INTERNATIONAL STANDARD

ISO 8781-2

First edition
1990-11-15

Pigments and extenders — Methods of assessment of dispersion characteristics —

Part 2:
Assessment from the change in fineness of grind

Pigments et matières de charge — Méthodes d'évaluation de la dispersibilité —

Partie 2: Évaluation à partir de la variation de la finesse de broyage

Reference number
ISO 8781-2:1990(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 8781-2 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*.

ISO 8781 consists of the following parts, under the general title *Pigments and extenders — Methods of assessment of dispersion characteristics*:

— *Part 1: Assessment from the change in tinting strength of coloured pigments*

— *Part 2: Assessment from the change in fineness of grind*

— *Part 3: Assessment from the change in gloss*

Annex A forms an integral part of this part of ISO 8781.

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Printed in Switzerland

Introduction

The change of fineness of grind of a pigment in a dispersion is dependent on the amount of work done in the preparation of the dispersion of the pigment in a binder system. The ease with which ultimate fineness of grind is achieved may therefore be used to assess the dispersion characteristics of that pigment. Thus, if the ultimate fineness of grind can be attained easily, the pigment is considered to be readily dispersible.

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Pigments and extenders — Methods of assessment of dispersion characteristics —

Part 2:
Assessment from the change in fineness of grind

1 Scope

This part of ISO 8781 specifies a method for assessing, on the basis of fineness of grind, the dispersion characteristics of pigments which have been dispersed by one of the methods of dispersion described in ISO 8780. It should be read in conjunction with ISO 8780-1.

The method is of general use for comparing similar pigments, for example a test pigment against an agreed reference pigment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8781. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8781 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 1524:1983, *Paints and varnishes — Determination of fineness of grind.*

ISO 8780-1:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 1: Introduction.*

ISO 8780-2:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 2: Dispersion using an oscillatory shaking machine.*

ISO 8780-3:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 3: Dispersion using a high-speed impeller mill.*

ISO 8780-4:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 4: Dispersion using a bead mill.*

ISO 8780-5:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 5: Dispersion using an automatic muller.*

ISO 8780-6:1990, *Pigments and extenders — Methods of dispersion for assessment of dispersion characteristics — Part 6: Dispersion using a triple-roll mill.*

3 Principle

The pigment under test and, if provided, the agreed reference pigment are each dispersed in stages under specified conditions in an agreed binder system. After each incremental dispersion stage, a portion of the mill base is taken and its fineness of grind is determined as described in ISO 1524. The fineness-of-grind values are plotted graphically as a function of the dispersion work done (expressed as time, number of revolutions, etc.). From the graph, the work necessary to obtain an agreed fineness of grind is determined.

4 Required supplementary information

For any particular application, the test method specified in this part of ISO 8781 needs to be completed by supplementary information. The items of supplementary information are given in annex A.

5 Apparatus

Ordinary laboratory apparatus and glassware, together with the following:

5.1 Fineness-of-grind gauge, complying with the requirements of ISO 1524 [maximum depth of groove(s) 50 µm or 100 µm, depending on the pigment or extender and the resulting fineness of grind, but preferably 50 µm].

5.2 Spatula.

6 Procedure

6.1 Dispersion

Disperse each pigment sample in the agreed binder system at the agreed concentration using one of the methods described in ISO 8780. Carry out the dispersion of the mill base in at least four stages and select the intermediate stages such that they are approximately in geometric progression.

The final stage should be selected so that the fineness of grind of the pigment sample is better than or equal to that agreed. The intermediate stages should correspond to successive halving of the period required to attain the final stage.

If the ease of dispersion of the pigment to be tested under the given conditions is not known and thus the maximum dispersion effort to be used cannot be defined, then it should be determined in initial exploratory tests. For this, it is recommended that the fineness of grind of the pigment for at least two dispersion stages is determined. These fineness-of-grind values are plotted using logarithmic scales for both axes and the line joining these plotted values is extrapolated to a suitable target level of dispersion. Suitable intermediate dispersion levels are then selected.

NOTE 1 A fineness of grind of 5 µm may be found to be a suitable target dispersion level, although for less easily dispersed pigments 10 µm to 20 µm may be acceptable.

6.2 Determination of fineness of grind

Using the spatula (5.2), take small samples from the mill base after each of the specified dispersion stages, and determine the fineness of grind in each case using the method described in ISO 1524.

If the fineness of grind agreed as a target level is not attained after the last of the specified dispersion stages, proceed as instructed in 7.2.

7 Expression of results

7.1 Plot the fineness-of-grind readings, in micrometres, obtained in 6.2 as a function of the incremental dispersion stages (which may be expressed as time, number of revolutions, etc.), using a logarithmic scale for both axes. Connect the points with a smooth curve.

NOTE 2 Generally, nearly linear curves are obtained in this way, thus aiding interpolation.

Determine the work necessary to attain the target fineness of grind, by interpolation, from the graph, expressing the result as milling time, number of revolutions of an automatic muller, etc.

7.2 In cases where the agreed fineness of grind cannot be attained, report the fineness measured after the final dispersion stage as the highest practically attainable fineness of grind.

8 Test report

The test report shall contain at least the following information:

a) all details necessary to identify the product tested;

b) a reference to this part of ISO 8781 and the relevant part of ISO 8780;

c) the items of supplementary information referred to in annex A;

d) the dispersion work done (see 7.1) and the corresponding target level of fineness of grind or, if the agreed target level was not achieved, the highest practically attainable fineness of grind together with the work required to reach it (see 7.2);

e) the graph representing the development of fineness of grind (see 7.1);

f) any deviation from the procedure specified;

g) the date(s) of the test.