INTERNATIONAL STANDARD

ISO 787-7

Second edition
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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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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 787-7 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 2, *Pigments and extenders*.

This second edition cancels and replaces the first edition (ISO 787-7:1981), which has been technically revised. The main technical changes are:

a) the apparatus clause has been amended;

b) a number of modifications have been made to the determination.

ISO 787 consists of the following parts, under the general title *General methods of test for pigments and extenders*:

— *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 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 sulfates, chlorides and nitrates*

— *Part 14: Determination of resistivity of aqueous extract*

— *Part 15: Comparison of resistance to light of coloured pigments of similar types*

— *Part 16: Determination of relative tinting strength (or equivalent colouring value) and colour on reduction of coloured pigments — Visual comparison method*

— *Part 17: Comparison of lightening power of white pigments*

— *Part 18: Determination of residue on sieve — Mechanical flushing procedure*

— *Part 19: Determination of water-soluble nitrates (Salicylic acid 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 methods*

— *Part 25: Comparison of the colour, in full-shade systems, of white, black and coloured pigments — Colorimetric method*

Parts 6, 12 and 20 have been withdrawn.

General methods of test for pigments and extenders —

Part 7: Determination of residue on sieve — Water method — Manual procedure

1 Scope

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.

ISO 787-18, *General methods of test for pigments and extenders — Part 18: Determination of residue on sieve — Mechanical flushing procedure*, 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, ISO 787-7 and ISO 787-18 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 The general methods given in the various parts of ISO 787 are usually applicable to any pigment or extender. Thus only a cross-reference to the appropriate part of ISO 787 needs to be included in the International Standard giving the specification for that pigment or extender, indicating any detailed modifications that may be needed in view of the special properties of the material in question. Only when the general methods are not applicable to a particular material should a different method for determination of residue on sieve be specified.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 3262-9:1997, *Extenders for paints — Specifications and methods of test — Part 9: Calcined clay*

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

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Sampling

Take a representative sample of the material to be tested, as described in ISO 15528.

4 Apparatus

Use ordinary laboratory apparatus and glassware, together with the following:

4.1 Sieve, of nominal mesh aperture as required, 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.

Sieves of nominal mesh aperture 45 µm are frequently used. It is recommended that the mesh apertures of the sieve 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.

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

4.3 Sintered-glass crucible, of porosity grade P 40 (pore size index 16 µm to 40 µm) as defined in ISO 4793, or **50 ml beaker**.

4.4 Oven, capable of being maintained at (105 ± 2) °C.

4.5 Balance, capable of weighing up to 1 000 g to the nearest 0,1 g.

4.6 Balance, capable of weighing to the nearest 1 mg.

4.7 Desiccator, containing an efficient desiccant.

4.8 Washbottle, to contain the solution used to disperse the test portion.

5 Procedure

5.1 General

Carry out the determination in duplicate.

5.2 Test portion

Using balance 4.5, 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 (4.1) is obtained. Generally, a test portion of 10 g 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.

5.3 Preparation of the dispersion

Disperse the test portion (see 5.2) in a suitable volume of water (about 300 ml to 600 ml) containing, if required, a suitable dispersing agent (see, however, the second and third paragraphs below). If the product specification advises that mechanical assistance is commonly required to achieve thorough dispersion, a stirrer and stirrer head as specified in ISO 3262-9:1997, Subclause 6.3.4 (see Annex A), shall be used, and it is recommended that the rotation of the stirrer should not exceed (500 ± 50) min^{-1}. The use of a mechanical stirrer shall be stated in the test report.

If agreed between the interested parties, the test portion may be transferred directly to the sieve, without previous dispersion.

The quantity of the dispersing agent should preferably 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 shall be agreed between the interested parties and indicated in the test report.

It is important that the dispersion of the pigment or extender in the aqueous medium be thorough and that no flocculation should occur during the determination (see 5.4).

5.4 Determination

Pour the dispersion, if necessary in portions, through the sieve (4.1). With the aid of a washbottle (4.8) 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. When the test portion has simply been dispersed in water, tap water from a sprinkling rose may be used for rinsing.

Depending on previous agreement between the interested parties, either break up pigment agglomerates on the sieve by application of gentle pressure using a brush (4.2) or leave such agglomerates untreated. If a brush is used, wash any particles adhering to the brush onto the sieve and wash the residue on the sieve with water to free it from dispersing agent.

In order to avoid false test results, the water should preferably be filtered.

Treat the residue on the sieve in accordance with one of the following alternative procedures:

a) Wash the residue with distilled water into a previously heated and weighed sintered-glass crucible (4.3), allow the water to filter through and dry the residue in the oven (4.4) at (105 ± 2) °C for 1 h. Allow to cool in the desiccator (4.7) and weigh to the nearest 1 mg. Use balance 4.6 for these weighings. Calculate the mass of the residue.

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.

If the melting point of the residue on the sieve is lower than 110 °C, a more suitable drying temperature shall be used and this shall be stated in the test report.

If the two determinations differ by more than 10 % of the larger value (unless the difference is less than 5 mg), repeat the procedure (i.e. 5.1 to 5.4).

5.5 Examination of the residue

Inspect the residue for the presence of incompletely dispersed pigment or extender and, if present, repeat the whole process (i.e. 5.1 to 5.5) using an alternative dispersing agent agreed between the parties.

The nature of any extraneous matter in the residue shall be reported.

6 Expression of results

6.1 Calculation

Calculate the residue on sieve R, expressed as a percentage by mass, using the following equation:

$$R = \frac{100 \times m_1}{m_0} \qquad (1)$$

where

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

m_1 is the mass, in grams, of the residue.

Calculate the mean of two valid 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 %”.