International Standard ISO 787/7

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General methods of test for pigments and extenders — Part 7 : Determination of residue on sieve — Water method — Manual procedure

Méthodes générales d'essai des pigments et matières de charge — Partie 7 : Détermination du refus sur tamis — Méthode à l'eau — Méthode manuelle

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

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International Standard ISO 787/7 was developed by Technical Committee ISO/TC 35, *Paints and varnishes*, and was circulated to the member bodies in December 1979.

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It has been approved by the member bodies of the following countries :

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Australia	India	Poland
Austria	Ireland	Romania
Brazil	Israel	South Africa, Rep. of
Canada	Italy	Spain
China	Kenya	Sweden
Egypt, Arab Rep. of	Korea, Rep. of	Switzerland
France	Netherlands	USSR
Germany, F. R.	Norway	

The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

This International Standard cancels and replaces ISO Recommendation R 787/7-1968, of which it constitutes a technical revision.

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The purpose of this International Standard is to establish a series of general test methods for pigments and extenders which are suitable for all or many of the individual pigments and extenders for which specifications might be required. In such cases, a cross-reference to the general method should be included in the International Standard relating to that pigment or extender, with a note of any detailed modifications which might be needed in view of the special properties of the product in question.

Technical Committee ISO/TC 35, *Paints and varnishes*, decided that all the general methods should be published as they become available, as parts of a single International Standard, in order to emphasize the relationship of each to the whole series.

The Technical Committee also decided that, where two or more procedures were widely used for determining the same or a similar characteristic of a pigment or extender, there would be no objection to including more than one of them in the ISO series. In such cases it will, however, be essential to state clearly in a specification which method is to be used and, in the test report, which method has been used.

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Parts of the series already published are as follows :

Part 1 : Comparison of colour of pigments
Part 2 : Determination of matter volatile at 105 °C
Part 3 : Determination of matter soluble in water — Hot extraction method
Part 4 : Determination of acidity or alkalinity of the aqueous extract
Part 5 : Determination of oil absorption value
Part 6 : Determination of residue on sieve — Oil method
Part 7 : Determination of residue on sieve — Water method — Manual procedure
Part 8 : Determination of matter soluble in water — Cold extraction method
Part 9 : Determination of pH value of an aqueous suspension
Part 10 : Determination of density — Pyknometer method
Part 11 : Determination of tamped volume and apparent density after tamping
Part 13 : Determination of water-soluble sulphates, chlorides and nitrates
Part 14 : Determination of resistivity of aqueous extract
Part 15 : Comparison of resistance of coloured pigments of similar types to light from a specified light source
Part 16 : Comparison of relative tinting strength (or equivalent colouring value) and colour on reduction in linseed stand oil using the automatic muller
Part 17 : Comparison of lightening power of white pigments
Part 18 : Determination of residue on sieve — Water method — Mechanical flushing procedure
Part 19 : Determination of water-soluble nitrates — Salicylic acid method
Part 20 : Comparison of ease of dispersion — Oscillatory shaking method
Part 21 : Comparison of heat stability of pigments using a stoving medium
Part 22 : Comparison of resistance to bleeding of pigments
Part 23 : Determination of density (using a centrifuge to remove entrained air)
Part 24 : Determination of relative tinting strength of coloured pigments and relative scattering power of white pigments — Photometric method

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General methods of test for pigments and extenders — Part 7 : Determination of residue on sieve — Water method — Manual procedure

0 Introduction

This document is a part of ISO 787, *General methods of test for pigments and extenders.*

1 Scope and field of application

This part of ISO 787 specifies a general method of test for determining the residue on sieve from a sample of pigment or extender dispersed in water.

Part 18 of ISO 787 specifies a general method of test for determining the residue on sieve from a sample of pigment or extender by a mechanical flushing procedure. For most pigments and extenders, these two methods will usually give different results, and it is therefore essential to state clearly in a specification which method is to be used, and in the test report, which method has been used.

NOTE — When this general method is applicable to a given pigment or extender, only a cross-reference to it should be included in the International Standard relating to that pigment or extender, with a note of any detailed modification which may be needed in view of the special properties of the material in question. Only when neither of these general methods is applicable to a particular material should a special method for determination of residue on sieve be specified.

2 References

ISO 565, *Test sieves — Woven metal wire cloth and perforated plate — Nominal sizes of apertures.*

ISO 787/18, *General methods of test for pigments and extenders — Part 18 : Determination of residue on sieve — Water method — Mechanical flushing procedure.*[1)]

ISO 842, *Raw materials for paints and varnishes — Sampling.*

ISO 3262, *Extenders for paints.*

ISO 4793, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation.*

3 Apparatus

Ordinary laboratory apparatus and

3.1 Sieve, of nominal mesh aperture, complying with the requirements of ISO 565.

The nominal mesh aperture and the diameter of the sieve used shall be stated in the test report.

NOTE — Sieves of nominal mesh aperture of 45 µm are frequently used. It is recommended that the mesh apertures of the sieve should be periodically examined, using a microscope, to establish that blockage or undue wear has not occurred. The sieve should be discarded if the mesh apertures have been affected.

3.2 Brush, hog bristle, approximate dimensions 5 mm thick, 20 mm wide, 35 mm long.

3.3 Sintered glass crucible, of porosity grade P 40 (pore size index 16 to 40 µm) in accordance with ISO 4793, or **weighing bottle.**

3.4 Oven, capable of being maintained at 105 ± 2 °C.

3.5 Balance, accurate to 1 mg or better.

3.6 Desiccator, containing an efficient desiccant.

3.7 Washbottle, containing the solution used to disperse the test portion.

4 Sampling

Take a representative sample of the material to be tested as described in ISO 842.

1) At present at the stage of draft. (Revision of ISO 787/18-1973.)

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5 Procedure

Carry out the determination in duplicate.

5.1 Test portion

Weigh, to the nearest 0,1 g, into a beaker of suitable capacity, a quantity of the sample such that a sufficient residue on the sieve (3.1) is obtained. Generally, a test portion of 10 to 100 g is necessary, but in the case of products yielding a very low residue on the sieve a larger test portion, up to 1 000 g, should be used.

5.2 Preparation of the dispersion

Disperse the test portion (5.1) in a suitable volume of water (about 300 to 600 ml) containing, if required, a suitable dispersing agent (see note 1). If the product specification advises that mechanical assistance is commonly required to achieve thorough dispersion, a stirrer and stirrer head as specified in ISO 3262, sub-clause 9.2.4 shall be used, and it is recommended that the rotation of the stirrer should not exceed 500 ± 50 r/min. The use of a mechanical stirrer shall be stated in the test report.

NOTES

1 The quantity of the dispersing agent should be between 0,2 and 0,5 % of the mass of the test portion. The type and quantity of the dispersing agent to be used should be agreed between the parties and indicated in the test report.

2 It is important that the dispersion of the pigment or extender in the aqueous medium should be thorough and that no flocculation should occur during the determination (5.3).

5.3 Determination

Pour the dispersion, if necessary in portions, through the sieve (3.1). With the aid of the washbottle (3.7) filled with the solution used to disperse the test portion, rinse out the beaker and pour all the rinsings through the sieve. Wash the test portion with the same solution until the washings passing through the sieve are clear and free of dispersed material. During this process, the duration of which should not exceed 5 min, care should be taken to avoid the destruction of agglomerates. Finally wash any adherent particles with the brush (3.2) into the sieve and wash the residue on the sieve with water to free it from the dispersing agent.

NOTE — In order to avoid false test results, the water should be filtered by a suitable filtering device.

Treat the residue on the sieve according to one of the following alternative procedures :

a) Wash the residue into the previously heated and weighed sintered glass crucible (3.3) and dry in the oven (3.4) at 105 ± 2 °C for 1 h. Allow to cool in the desiccator (3.6) and weigh to the nearest 1 mg. Repeat the heating for at least 30 min, allow to cool in the desiccator, insert the stopper and again weigh to the nearest 1 mg. Repeat this procedure until two successive weighings differ by not more than 5 mg. Record the lower mass.

b) Transfer the residue with distilled water into a previously heated and weighed 50 ml beaker. Evaporate the water and dry in the oven at 105 ± 2 °C for 1 h. Continue as described under a) above.

c) Dry the residue on the sieve in the oven at 105 ± 2 °C for 1 h. Transfer the residue into the previously heated and weighed weighing bottle (3.3) and weigh to the nearest 1 mg. Repeat the heating for at least 30 min, allow to cool in the desiccator, insert the stopper and again weigh to the nearest 1 mg. Repeat this procedure until two successive weighings differ by not more than 5 mg. Record the lower mass.

If the two determinations differ by more than 10 % of the larger value (unless the difference is less than 5 mg), repeat the procedure (clause 5).

5.4 Examination of the residue

Inspect the residue for the presence of incompletely dispersed pigment or extender and, if present, repeat the whole procedure (clause 5) using an alternative dispersing agent agreed between the parties.

If the residue contains extraneous matter, report its presence and nature.

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6 Expression of results

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6.1 Calculation

Calculate the residue on sieve by the equation

$$R = \frac{100 \times m_1}{m_0}$$

where

R is the residue on sieve, expressed as a percentage by mass;

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, of residue.

Calculate the mean of two determinations and report the result to two significant figures. If the mean value is below 0,01 %, report the result as "less than 0,01 %".

6.2 Precision

No precision data are currently available.

7 Test report

The test report shall contain at least the following information :

a) the type and identification of the product tested;

b) a reference to this International Standard (ISO 787/7);

c) the result of the test as indicated in clause 6;

d) the nominal mesh aperture and the diameter of the sieve used;

e) the mass of each test portion;

f) the method of dispersion (5.2) and, if used, the type and concentration of the dispersing agent and the speed of the mechanical stirrer;

g) a description of the type and condition of the residue on sieve (5.4);

h) any deviation, by agreement or otherwise, from the procedure specified;

j) the date of the test.

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