BRITISH STANDARD

BS 3483-0: 1990

Methods for

Testing pigments for paints —

Part 0: General introduction

Confirmed November 2008

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Pigments, Paints and Varnishes Standards Policy Committee (PVC/-) to Technical Committee PVC/1, upon which the following bodies were represented:

Aluminium Coatings Association
Aluminium Federation
Aluminium Powder and Paste Association
Aluminium Window Association
British Cement Association
British Precast Concrete Federation Ltd.
Chartered Society of Designers
Chemical Industries Association
Department of the Environment (Building Research Establishment)
Hevac Association
Home Improvement Powder Coatings Association
Oil and Colour Chemists' Association
Paintmakers' Association of Great Britain Ltd.
Red Lead and Litharge Manufacturers' Association
Steel Window Association
Titanium Pigment Manufacturers' Technical Committee
Zinc Development Association

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Contents

Foreword

This Part of BS 3483 has been prepared under the direction of the Pigments, Paints and Varnishes Standards Policy Committe and supersedes BS 3483: General Introduction: 1974, which is withdrawn. Appendix A and Appendix B are identical with ISO 3270:1984 and ISO 3205:1976, respectively, published by the International Organization for Standardization (ISO).

This Part of BS 3483 differs from the previous "General Introduction" in that atmospheres for conditioning and testing and preferred test temperatures are included. This Part no longer lists those methods published to date, for which reference should be made to the BSI Catalogue, which is annually updated, *BSI News*, which announces new publications monthly, or the BSI bibliographic database "STANDARDLINE".

BS 3483 describes test methods used by the pigments industry for determining the quality of its products. It is intended that the appropriate methods be specified in all British Standard specifications for pigments.

In many of the methods, the test procedures are identical with those standarized by Technical Committee 35, Paints and Varnishes of ISO and, where this is so, the methods have been published as dual-numbered standards. Where the methods are generally similar to the ISO methods, an appropriate comment is included in the introductory clause to the method.

It is assumed in the drafting of all Parts of BS 3483 that they will be used and applied by those who are appropriately qualified and experienced. The procedures described are intended to be carried out by suitably trained and/or supervised personnel. The substances and procedures described may be injurious to health if adequate precautions are not taken. Each procedure refers only to its technical suitability and does not absolve the user from statutory obligations relating to health and safety.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 3483 gives a general introduction to BS 3483, which describes a range of methods for testing pigments. It also includes general information relating to matters common to all or many of the other Parts.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Contents and usage of BS 3483

BS 3483 provides methods for testing pigments and includes methods for evaluating performance.

Whether or not there is a product specification specifying a particular method of test, it is recommended that use be made, as far as is practicable, of the methods in BS 3483. For particular pigments, some variation in a method may be necessary and provision is made for such variations in the individual methods. Details of the variation will be stated in the product specification where this exists. It is essential that the variations are referred to, or detailed, in the test report.

NOTE Attention is drawn to the fact that new Parts are regularly included in BS 3483, often implementing corresponding ISO methods. BS 3483 does not, however, necessarily include all methods of test for pigments.

3 Definitions

For the purposes of this standard, the definitions given in BS 2015 apply.

4 Units

Numerical values in BS 3483 are normally expressed in the units of the International System of Units (SI) described in BS 5555 and BS 5775. In accordance with the decision of ISO/TC 35, BS 3483 uses the litre and its submultiples as the unit for liquid measure.

5 Apparatus and reagents

Use volumetric glass apparatus complying with the appropriate British Standards.

NOTE 1 Other apparatus should wherever possible, comply, with an appropriate British Standard.

Use reagents of recognized analytical grade, unless otherwise specified in the individual Part.

NOTE 2 Suitable specifications for a number of reagents are given in BS 6376.

Use distilled or demineralized water wherever water is specified (see BS 3978).

NOTE 3 Water complying with grade 3 of BS 3978 is usually satisfactory.

6 Test report

When referring to the use of a test method, it is necessary to quote the full reference by giving the number of this British Standard, the method designation and date, e.g. BS 3483-XX:1990.

The test conditions specified in BS 3483 have often been adopted on an arbitrary basis and, if they are not strictly observed, the test results are liable to be affected. If the test conditions are varied for any reason, it is essential that the details of the variation(s) are stated in the test report (see also clauses **7** and **8**).

7 Standard atmospheres and temperatures for conditioning and testing

The properties of paints and paint coatings may alter considerably with changes in temperature and relative humidity during the period prior to and during testing. It is usually necessary to condition coated panels before testing, in order to improve the reproducibility of test results.

If appropriate, the test method specifies the conditioning procedure. The standard atmospheres and temperatures for conditioning and testing given in Appendix A are to be used whenever possible. For consistency of testing for national and International Standards, Appendix A is identical with ISO 3270.

Special atmospheres applicable to a particular test or paint or simulating a particular climatic environment are not included in Appendix A.

8 Alternative preferred test temperatures

Where it is necessary to carry out tests at temperatures different from those indicated in clause **7**, temperatures are to be selected from those given in Appendix B. These temperatures have been agreed internationally in ISO 3205.

Alternative temperatures other than those given in Appendix B are to be used only when this is considered essential for technical reasons.

Appendix A Atmospheres and temperatures for conditioning and testing

NOTE This appendix is identical, except for the addition of A as a prefix to the clause numbers, with ISO 3270:1984 "*Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*".

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as Appendix A of this Part of BS 3483 without deviation. Some terminology and certain conventions are not identical with those used in the British Standards, attention is drawn especially to the following.

Wherever the words "International Standard" appear, referring to this appendix, they should be read as "appendix".

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Cross-reference. There is no corresponding British Standard to ISO 558 "*Conditioning and testing — Standard atmospheres — Definitons*" referred to in **A.3** ISO 558 is, however, referred to for information only, so the validity of this appendix is not affected.

When making reference in a test report to the test atmosphere, "ISO 3270" should be replaced by "BS 3483-0, Appendix A", the latter being identical.

A.0 Introduction

The physical and mechanical properties of paints, varnishes and their raw materials are generally dependent on the test environmental conditions, the most important variables being temperature and humidity.

The degree to which each of these variables needs to be controlled is determined by the significance of the effect of the variable on the property being measured. Thus for measurement of viscosity, refractive index and density, it is essential to specifiy and control the temperature of the test portion to much closer limits than those required for the conditioning and testing atmosphere (see the note to **A.4.2**).

It is recognized that many data on, for example, viscosity, flow times and density have been determined, historically, at temperatures different from that specified in this International Standard. In order to preserve the validity of such data and since much laboratory apparatus (for example, burettes, pipettes, pyknometers) is not calibrated at 23 °C, specific deviation from this International Standard may be necessary.

It is strongly recommended that in these cases physical data should also be determined at the conditions specified in this International Standard in order to facilitate a progressive move towards general adoption of the standard conditons at some future date.

A.1 Scope and field of application

This International Standard specifies conditions of temperature and relative humidity for general use in the conditioning and testing of paints and varnishes and their raw materials. It is applicable to paints and varnishes in liquid or powder form, to wet or dry films, and their raw materials.

A.2 Reference

ISO 558, *Conditioning and testing — Standard atmospheres — Definitions.*

A.3 Definitions (derived from ISO 558)

A.3.1
conditioning atmoshphere

the atmosphere in which a sample or test piece is kept before being subjected to test. It is characterized by specified values for either one or both parameters: temperature and relative humidity, which are kept within the prescribed tolerances for a given period of time. The selected values and period of time depend on the nature of the sample or test piece to be tested

NOTE 1 The term "conditioning" refers to the operation as a whole designed to bring a sample or test piece, before testing, into a specified condition in relation to temperature and humidity, by keeping it for a given period of time in the conditioning atmosphere.

NOTE 2 The conditioning can be done either in the laboratory or in a special enclosure termed "the conditioning chamber" or in the test chamber.

A.3.2
test atmosphere

the atmosphere to which a sample or test piece is exposed throughout the test. It is characterized by specified values for either one or both parameters: temperature and relative humidity, which are kept within the prescribed tolerances

NOTE The test may be carried out either in the laboratory or in a special chamber termed "the test chamber", or in the conditioning chamber, the choice depending on the nature of the sample or test piece and on the test itself. For example, close control of the test atmosphere may not be necessary if the change of properties of the sample or test piece is significant in the test period.

A.4 Temperatures and humidities for conditioning and testing

A.4.1 ***Standard conditions*** (to be used whenever possible)

23 ± 2 °C and 50 ± 5 % relative humidity.

A.4.2 ***Standard temperature***

23 ± 2 °C and ambient relative humidity.

NOTE For some tests the limits for control of temperature are more strict. For example when determining viscosity or consistency, control limits of at most ± 0,5 °C are recommended.

A.4.3 ***Other conditions***

A.4.3.1 For countries where the standard conditions of **A.4.1** and **A.4.2** are difficult to maintain, and for other than referee purposes, other conditions may be specified, and these shall be noted in the test report.

A.4.3.2 Ambient conditions, where neither the temperature nor relative humidity have to be controlled, but these conditions, if known, should be noted in the test report.

A.5 Conditioning

A.5.1 The period of conditioning shall be as specified in the particular test method under consideration.

A.5.2 The products to be tested shall be placed in the conditioning atmosphere so that they reach equilibrium with the atmosphere as soon as possible. The relevant parts of the apparatus shall also be placed in the conditioning atmosphere so that they reach equilibrium. The products shall be protected from direct sunlight and the atmosphere should be clean.

Test panels shall be separated from each other and from the walls of the enclosure by a distance of at least 20 mm.

A.6 Testing

Unless otherwise specified, the products shall be tested under the same conditions as those in which they have been conditioned.

If the standard conditions, specified in **A.4.1**, have been used for conditioning and testing, the test report shall state:

Conditioned, for . . . h, and tested under the standard conditions conforming to ISO 3270.

If the standard conditions specified in **A.4.1** have not been used, but other conditions have been chosen, the test report shall state those conditions.

Appendix B Alternative preferred test temperatures

NOTE This appendix is identical, except for the addition of B as a prefix to the clause numbers, with ISO 3205:1976 "*Preferred test temperatures*".

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as Appendix B of this Part of BS 3483 without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

Wherever the words "International Standard" appear referring to this appendix, they should be read as "appendix".

Cross-reference. There is no corresponding British Standard to ISO 554 "*Standard atmospheres for conditioning and/or testing — Specifications*", referred to in **B.2.1** and **B.3**. ISO 554 is, however, referred to for information only, so the validity of this appendix is not affected.

B.1 Scope and field of application

This International Standard specifies preferred temperatures for use in testing.

The aim of this International Standard is to rationalize, harmonize and simplify the choice of temperatures in the future.

In drawing up test methods and specification, the temperatures chosen should, as far as possible, be taken from these preferred temperatures. It is permissible nevertheless to use other temperatures when this is considered essential for technical reasons.

A list of additional temperatures taken from international technical documents is given in an Annex. These temperatures either represent existing practice or are chosen to meet particular technical needs. It is hoped for the future that consideration will be given to using the temperatures given in the lists in clause **B.2** as far as technical considerations permit when revising international documents.

If no technical suitable temperature exists in the lists in clause **B.2**, consideration should next be given to temperatures in related fields in the list in the Annex.

B.2 Preferred temperatures

B.2.1 Temperatures of standard atmospheres for conditioning and/or testing (according to ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*)

23 °C

27 °C

20 °C

NOTE The temperature of the standard atmosphere for conditioning and/or testing, recommended in temperate countries is 23 °C; the temperature of 27 °C is chiefly used in tropical and subtropical countries and the temperature of 20 °C is used only in particular fields.
Further specifications are given in ISO 554.

B.2.2 Preferred test temperatures (in addition to the temperatures of the standard atmospheres for conditioning and/or testing, see **B.2.1**).

Degrees Celsius	
– 269	see note 1
– 196	
– 161	
– 70	
– 55	
– 40	
– 25	
– 10	
0	see note 2
+ 5	
25	
40	
55	
70	
85	
100	see note 2
105	
125	
150	
175	
200	
225	
250	
275	
300	
350	
400	
450	
500	
600	
700	
800	
900	
1 000	

NOTE 1 Below – 75 °C, the temperatures are fixed in terms of the boiling point of pure substances at ambient pressure (helium, nitrogen, methane).

NOTE 2 The choice between 0 °C and + 5 °C, or between 100 °C and 105 °C, may depend on whether the change of state of water is important in the particular test concerned.

B.3 Tolerances

In the absence of special provisions, particularly concerning closer tolerances, the following tolerances should be used:

Below – 75 °C, the tolerances depend essentially on the equipment used.

From – 75 °C to 1 000 °C, the tolerances are given in the adjacent table.

In general, these tolerances are sufficient. However, closer or, exceptionally, wider tolerances may be specified.

For the temperatures of standard atmospheres for conditioning and/or testing, ISO 554 specifies an ordinary tolerance of ± 2 °C and a reduced tolerance of ± 1 °C.

Temperatures °C	Tolerances °C
$-75 \leqslant \theta < 0$	± 3
$0 \leqslant \theta \leqslant 105$	± 2
$105 < \theta \leqslant 200$	± 3
$200 < \theta \leqslant 400$	± 5
$400 < \theta \leqslant 750$	± 10
$750 < \theta \leqslant 1\,000$	± 15

Annex List of temperatures used in particular fields

Degrees Celsius
– 65
– 62
– 54
– 50
– 35
– 20
– 18
+ 2
10
15
30
37
38
45
50
60
80
90
120
130
140
155
160
180
190
220
230
315
320
630
750
950

These temperatures are taken from documents prepared by the following ISO Technical Committees: TC 6 – 17 – 20 – 35 – 38 – 45 – 61 – 71 – 77 – 106 – 122 and by the following Committees of the IEC: 15 – 50.

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Publications referred to

BS 2015, *Glossary of paint terms.*

BS 3978, *Specification for water for laboratory use.*

BS 5555, *Specification for SI units and recommendations for the use of their multiples and of certain other units.*

BS 5775, *Specification for quantities, units and symbols.*

BS 6376, *Reagents for chemical analysis.*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications.*

ISO 558, *Conditioning and testing — Standard atmospheres — Definitions.*

ISO 3205, *Preferred test temperatures.*

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing.*

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