

International Standard



1770

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Solid-stem general purpose thermometers

Thermomètres sur tige d'usage général

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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 1770 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in September 1979.

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

Australia	Hungary	Romania
Brazil	India	South Africa, Rep. of
Canada	Italy	Spain
Czechoslovakia	Korea, Rep. of	United Kingdom
France	Libyan Arab Jamahiriya	USA
Germany, F.R.	Poland	USSR

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 1770-1970, of which it constitutes a technical revision.

Solid-stem general purpose thermometers

0 Introduction

Although the thermometers covered by this International Standard are not intended for use in any specific test method, the overall lengths of the series of higher accuracy are specified with a tolerance so as to provide a degree of interchangeability for any special apparatus into which the thermometers are incorporated.

For ease of reference, each thermometer has been allocated a designation consisting of a single letter representing the range of the thermometer and the indication "TOTAL" or, for example, "75" relating to the intended immersion.

Some of the thermometers described in the scope and field of application of this International Standard, and which are in current use, are of a lower quality than those strictly covered in ISO 386. Accordingly, whilst this International Standard is based on the provisions of ISO 386, it does not align with those which recommend the distance between consecutive scale lines to be greater than 0,8 mm and the maximum error to be one scale division. In order to avoid increasing the cost of the thermometers, some of the dimensions recommended to be specified in ISO 386 have also been omitted.

1 Scope and field of application

This International Standard specifies requirements for two series of inexpensive "commercial quality" liquid-in-glass thermometers of the solid-stem type suitable for general purpose use in industry, schools and laboratories when great accuracy of measurement is not required :

- a) a series designated A to H, in which nominal ranges and maximum overall lengths are specified but which may not be acceptable for testing by a national verification laboratory;
- b) a series designated J to W of greater accuracy than in a) and with specified ranges and a tolerance on overall length, which may be acceptable for testing by a national verification laboratory.

The temperature range covered by each series is from $-100\text{ }^{\circ}\text{C}$ to $+500\text{ }^{\circ}\text{C}$.

2 Reference

ISO 386, *Liquid-in-glass laboratory thermometers — Principles of design, construction and use*.

3 Temperature scale

The thermometers shall be graduated in accordance with the Celsius scale as defined in the current definition of the International Practical Temperature Scale (IPTS) adopted by the Conférence générale des poids et mesures, and in accordance with the International System of Units (SI).

4 Immersion

4.1 The thermometers shall be adjusted for use either at total immersion (i.e. the reading shall be correct when the thermometer is immersed so that the top of the liquid column is in the same plane as, or no more than two scale divisions above, the surface of the medium the temperature of which is required to be measured), or for partial immersion, as required.

4.2 In the latter case, the preferred immersion is $75 \pm 1\text{ mm}$, and the adjustment of such a thermometer shall be carried out at the average emergent liquid column temperature detailed in tables 1 and 2.

NOTES

- 1 Adjustment at partial immersion is not permitted for the thermometers with a scale extending below $-38\text{ }^{\circ}\text{C}$, because of the large errors likely to be caused in a spirit-in-glass thermometer by variations in temperature around the emergent portion of the stem.
- 2 For guidance on the determination of the emergent liquid column corrections to be applied when the thermometer is used in situations where the average emergent liquid column temperature differs from that given in tables 1 and 2, see annex B.6 and B.7 of ISO 386.

5 Glass

The thermometer bulb shall be made of suitable thermometric glass.¹⁾ The glass or glasses comprising the thermometer shall

1) An International Standard (ISO 4795) dealing with glasses for thermometer bulbs is in preparation.