BRITISH STANDARD

BS 3484-2: 1994

Record inks —

Part 2: Specification for permanent inks

UDC 667.45

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Paper and Printing Standards Policy Committee (PAM/-) to Technical Committee PAM/27 upon which the following bodies were represented:

Association of Metropolitan Authorities
British Office Systems and Stationery Federation
HMSO
Public Record Office
Scottish Record Office
Society of Archivists
Society of Dyers and Colourists
Writing Instruments Association

This British Standard, having been prepared under the direction of the Paper and Printing Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 January 1994

The following BSI references relate to the work on this standard:
Committee reference PAM/27
Draft for comment 92/49152 DC

ISBN 0 580 22716 2

Amendments issued since publication

Amd. No.	Date	Comments

Contents

Foreword

This Part of BS 3484 has been prepared under the direction of the Paper and Printing Standards Policy Committee.

This specification calls for the use of a test procedure that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves the user of this standard from statutory obligations relating to health and safety at any stage of manufacture or use. In particular, attention is drawn to the lightfastness test in Annex A.

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 4, 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 3484 specifies performance and marking for inks which are applied by nib-type pens or another application medium, e.g. roller ball pens, and which are intended for documents which may have a very long working and storage life. Annex A gives details of tests for compliance of the ink with this Part of this British Standard.

NOTE 1 The long-term durability of any document also depends on the composition of the paper on which it is written, storage conditions, etc.

NOTE 2 Although security features can be introduced into writing inks, making the resulting script more difficult to alter, the producer of the original document may wish to consider the use of specially formulated background printing inks. These, used singly or in combination, will make alteration more difficult.

2 Normative references

This Part of BS 3484 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 3484 only when incorporated in it by updating or revision.

3 Definition

For the purposes of this Part of BS 3484, the following definition applies.

permanent record inks

inks suitable for creating records which are required to be preserved for long periods of time and which possess a high degree of resistance to eradication

4 Performance

When tested in accordance with the methods described in Annex A the ink shall:

a) show no strike through;

b) be visually recognizable as being of its original colour when tested in accordance with **A.4.2**;

c) show resistance to fading not less than equivalent to that of blue wool number 5, grey scale number 4, when tested in accordance with **A.4.3**;

d) show sufficient resistance to physical erasure such that, when tested in accordance with **A.4.4**, a definite line still exists;

e) show sufficient resistance to chemical eradication such that, when tested in accordance with **A.4.5**, a definite line still exists.

5 Marking

Each bottle or container of permanent record ink or package of writing instruments containing permanent record ink shall be legibly marked with the following information:

a) the name, trade mark or other means of identifying the manufacturer;

b) the date or date code of manufacture;

c) the number and date of this British Standard, i.e. BS 3484-2:1994[1)].

[1)] Marking BS 3484-2:1994 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Annex A (normative) Determination of ink performance

A.1 Apparatus

A.1.1 *Write test machine*[2], capable of holding the appropriate writing instrument and of drawing a continuous spiral line (see Figure A.1) of 10 cm circumference in a rotating motion about the longitudinal axis of the writing instrument.

A.1.2 *Test paper*[3], with characteristics as given in Table A.1.

A.2 Procedure

A.2.1 *General*

Carry out the test piece preparation in the standard atmosphere specified in BS EN 20187:1993 and then follow the procedure of either **A.2.2** or **A.2.3**.

A.2.2 *Write test machine*

Load the write test machine (**A.1.1**) with the appropriate paper (**A.1.2**) for the ink to be tested and adjust the machine to give a writing pattern of a continuous spiral line 10 cm in circumference.

Set the machine in motion and produce the continuous test pattern for a length of 105 m.

Condition the test length in the standard atmospheric conditions for 24 h.

A.2.3 *Manual method*

Using the ink in a writing instrument recommended by the ink manufacturer, draw lines of a total length of at least 30 m on the paper specified for liquid ink pens in **A.1.2**.

Condition the test length in the standard atmospheric conditions for 24 h.

A.3 Visual examination

A.3.1 *General*

The first 5 m of writing shall be discarded and the examinations as given in **A.3.2** and **A.3.3** shall be carried out on the remainder.

A.3.2 *Ink deposition*

When examined the test length shall show a consistent quality of line.

A.3.3 *Strike through*

There shall be no ink visible on the underside of the test length when examined.

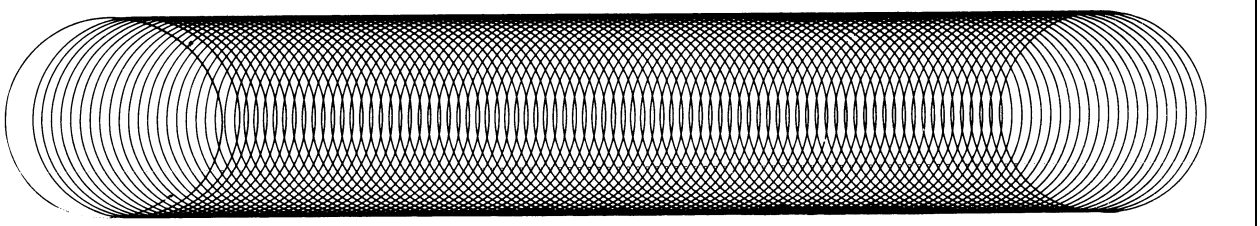

Figure A.1 — Example of machine test writing

Table A.1 — Characteristics of test paper

Property	Liquid ink pens	Ballpoint pens	Test method
Grammage, g/m^2	70 ± 10	80 ± 5	BS 3432:1980
Thickness, µm	80 ± 10	80 ± 5	BS 3983:1989
Cobb value, g/m^2 (topside)	25 ± 10	25 ± 10	BS 2644:1991
Ash %	6.5 ± 2.5	8.0 ± 1.0	BS 3631:1984
Roughness, µm	4.5 ± 0.6	2.85 ± 0.35	BS 6563:1985
pH	5.0 to 7.5	5.0 to 8.0	BS 2924-1:1983
Colour	White	White	—

[2] Minitek or Hutt machines have been found suitable.
[3] Information on the source of suitable paper can be obtained from Customer Services, Information, BSI, Linford Wood, Milton Keynes MK14 6LE.

A.4 Physical evaluation

A.4.1 *General*

Cut the strip of test writing into six pieces each the width of the test writing plus a margin not greater than 3 mm on each side and approximately 135 mm in length. Carry out the following tests.

A.4.2 *Fastness to water*

Immerse a test piece in a shallow dish of appropriate size, for example a petri dish, and add the minimum quantity of water to just cover the test piece. Cover the dish and leave at room temperature for 24 h. At the end of this period examine the water and the test piece for signs of ink migration. Dry the test piece and compare its colour with the original in light conditions conforming to BS 950-1:1967.

A.4.3 *Lightfastness*

Take one test piece and expose to light for 48 h in accordance with BS EN 20105-B02:1993. At the end of this period the resistance to fading shall be at least equivalent to blue wool number 5, grey scale number 4, when examined in light conditions conforming to BS 950-1:1967.

A.4.4 *Resistance to physical erasure*

Take two test pieces and abrade each manually with a glass filled eraser until the surface of the paper is just visibly damaged. Examine the ink trace.

A.4.5 *Resistance to chemical eradication*

To one test piece apply drops of the solutions listed below. After 10 min blot off with lint-free absorbent paper or cotton wool and allow to dry. Visual examination with the unaided eye shall not show any loss of ink integrity.

a) 50 % *v*/*v* aqueous solution of ethanol (C_2H_5OH).

b) 10 % *v*/*v* aqueous solution of hydrochloric acid (HCl).

c) 10 % *m*/*m* aqueous solution of sodium hydroxide (NaOH).

d) 2 % *m*/*m* aqueous solution of chloramine T.

e) *Bleaching solution*. A slightly ammoniacal solution of 6 % hydrogen peroxide (20 volume H_2O_2) achieved by adding a few drops of 0,880 ammonia solution, until the first appearance of bubbles.

NOTE This is equivalent to approximately 0.25 ml of ammonia solution per 10 ml of hydrogen peroxide solution.

blank

List of references (see clause 2)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 950, *Specification for artificial daylight for the assessment of colour.*

BS 950-1:1967, *Illuminant for colour matching and colour appraisal.*

BS 2644:1991, *Method for determination of water absorptiveness of paper and board (Cobb method).*

BS 2924, *Aqueous extracts of paper, board and pulp.*

BS 2924-1:1983, *Method for determination of pH.*

BS EN 20105, *Textiles — Tests for colour fastness.*

BS EN 20105-B02:1993, *Colour fastness to artificial light (xenon arc fading lamp test).*

BS EN 20187:1993, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples.*

BS 3432:1980, *Method for determination of grammage of paper and board.*

BS 3631:1984, *Method for determination of ash of paper and board.*

BS 3983:1989, *Method for determination of thickness and apparent bulk density or apparent sheet density of paper or board.*

BS 6563:1985, *Method for determination of the roughness of paper and board by the Parker Print-surf apparatus.*

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL