AS 2819—1985

Australian Standard®

THERMOMETERS—METEOROLOGICAL—MAXIMUM, MINIMUM AND ORDINARY

This Australian Standard was prepared by Committee CH/1, Laboratory Glasses and Related Apparatus and completed by Committee CH/30, Temperature Measurement. It was approved on behalf of the Council of the Standards Association of Australia on 3 July 1985 and published on 6 September 1985.

The following interests are represented on Committee CH/1:

Confederation of Australian Industry
CSIRO, Division of Applied Physics
Department of Agriculture, N.S.W.
Department of Health (Commonwealth)
Department of Science (Commonwealth)
Government Chemical Laboratories, W.A.
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Australian Institute of Physics
Australian Scientific Industry Association
CSIRO, Division of Applied Physics,
Confederation of Australian Industry Association
Department of Science (Commonwealth)
National Association of Testing Authorities, Australia

This Standard was issued in draft form for comment as DR 84037.

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First published (as AS R13) 1966
AS 2819 first published 1985

Incorporating:
Amdt 1—1985

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 3878 3

PREFACE

This standard was initially prepared by the Association's Committee on Laboratory Glassware and Related Apparatus and finalised by the new committee on Temperature Measurement. It supersedes AS R13—1966, Maximum, Minimum and Ordinary Meteorological Thermometers.

AS R13 was based largely on the Commonwealth Bureau of Meteorology Equipment Specification No A 410, Issue 2 (April 1962) for Meteorological Thermometers—Ordinary, Maximum and Minimum. It also took account of BS 692 (1958)—Meteorological Thermometers. This revision has been undertaken in order to update the specification and to remove all reference to the Fahrenheit scale of temperature measurement.

There was some uncertainty about the adequacy of clauses specifying (a) the 'permanence' of pigment filling on the thermometer scale and (b) the corrosion resistance of metal fixtures holding thermometers to their backing. The addition of an accelerated weathering test, which could also be combined with other tests (see Clause 3.1), overcomes the uncertainty. Any stricter specifications remain the subject of contractual arrangements between interested parties.

CONTENTS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for the design, construction and testing of—

(a) sheathed,
(b) unsheathed and
(c) backed

maximum, minimum and ordinary meteorological thermometers and their mountings.

1.2 APPLICATION. This standard applies to thermometers suitable for meteorological use, primarily in a louvred screen.

1.3 DESIGNATION. Thermometers considered in this standard may be mounted or unmounted and shall comprise the following:

Maximum..... mercury-in-glass, evacuated, and graduated on the stem

Minimum..... spirit-in-glass, graduated on the stem

Ordinary..... mercury-in-glass, graduated on the stem

1.4 REFERENCED DOCUMENTS. The follow standards are referred to in this standard:

AS 1199 Sampling Procedures and Tables for Inspection by Attributes

AS 1399 Guide to AS 1199, Sampling Procedures and Tables for Inspections by Attributes

AS 1580 Methods of Test for Paints and Related Materials
Method 452.1 Resistance to Humidity under Condensation Conditions

AS 1821-23 Suppliers Quality Control Systems, Levels 1, 2 and 3

AS 2000 Guide to AS 1821-1823, Suppliers Quality Control Systems

AS 2433 Plastics—Method for Exposure to Ultraviolet Lamps

AS 2543 Nomenclature of Australian Timbers

AS K121 Ethanol (BS 507:1966 endorsed without amendment)

1.5 DEFINITIONS. For the purpose of this standard the following definitions apply:

1.5.1 Complete immersion—the condition when the entire thermometer is immersed in the medium whose temperature is being measured.

1.5.2 Free fall—the descent of a body (in this case, the index) moving solely under the influence of gravity (See Appendix B).

1.5.3 Index—a device designed to fit into the bore of a minimum thermometer and to move freely in one direction with the meniscus of the liquid contained in the thermometer and to then remain, until the thermometer is reset, in a position which will indicate the minimum temperature to which the thermometer has been exposed since the previous setting.

1.5.4 Permanent marking—designated markings, specifically those of a pigment or filler, which resist erasure when the marked item (e.g. thermometer or mounting) is exposed to the test conditions specified in Appendix D of this standard.

NOTE: This definition is intended to clarify the term as applied to thermometers exposed to conditions which attempt to simulate meteorological applications of these thermometers.

1.5.5 Retraction—the movement of the index essentially under the influence of the surface tension of the liquid contained in a minimum thermometer (see Appendix B).

1.5.6 Retreat—the undesirable withdrawal, with decreasing temperature, of the mercury column of a maximum thermometer through a constriction in the bore of the thermometer (see Appendix A).

1.5.7 Shake down—the ability of the mercury column of a maximum thermometer to return through a constriction in the bore during the action of shaking down. This action is carried out when the thermometer is being reset (see Appendix A).

1.5.8 Thermometer—an instrument for ascertaining the temperature of a fluid.

NOTE: Temperatures are measured in terms of the Common wealth legal units of measurement of temperature which in this case are Celsius degrees as defined in the Weights and Measures (National Standards) Regulations, in force under the Weights and Measures (National Standards) Act 1960-1966.

1.5.9 Throw over ('run forward')—any increase in the reading of a maximum thermometer as a result of its rotation from 88 degrees to 60 degrees from the vertical position as distinct from the normal increase due to hydrostatic effects (see Appendix A).

1.6 RANGE. The range of the thermometers shall be in accordance with the appropriate requirements of Table 1.1.

TABLE 1.1
RANGE OF METEOROLOGICAL THERMOMETERS

Type of Thermometer	Range
Maximum	–20°C to 60°C
Minimum	–30°C to 50°C
Ordinary	–20°C to 60°C –40°C to 40°C

1.7 PACKAGING. Thermometers shall be packaged individually in a substantial container of appropriate size. Packaging shall be such that the thermometer will not be damaged under normal conditions of transit and storage.

1.8 IDENTIFICATION MARKING.

1.8.1 Thermometer. The stem of the thermometer shall be permanently marked with the following information which shall be readily legible when viewed from the front:

(a) Manufacturer's name or mark.
(b) Year of manufacture.
(c) Scale, i.e. 'C' denoting Celsius.
(d) Serial number.
(e) The type of thermometer, i.e. 'Max', 'Min', 'Ord'.