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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1524

PAINTS AND VARNISHES

DETERMINATION OF FINENESS OF GRIND

1st EDITION

April 1971

For each individual country the only valid standard is the national standard of that country.

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BRIEF HISTORY

The ISO Recommendation R 1524, *Paints and varnishes – Determination of fineness of grind*, was drawn up by Technical Committee ISO/TC 35, *Paints and varnishes*, the Secretariat of which is held by the Nederlands Normalisatie-instituut (NNI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1524, which was circulated to all the ISO Member Bodies for enquiry in November 1969. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	Italy	Sweden
Chile	Netherlands	Switzerland
Denmark	New Zealand	Turkey
France	Poland	U.A.R.
Germany	Portugal	United Kingdom
Greece	South Africa, Rep. of	U.S.S.R.
Israel	Spain	Yugoslavia

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

ISO Recommendation | R 1524 | April 1971

PAINTS AND VARNISHES

DETERMINATION OF FINENESS OF GRIND

INTRODUCTION

This ISO Recommendation is one of a series dealing with the sampling and testing of paints, varnishes and related products. It should be read in conjunction with ISO Recommendation R 1512, *Paints and varnishes – Sampling,* and ISO/R 1513, *Paints and varnishes – Examination and preparation of samples for testing.*

1. SCOPE

This ISO Recommendation describes a method for determining the fineness of grind of paints and related products, by the use of a suitable gauge graduated in micrometres.

NOTE. – Various fineness-of-grind gauges, graduated in arbitrary units (see Appendix) are used in industry, but these are not recommended.

2. FIELD OF APPLICATION

This ISO Recommendation is applicable to all types of paints and related products. Of the three gauges referred to in clause 3.1, the 0 to 100 μm gauge is suitable for general use, but the 0 to 50 μm gauge and especially the 0 to 25 μm gauge will only provide reliable results in the hands of skilled laboratory personnel.

Particular caution is necessary in interpreting readings of less than 10 μm.

3. DEFINITION

Fineness of grind. The reading in micrometres obtained on a standard gauge under specified conditions of test, indicating the depth of the gauge at which discrete solid particles in the product are readily discernible.

4. APPARATUS

4.1 *Gauge*, consisting of a block of hardened steel approximately 175 mm in length, 65 mm in width and 13 mm thick.

The top surface of the block should be ground smooth and flat and should contain one or two grooves approximately 140 mm in length and 12.5 mm wide parallel to the longer sides of the block. Each groove should be tapered uniformly in depth lengthwise from a suitable depth (for example 25, 50 or 100 μm) at one end to zero depth at the other and should be graduated in accordance with its depth as specified in the Table below. (Diagrams of typical gauges are given in Figure 1.)

TABLE – **Graduation of typical gauges**

Depth range	Interval of graduation
μm	μm
100 to 0	10
50 to 0	5
25 to 0	2.5

NOTES

1. Steel gauges of the approximate dimensions stated are suitable for the test, but other gauges giving similar results may be used.
2. Since the exact value reported as fineness-of-grind depends in part on the gauge used (see section 6), it is essential to identify the gauge (0 to 100 μm, 0 to 50 μm or 0 to 25 μm) when reporting results or specifying requirements.

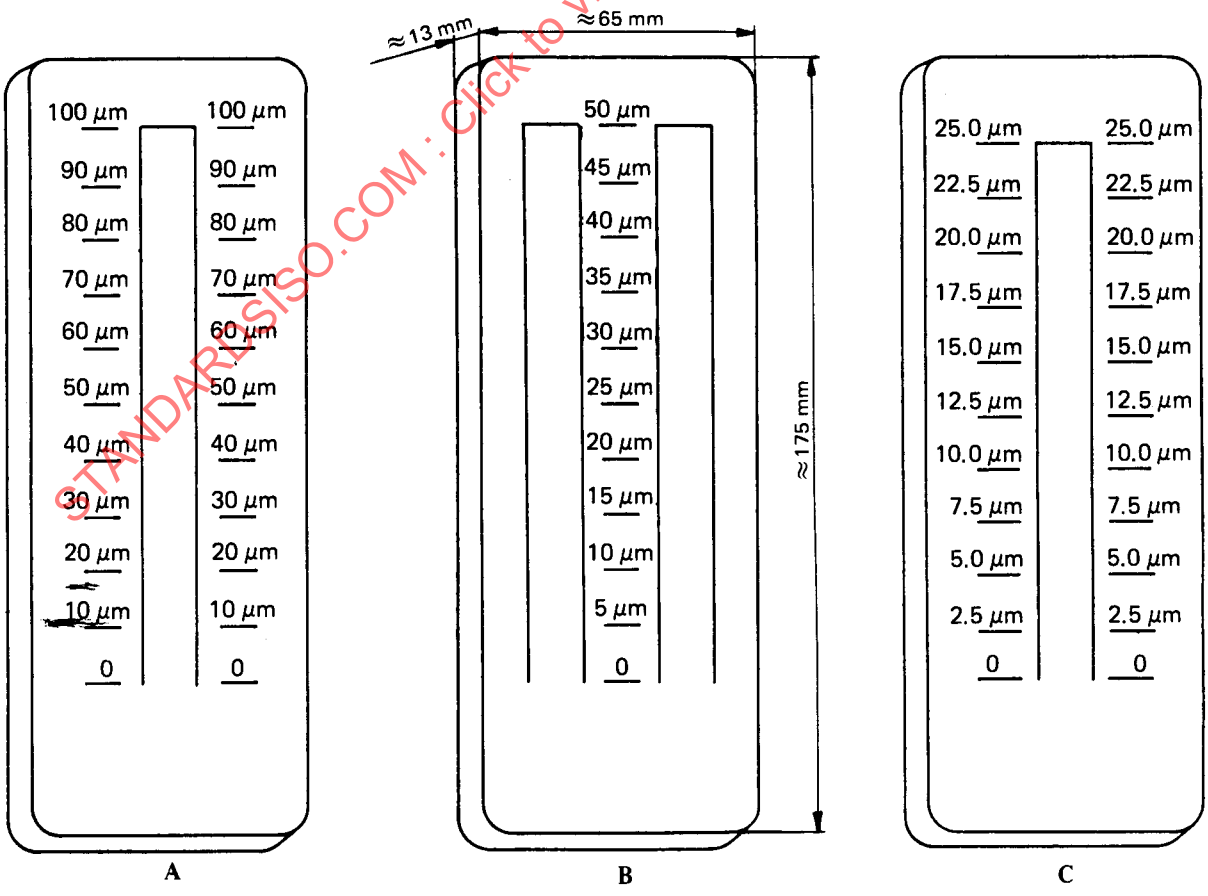

FIGURE 1 – **Typical gauges**

4.2 *Scraper*, consisting of a single or double-edged steel blade approximately 90 mm long, 40 mm wide and 6 mm thick. The edge or edges on the long sides should be straight, and rounded to a radius of approximately 0.25 mm. A drawing of a suitable scraper is shown in Figure 2.

NOTE. – Both the gauge and the scraper should be periodically checked for signs of wear; worn apparatus should be discarded.

Approximate dimensions in millimetres

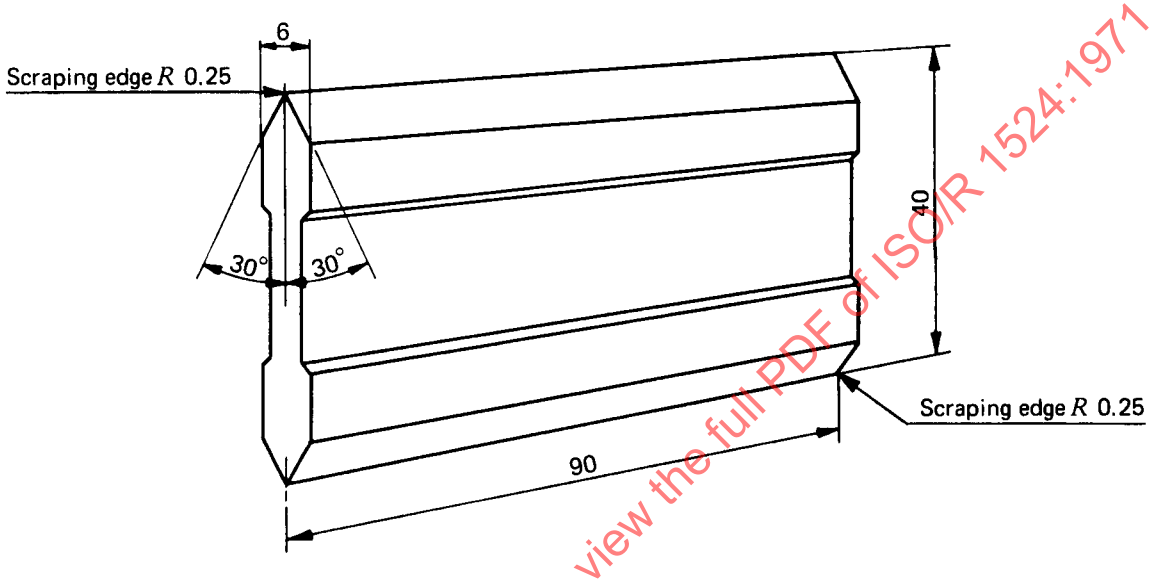

FIGURE 2 – Scraper

5. SAMPLING

A representative sample of the product to be tested should be taken as described in ISO Recommendation R 1512, *Paints and varnishes – Sampling*. The sample should then be examined and prepared for testing as described in ISO Recommendation R 1513, *Paints and varnishes – Examination and preparation of samples for testing*.

6. PROCEDURE

Place the gauge to be used, which should be thoroughly clean and dry, on a flat, horizontal, non-slipping surface. Pour a sufficient amount of sample into the deep end of the groove so that it overflows the groove slightly. Grasp the scraper between the thumbs and fingers of both hands and place it edgewise in contact with the surface of the gauge at the extreme deep end of the groove with the long dimension of the scraper parallel to the short dimension of the gauge. While holding the scraper perpendicular to the surface of the gauge and at right angles to the length of the groove, draw it at a uniform rate over the surface of the gauge to a point beyond the zero end of the groove in 2 to 3 seconds. Sufficient downward pressure should be exerted on the scraper just to fill the groove with the sample and to clean the level surface of the gauge. Determine in a time not exceeding 6 seconds from the completion of the drawdown, the fineness of grind of the product by viewing the gauge from the side in such a manner that the line of vision is at right angles to the long dimension of the groove and at an angle of not more than 30° nor less than 20° to the face of the gauge while it is in a light which will make the pattern of the product in the groove readily visible.

Observe the point along the groove where the product first shows a predominantly speckled appearance and, in particular, the two graduation marks between which the number of particles, in a band 3 mm wide across the groove, is of the order of 5 to 10 (see Figures 3 and 4). Estimate this position of the upper margin of this band and read the position as the fineness of grind to the nearest

5 μm for the 0 to 100 μm gauge;
2 μm for the 0 to 50 μm gauge;
1 μm for the 0 to 25 μm gauge.

Disregard any scattered specks which may appear prior to the point where the predominantly speckled appearance begins.

NOTE. – Not more than 10 seconds should elapse from the commencement of the drawdown to the completion of the reading. For this reason it is often advisable to make a preliminary determination to establish the approximate position of the first appearance of a predominantly speckled surface. A second and more accurate reading can then be made very rapidly.

The gauge and scraper should be cleaned carefully with a suitable solvent immediately after each reading.

Make three determinations (after the preliminary trial, if made).

7. EXPRESSION OF RESULTS

Calculate the mean of the three determinations and round the result to the same precision as the original readings.

8. TEST REPORT

The test report should include the following information :

(*a*) a reference to this ISO Recommendation or to a corresponding national standard;

(*b*) type and identification of the product under test;

(*c*) details of the gauge used;

(*d*) any deviation, by agreement or otherwise, from the test procedure described;

(*e*) the results of the test, expressed in micrometres (μm);

(*f*) date of the test.