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Abrasive grains — Determination of capillarity

Grains abrasifs — Détermination de la capillarité



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Foreword

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International Standard ISO 9137 was prepared by Technical Committee ISO/TC 29, *Small tools*.

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Abrasive grains — Determination of capillarity

1 Scope

This International Standard specifies a method for the determination of the capillarity of abrasive grains.

It applies to abrasive grains which form the subject of ISO 6344-1, ISO 6344-2, ISO 6344-3 and ISO 8486.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6344-1:—¹⁾, *Coated abrasives — Grain size analysis — Part 1: Definitions, designation and principle.*

ISO 6344-2:—¹⁾, *Coated abrasives — Grain size analysis — Part 2: Determination of grain size distribution of macrogrits P 12 to P 220.*

ISO 6344-3:—¹⁾, *Coated abrasives — Grain size analysis — Part 3: Determination of grain size distribution of microgrits P 240 to P 1200.*

ISO 8486:1986, *Bonded abrasives — Grain size analysis — Designation and determination of grain size distribution of macrogrits F4 to F220.*

3 Definition

For the purposes of this International Standard, the following definition applies.

1) To be published.

capillarity of abrasive grains: The height to which water rises, owing to capillary action, in a given time, in a tube filled with abrasive grains.

4 Reagents

4.1 Cleaning solution, suitable for cleaning the glass tubes, the tray and the bronze mesh.

4.2 Distilled water, at a temperature of $18\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.

5 Apparatus

5.1 Capillarity measuring apparatus, consisting essentially of the following items (figure 1 shows a possible design of the apparatus).

5.1.1 Stand, for holding the glass tubes (5.1.2) in a vertical position.

5.1.2 Glass tubes, of length 300 mm and internal diameter $5\text{ mm} \pm 0,5\text{ mm}$, marked with a scale graduated in divisions of 1 mm such that the zero mark is 12 mm from the lower end of the tube. The upper end of the tubes may be funnel-shaped to facilitate the filling of the tubes with abrasive grains.

5.1.3 Bronze mesh, having an aperture size of 300 μm .

5.1.4 Water-tight tray, of suitable dimensions to accommodate the bronze mesh.

5.2 Oven, for drying the glass tubes (5.1.2).

5.3 Stop-watch, or other timing device.

6 Procedure

6.1 Prior to the determination, avoid manual contact with the abrasive grains and ensure that they do not come into contact with plastics as this could result in a strong reduction in the capillarity values.

6.2 Before each test, clean the glass tubes (5.1.2) in the cleaning solution (4.1), rinse them with distilled water (4.2), dry them in the oven (5.2) and then cool them to room temperature. Clean the water-tight tray (5.1.4) and the bronze mesh (5.1.3) similarly.

6.3 Place the bronze mesh in the bottom of the water-tight tray. Fasten the glass tubes prepared for the test in the stand (5.1.1) so that their lower ends rest on the bronze mesh. Pour the abrasive grains to be tested into the glass tubes, tapping the tubes carefully during this operation until no further measurable settling of the grains occurs.

6.4 Fill the water-tight tray up to the level of the zero mark on the tubes with distilled water at a temperature of $18\text{ °C} \pm 3\text{ °C}$. Start the stop-watch (5.3) at the moment when the water is poured into the tray.

6.5 After the given time interval (see clause 7), read the height to which the water has risen in the glass tube; this is the capillarity value, expressed in millimetres. To facilitate the reading, dye may be added to the distilled water provided that it does not alter the surface tension of the water.

7 Time Intervals

The time interval between the addition of the water and the reading of the capillary rise of the water in the tube shall be in accordance with the values given in table 1.

Table 1

Grain designation		Time interval
F ¹⁾	P ²⁾	min
20, 22, 24, 30, 36	20, 24, 30, 36	2
40, 46	40	3
54	50	3,5
60, 70	60	4
80, 90	80	5
100	100	6
120	120	8
150 and finer	150 and finer	10
1) See ISO 8486.		
2) See ISO 6344-1, ISO 6344-2 and ISO 6344-3.		

Dimensions in millimetres

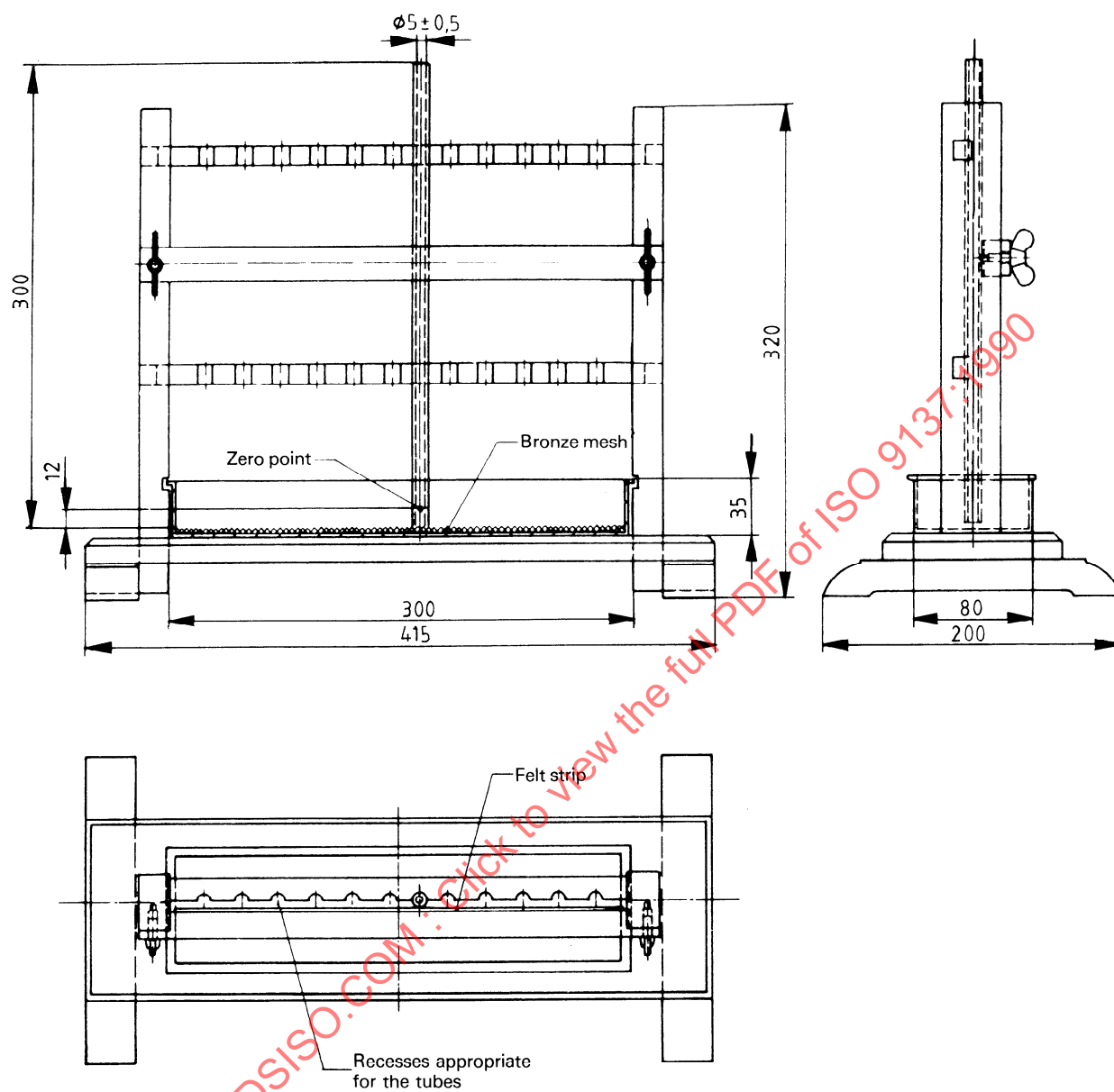


Figure 1 — Possible design of the capillarity measuring apparatus

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