International Standard 787/3

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

General methods of test for pigments and extenders — Part 3 : Determination of matter soluble in water — Hot extraction method

Méthodes générales d'essai des pigments et des matières de charge — Partie 3 : Détermination des matières solubles dans l'eau — Méthode par extraction à chaud

First edition — 1979-09-15

UDC 667.622 : 620.1 : 543.831 **Ref. No. ISO 787/3-1979 (E)**

Descriptors : paints, pigments, tests, chemical analysis, determination of content, soluble matter, water, boiling water, extraction analysis

Price based on 2 pages

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.

International Standard ISO 787/3 was developed by Technical Committee ISO/TC 35, *Paints and varnishes*, and was circulated to the member bodies in November 1977.

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

Australia	Ireland	Romania
Austria	Israel	South Africa, Rep. of
Brazil	Italy	Spain
Canada	Kenya	Sweden
Egypt, Arab Rep. of	Netherlands	Switzerland
France	New Zealand	Turkey
Germany, F. R.	Norway	United Kingdom
India	Peru	USSR
Iran	Poland	Yugoslavia

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 787/3-1968 of which it constitutes a technical revision.

General methods of test for pigments and extenders — Part 3 : Determination of matter soluble in water — Hot extraction method

0 Introduction

This document is a part of ISO 787, *General methods of test for pigments and extenders*. The first edition was published in July 1968 and subsequently work was carried out in an attempt to improve reproducibility. As a result of this work, it was found that three factors were of prime importance. The first was the type of water used, the second was the type of filter used and the third was the mass of the test portion. Unfortunately insufficient tests have been carried out to be able to fix reliable reproducibility limits but it is considered inappropriate to proceed further with the work.

1 Scope and field of application

1.1 Part 3 of this International Standard specifies a general method of test for determining the percentage by mass of matter soluble in boiling water, in a sample of pigment or extender.

1.2 Part 8 of this International Standard specifies a method for determining the percentage by mass of matter soluble in water by cold extraction. For most pigments and extenders, these two test methods will 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 need 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 water-soluble matter be specified.

2 References

ISO 787, *General methods of test for pigments and extenders* —

Part 4 : Determination of acidity or alkalinity of the aqueous extract.

Part 8 : Determination of matter soluble in water — Cold extraction method.

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

3 Reagent

Distilled water, fresh, double distilled or de-ionized water, of pH 6 to 7.

NOTE — Other water may be used but only by agreement between the interested parties.

4 Apparatus

4.1 One-mark volumetric flask, of capacity 250 ml.

4.2 Colloid filter.

NOTE — Other types of filter may be used but only by agreement between the interested parties.

4.3 Evaporating dish, flat bottomed, of glass, platinum, glazed porcelain or silica.

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

4.5 Balance, accurate to 1 mg or better.

4.6 Desiccator.

5 Sampling

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

6 Procedure

6.1 Test portion

Weigh 2 to 20 g of the sample, to the nearest 0,01 g, into a beaker.

NOTE — The mass of the test portion used shall be chosen according to the type of the material and to the amount of water-soluble matter in the material. This is particularly important for materials that contain large amounts of matter soluble in water. In any case, the same test portion mass shall be taken for repeat tests or for tests between different laboratories.

6.2 Determination

Wet the test portion in the beaker with a few millilitres of the water (clause 3). (See note 1.)

Add 200 ml of the water and stir. Unless a different period is specified for the material under test, boil the water for 5 min. A coagulating agent can be used if the semi-colloidal nature of the material makes this desirable, provided that the agent selected is not such as to affect the subsequent determination of the acidity or alkalinity of the aqueous extract[1], and provided that only the minimum quantity is used.

Cool rapidly to room temperature, transfer to the volumetric flask (4.1) and dilute to the mark with the water. Mix thoroughly by shaking and inversion, and filter through the colloid filter (4.2), returning the filtrate to the filter until it runs clear. Evaporate 100 ml of the perfectly clear filtrate to dryness in the previously weighed evaporating dish (4.3) on a water bath. (See note 2.)

Dry the residue in the evaporating dish in the oven (4.4) at 105 ± 2 °C, cool in the desiccator (4.6) and weigh to the nearest 1 mg. Repeat the heating and cooling until the results of the two last weighings, at an interval including at least 30 min heating, do not differ by more than 10 % of the final figure obtained for the water-soluble matter.

NOTES

1 If the material does not disperse easily in water, a wetting agent shall be used. In the case of materials not soluble in ethanol, 5 ml of ethanol may be used; in the case of pigments soluble in ethanol, a non-ionic wetting agent such as 10 ml of a 0,01 % solution of a ethylene oxide condensate should be used. If the wetting agent is non-volatile under the conditions of test, an appropriate correction derived from a blank test should be made.

2 If required, the time between the end of the boiling and the beginning of the filtration should be specified and indicated in the test report.

7 Expression of results

The water-soluble matter (hot extraction method), expressed as a percentage by mass, is given by the formula

$$\frac{250\ m_1}{m_0}$$

where

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

m_1 is the mass, in grams, of residue.

Take the mean of two determinations and report the result to one decimal place.

8 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 787/3);

c) the result of the test as indicated in clause 7;

d) the mass of the test portion used;

e) any deviation, by agreement or otherwise, from the procedure specified, particularly any details of the filter and the water used;

f) the date of the test.

1) See ISO 787/4.