : C5

Application

This easy-to-use comb-type measuring instrument can be used on any substrate.

Test Principle

Comparable with Model 333.

Design and function

Teeth are cut into all sides of a square stainless steel measuring blade at a progressively increasing distance from the substrate. Engraved figures indicate the distance in µm from the substrate.

The measuring range from 5 to 1500 µm is sub-divided as follows:

- 5 - 100 µm (5 µm scale division)
- 100 - 300 µm (10 µm scale division)
- 300 - 700 µm (20 µm scale division)
- 700 - 1500 µm (40 µm scale division)

By covering this extensive measuring range, the instrument is especially good value for the user.
The instrument is supplied in a synthetic leather pocket.

Excellent Measuring Accuracy

- Maximum deviation 3 µm (5 - 55 µm) or 5% from nominal value (60 - 1500 µm),
- Typical deviation less than 3 µm over the entire scale range.

Certifiable for QA Systems

Unlike the model 333 measuring blade, the model 433 film thickness gauge can be supplied - *at extra charge* - with a manufacturer's test certificate M to DIN 55 350 T 18. This certificate includes details of the values relating to the specific quality features of each individual instrument as determined in the ERICHSEN testing laboratory. It is no longer necessary for the user to carry out incoming tests.

Measuring Procedure

Comparable with Model 333.



Order Information	
Order No.	**Product Name**
01690131	Wet film thickness gauge 433

Subject to technical modifications.

TBE/BAE – X/2026

CERTIFIED ISO 9001 BUREAU VERITAS

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