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Specification for

Short-range short-stem thermometers

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Laboratory Apparatus Standards Policy Committee (LBC/-) to Technical Committee LBC/4, upon which the following bodies were represented:

- British Laboratory Ware Association
- British Medical Association
- Department of Health
- Department of Trade and Industry (National Physical Laboratory)
- Institute of Petroleum
- Medical Sterile Products Association
- Scientific Glassware Association

This British Standard, having been prepared under the direction of the Laboratory Apparatus Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 May 1990

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Type and designation	1
3 Temperature scale	1
4 Bulb	1
5 Stem	1
6 Annealing	1
7 Stabilization	1
8 Graduation and figuring	1
9 Immersion line	1
10 Expansion volume	4
11 Finish	4
12 Enlargements of the bore	4
13 Dimensions of scale ranges	4
14 Marking	4
Appendix A Emergent liquid column temperatures for partial immersion thermometers	5
Appendix B Testing of thermometers	5
Appendix C Thermometric glasses approved by the National Physical Laboratory	5
Appendix D Stabilization test	6
Figure 1 — Examples of scale lines and figuring	2
Table 1 — Graduation, figuring and general dimensions	2
Table 2 — Scale ranges and tolerances	3
Table 3 — Recommended limits of uncertainty of test	6
Table 4 — Identification stripe(s) or approved abbreviations and normal maximum working temperature of all glasses that have been approved for the manufacture of thermometer bulbs	7
Publication referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Laboratory Apparatus Standards Policy Committee, and supersedes BS 1365:1975 which is withdrawn.

This British Standard was first published in 1951 to meet the requirements for thermometers of the Anschutz and similar types, i.e. with comparatively short stems and graduated to cover scale spans of approximately 60 °C (series A) and 10 °C (series B).

The first revision in 1975 introduced a more open scale for both series A and B thermometers to facilitate reading without loss of accuracy and a greater permissible error for series A thermometers. An appendix on emergent liquid column temperature correction (Appendix A) was added for use with thermometers under partial immersion conditions.

This revision introduces changes to bring the standard up to date and in particular to modify the information on available glasses and arrangements for calibration and testing but retains the other requirements of the 1975 edition.

Series A refers to a series of overlapping short-range thermometers which collectively cover a range of – 10 °C to + 360 °C.

Series B refers to a series of overlapping short-stem thermometers which collectively cover a range of – 10 °C to + 220 °C.

Series B thermometers are recommended for use in determining melting points and setting points.

Information on the testing of short-range short-stem thermometers is given in Appendix B.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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 8, 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 British Standard specifies requirements for two series, A and B, of mercury-in-glass thermometers. In each series, thermometers calibrated for total immersion, i.e. immersion to the reading (designated A1 or B1) and thermometers calibrated for partial immersion (designated A2 or B2) are included for each temperature range.

Series A1 comprises seven total immersion thermometers, each with a scale span of approximately 60 Celsius degrees, covering the range $-10\text{ }^{\circ}\text{C}$ to $+360\text{ }^{\circ}\text{C}$.

Series A2 covers the same range for an immersion of 80 mm.

Series B1 comprises 24 total immersion thermometers, each with a scale span of approximately 10 Celsius degrees, covering the range $-10\text{ }^{\circ}\text{C}$ to $+220\text{ }^{\circ}\text{C}$.

Series B2 covers the same range for an immersion of 70 mm.

NOTE The title of the publication referred to in this standard is listed on the inside back cover.

2 Type and designation

Thermometers shall be of the mercury-in-glass solid-stem type and shall be filled with inert gas at an appropriate pressure. Each thermometer shall be designated by a designation consisting of the code letters SA or SB (for short-range series A or B respectively), followed by a nominal maximum working temperature and an indication of the immersion depth at which the thermometer is to be used, e.g. SA 55C/Total, SB IC/70.

3 Temperature scale

Thermometers shall be graduated in accordance with the Celsius scale as defined in the current definition of the International Practical Temperature Scale adopted by the General Conference of Weights and Measures (CGPM).

4 Bulb

The bulb shall be cylindrical and in alignment with the stem. Its external diameter shall not exceed that of the stem. It shall be of a thermometric glass approved by the National Physical Laboratory and suitable for the range of temperature covered (see Appendix C).

5 Stem

For thermometers in which the upper level of the scale is above $300\text{ }^{\circ}\text{C}$, the same thermometric glass shall be used for both the bulb and the stem.

NOTE For thermometers in which the upper level of the scale is $300\text{ }^{\circ}\text{C}$ or less, it is recommended that the stem should be made of the same thermometric glass as the bulb but it is also permissible for the stem to be made of lead glass or other suitable glass with an enamel back.

6 Annealing

Strain in the glass shall be reduced to a level sufficient to minimize the possibility of fracture due to mechanical or thermal shock.

7 Stabilization

The thermometer shall be stabilized before graduation using a process such that, when tested in accordance with Appendix D, the maximum error and maximum change in error over any interval of the finished thermometer is within the limits specified in Table 2 and the rise at the selected reference point is not greater than the maximum error allowed.

8 Graduation and figuring

The scale lines shall be clearly etched or otherwise durably marked, and of uniform thickness. The lines shall lie in planes at right angles to the axis of the thermometer. When the thermometer is held in a vertical position, and viewed from the front, the left-hand ends of all the scale lines shall lie on an imaginary vertical line.

NOTE When the thermometer is held in a vertical position and viewed from the front, the figures may be either horizontal or vertical, provided all are clearly visible.

The figures shall be placed so that they would be intersected by the line to which they refer if the lines were extended.

When the thermometer is viewed such that the right-hand ends of the shortest lines denoting the smallest interval are aligned with the left-hand side of the bore (see Figure 1), then the medium and long lines shall extend across the bore towards the right. The lengths of the scale lines shall be in accordance with Table 1.

9 Immersion line

In partial immersion thermometers, a line shall be permanently marked on the stem at the point to which the thermometer is intended to be immersed. If the immersion point is below the lowest scale line, the immersion line shall be a ring carried completely round the stem. If the immersion point is above the lowest scale line, the immersion line shall be confined to the back of the stem.

The depth of immersion shall be within $\pm 1\text{ mm}$ of the value specified in the appropriate table and shall be measured from the bottom of the bulb.