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## General methods of test for pigments and extenders — Part 21 : Comparison of heat stability of pigments using a stoving medium

*Méthodes générales d'essai des pigments et matières de charge —  
Partie 21 : Comparaison de la stabilité à la chaleur des pigments en utilisant un liant au four*

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**Descriptors :** paints, pigments, tests, high temperature tests, stability tests, thermal stability, comparative tests.

## 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 787/21 was developed by Technical Committee ISO/TC 35, *Paints and varnishes*, and was circulated to the member bodies in March 1978.

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

Australia	Israel	Romania
Bulgaria	Italy	South Africa, Rep. of
Canada	Kenya	Sweden
Egypt, Arab Rep. of	Korea, Rep. of	Switzerland
Germany, F. R.	Netherlands	Turkey
India	New Zealand	United Kingdom
Iran	Norway	Yugoslavia
Ireland	Poland	

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

France

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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 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.

Parts of the series already published are as follows :

- Part 1 : Comparison of colour
- 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
- 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 12 : Visual comparison of hue of powdered white pigment (Hollow cone method)<sup>1)</sup>
- 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 by a 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)

1) This part will be withdrawn as the specified method is no longer in use.

# General methods of test for pigments and extenders — Part 21 : Comparison of heat stability of pigments using a stoving medium

## 0 Introduction

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

Although the method as written is intended for comparing the heat stability of pigments by specifying the temperatures of heating and the time of heating, it may also be used for determining the heat resistance of a pigment.

## 1 Scope and field of application

This part of ISO 787 specifies a general method of test for comparing the heat stability of the pigment under test against that of an agreed sample.

NOTE — 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, with a note of any detailed modification which may be needed in view of the special properties of the pigment in question. Only when this general method is not applicable to a particular pigment should a special method for comparison of heat stability be specified.

## 2 References

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

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

## 3 Apparatus and materials

### 3.1 Panels

Any suitable light-gauge metal panels, for example of bright tinplate or aluminium, conveniently 150 mm × 100 mm, the surfaces of which have been cleaned and lightly abraded, or other suitable panels as agreed between the interested parties.

### 3.2 Agreed stoving medium.

3.3 **Oven**, well ventilated and capable of being maintained at the agreed temperature.

## 4 Sampling

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

## 5 Procedure

Prepare a dispersion of the pigment under test (alone or reduced to an agreed colour) in the agreed stoving medium by a suitable method to be agreed between the interested parties, including dilution of the dispersion to an appropriate consistency by further addition of the agreed medium or solvent.

Prepare a dispersion of the agreed sample in the same manner in the same medium.

Apply the dispersion of the pigment under test by an agreed method over the whole surface of a test panel, to give a wet film thickness of 75 to 120 μm. Apply the dispersion of the agreed sample in the same manner to the whole surface of another panel.

Allow the coated panels to remain at  $23 \pm 2$  °C and  $(50 \pm 5)$ % relative humidity for 30 min and then cut each panel into a suitable number of strips, each not less than 30 mm wide, to carry out the required tests, labelling each strip.

Stove one strip of each panel for an adequate period at the lowest temperature that will ensure full curing of the film.

NOTE — These panels are the standards against which other panels will be compared.

Stove other strip(s) of the panels coated with the test sample and agreed sample respectively at the temperature(s) and for the time(s) agreed between the interested parties.

Allow the panels to cool to room temperature.

By the procedure described in ISO 3668, compare in diffuse daylight the panels stoved at the higher temperature(s) of both the test sample and the agreed sample with the corresponding standard panels stoved at the minimum temperature. If daylight is not available, make the comparison in artificial daylight.

If required, the comparison shall be repeated after 48 h.

Note the degree of colour change of the pigment under test as being less than, equal to, or greater than the colour change of the agreed sample, stating for how long and at what temperature the particular panels were stoved.

NOTE — If required and agreed, a suitable colorimeter may be used for measuring the colour differences, in which case ensure that the panel is sufficiently large to permit the cutting of strips which are not distorted.

## 6 Test report

The test report shall include at least the following information :

- a) the type and identification of the pigment under test;
- b) a reference to this International Standard or to a corresponding national standard;

- c) the details of items agreed between the interested parties, including pigment concentration, reference pigment used, medium used, method of application and curing conditions of the test films;

- d) any deviation, by agreement or otherwise, from the test procedure specified;

- e) whether the comparison was made in natural or artificial daylight;

- f) the result of the test : heat stability (characterized by colour change) less than, equal to, or greater than that of the agreed sample of pigment;

- g) the date of the test.