

**Pigmentide ja täiteainete katsetamise
üldmeetodid. Osa 16: Suhtelise
värvivuse (või võrdse
värviintensiivsuse) ja värvuse
määramine värvipigmentide
vähenemise korral. Visuaalne
võrdlusmeetod**

General methods of test for pigments and extenders
- Part 16: Determination of relative tinting strength
(or equivalent colouring value) and colour on
reduction of coloured pigments - Visual comparison
method

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 787-16:2000 sisaldab Euroopa standardi EN ISO 787-16:1995 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 787-16:2000 consists of the English text of the European standard EN ISO 787-16:1995.</p> <p>This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: EN ISO 787 see osa kirjeldab üldist katsemeetodit kahe sarnase värvusega pigmendi toonimistugevuse ja värvuse võrdlemiseks, kusjuures tulemus väljendatakse kas suhtelise toonimistugevuse või võrdse värviintensiivsusega.</p>	<p>Scope:</p>
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ICS 87.060.10

Võtmesõnad: katsed, määramine, pigmendid, täiteained, võrdlusanalüüs, värvid, värviintensiivsus

ICS 87.060.10

Descriptors: Pigments, coloured pigments, testing, tinting strength, comparison method.

English version

General methods of test for pigments and extenders

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

Visual comparison method
(ISO 787-16:1986)

Méthodes générales d'essai des pigments et matières de charge. Partie 16: Détermination du pouvoir colorant relatif (ou valeur de coloration équivalente) et de la couleur dégradée des pigments colorés; méthode de comparaison visuelle (ISO 787-16:1986)

Allgemeine Prüfverfahren für Pigmente und Füllstoffe. Teil 16: Bestimmung der relativen Farbstärke (oder des Färbeäquivalentes) und der Farbe in Weißaufhellung von Buntpigmenten; visuelles Angleichverfahren (ISO 787-16:1986)

This European Standard was approved by CEN on 1995-03-23 and is identical to the ISO Standard as referred to.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

International Standard

ISO 787-16:1986 General methods of test for pigments and extenders; determination of relative tinting strength (or equivalent colouring value) and colour on reduction of coloured pigments; visual comparison method, which was prepared by ISO /TC 35 'Paints and varnishes' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 298 'Pigments and extenders' as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by February 1996 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 787-16:1986 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

0 Introduction

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

This revision of ISO 787/16 has been carried out to align the presentation and procedures with those given in ISO 787/24, which describes a photometric method for comparing relative tinting strength and colour on reduction of coloured pigments. The title has been amended to differentiate between this part of ISO 787 and ISO 787/24.

The degree of development of tinting strength of a coloured pigment is dependent on the amount of work done in the preparation of the dispersion, so that in determining the relative tinting strengths of two coloured pigments it is necessary for the comparison to be carried out at the level of maximum development. In this method, which uses an automatic muller, the development of tinting strength is influenced by the force applied, the number of revolutions, the binder, the volume of the mix, and the rheology of the mix. The preliminary test described in 8.2 is used to establish the conditions under which a practical maximum of tinting strength may be obtained on the automatic muller. When these conditions are known for a particular pigment, the preliminary test is unnecessary and the procedure described in 8.3 to 8.5 is followed directly.

The complete test procedure consists of four parts:

- determination of the conditions for the preparation of the dispersion of the coloured pigment, and determination of the ratio of coloured pigment to white pigment (see 8.2);
- preparation of the dispersion of the coloured pigment (see 8.3);
- mixing of the dispersions of coloured pigment and white pigment (see 8.4);
- comparison of the colour on reduction of the two mixtures, one from the test sample and the other from the agreed reference pigment (see 8.5).

The method described is intended as a referee method. It is realized that other binders and white pigments may be used for control purposes in laboratories or by agreement between the interested parties.

For any particular application, the method of test described in this International Standard needs to be completed by the following supplementary information. This information should be derived, in part or totally, from an (inter)national standard or other document related to the product under test or, if appropriate, should be agreed between the interested parties.

- a) The binder that should be used (see 5.1).
- b) The volume (which should be about 2 ml) of the mix of pigment and binder.
- c) The ratio of pigment to binder.
- d) The ratio of coloured pigment to white pigment.
- e) The force (which should be the maximum available) that should be applied to the upper plate of the automatic muller.
- f) The number of revolutions of the automatic muller to be used.

1 Scope and field of application

This part of ISO 787 describes a general method of test for comparing the tinting strength and colour on reduction of two similar coloured pigments, the results being expressed either as "relative tinting strength" or as "equivalent colouring value".

ISO 787/24 describes a general method of test for determining the relative tinting strength of coloured pigments using a photometric method.

NOTES

- 1 When this general method is applicable to a given pigment, only a cross-reference to it should be included in the International Standard relating to that pigment, indicating any detailed modification which

may be needed in view of the special properties of the product in question. Only when this general method is not applicable to a particular material should a different method for determination of relative tinting strength and colour on reduction be specified.

2 This method should not be used for those yellow pigments for which it is difficult to evaluate the tinting strength with the aid of a white pigment paste. In this case, it is common practice to use a blue pigment paste and to compare the strength and undertone of the resulting green pastes. The choice of the blue and white pigments for the blue pigment paste and its composition should be the subject of an agreement between the interested parties.

2 References

ISO 591, *Titanium dioxide pigments for paints.*

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

ISO 1524, *Paints and varnishes — Determination of fineness of grind.*

ISO 3219, *Plastics — Polymers in the liquid, emulsified or dispersed state — Determination of viscosity with a rotational viscometer at defined shear rate.*

ISO 3262, *Extenders for paints.*

ISO 3668, *Paints and varnishes — Visual comparison of the colour of paints.*

ISO 3682, *Binders for paints and varnishes — Determination of acid value — Titrimetric method.*

ISO 4629, *Paint media — Determination of hydroxyl value — Titrimetric method.*¹⁾

3 Definitions

3.1 white pigment paste: A dispersion of a white pigment in a binder.

3.2 reduction paste; reduced paste: A paste resulting from mixing a dispersion of a coloured pigment in a binder with a white pigment paste.

3.3 colour on reduction: The colour of a pigment when it has been incorporated in a white pigment paste (3.2).

3.4 reduction ratio: The proportion, by mass, of a coloured pigment to a white pigment in a reduction paste.

4 Principle

A dispersion of the coloured test sample, prepared under defined conditions on an automatic muller, is mixed in a known ratio with a white pigment paste. The strength and undertone of the resulting reduction paste are compared with those of a similar paste made under the same conditions from the agreed reference pigment and the same white pigment paste.

5 Materials

5.1 Binder

The binder shall be agreed between the interested parties. The choice of binder should be made with regard to the field of application of the pigments being tested. For example, the following binders are suggested:

NOTE — The proposed binders are available commercially.

5.1.1 Alkyd resin based on a mixture of 63 % (*m/m*) linseed oil and 23 % (*m/m*) phthalic anhydride, and complying with the following requirements:

		Test method
acid value	15 mg KOH/g max.	ISO 3682
viscosity (solvent free)	7 to 10 Pa·s	ISO 3219
hydroxyl content	about 40 mg KOH/g	ISO 4629

5.1.2 Urethane-modified linseed oil, complying with the following requirements:

		Test method
linseed oil content	approximately 80 %	
acid value	nil	ISO 3682
free isocyanate groups	nil	
free hydroxyl groups	0,8 to 1,2 %	
viscosity at 20 °C	15 to 18 Pa·s	ISO 3219

5.2 White pigment paste

The composition of the white pigment paste shall be agreed between the interested parties. The choice of the white pigment paste shall be made with regard to the nature of the pigment being tested and the binder in the paste shall be compatible with the binder to be used in the coloured pigment dispersion (see 8.2.1). Unless otherwise specified, one of the following binders shall be used.

NOTE — It is strongly recommended that the same binder should be used for the white pigment paste and for the coloured dispersion as this will minimize the likelihood of flocculation and similar effects. See the note in 5.1.

5.2.1 Paste based on alkyd resin, with the following composition:

- 40 parts by mass of titanium dioxide, Grade R2, complying with the requirements of ISO 591;
- 56 parts by mass of alkyd resin (5.1.1);
- 4 parts by mass of calcium stearate.

Using a spatula, mix well so as to achieve preliminary wetting of the solids. Then grind on a triple-roll mill until the particle size is less than 5 µm when tested on a fineness-of-grind gauge (see ISO 1524). Store in airtight containers, preferably collapsible tubes with screw caps.

1) In course of preparation. (Revision of ISO 4629-1978.)