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Clinical glass thermometers with
maximum device

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Health, Labour and Welfare and the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS T 4206**:2014 is replaced with this Standard.

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Clinical glass thermometers with maximum device

Introduction

Annex A and Annex B of this Japanese Industrial Standard specify technical standards, verification, methods for in-service inspections, etc. regarding the construction and performance among the requirements for clinical glass thermometers, which are specified measuring instruments subject to constraints on transfer or the like based on Article 57 of the Measurement Act; however, compliance only with these annexes does not necessarily mean that the thermometers pass the verification specified in the Measurement Act.

Furthermore, Annex C describes the method for handling clinical glass thermometers in which mercury is sealed as temperature-sensitive liquid and which are produced and imported based on **JIS T 4206:2014**, the previous edition. From December 31, 2020, production of clinical glass thermometers with mercury sealed as temperature-sensitive liquid will be prohibited based on the Act on Preventing Environmental Pollution of Mercury (Act No. 42 of 2015), and the import will be prohibited based on the Import Trade Control Order (Cabinet Order No. 414 of 1949). However, their use is unregulated, and these thermometers will continue to be used or disposed of in the future. Accordingly, points of attention are provided in Annex C.

1 Scope

This Standard specifies clinical glass thermometers for measuring human body temperatures (hereafter referred to as thermometers). This Standard is applicable to thermometers having the following functions and construction:

- a) thermometers having a stop point and a sealed liquid metal other than mercury as temperature-sensitive liquid;
- b) thermometers the measuring unit of which is degree Celsius or centigrade (°C).

Annex A and Annex B are applied to the thermometers which are specified measuring instruments under the Measurement Act.

WARNING Persons carrying out tests based on this Standard should be familiar with normal laboratory practice. This Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices.

NOTE : For thermometers in which mercury is sealed as temperature-sensitive liquid and which are produced and imported until December 31, 2020, **JIS T 4206:2014** applies.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 1604 *Platinum resistance thermometers*

JIS Z 8103 *Glossary of terms used in measurement*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS Z 8103**, and the following apply.

3.1 stop point

narrowed part of a capillary tube so that the temperature-sensitive liquid in the capillary tube is retained at the position of the maximum temperature measured, even after the temperature decreases

3.2 capillary tube

thin tube where a sealed temperature-sensitive liquid goes up or down

3.3 temperature-sensitive liquid

liquid sealed in the bulb of a thermometer for indicating a temperature in the capillary tube according to the degree of expansion corresponding to the temperature

3.4 break in the liquid column

state where temperature-sensitive liquid in a capillary tube breaks off due to air bubbles or the like

3.5 measured value

value of a physical property of an object or physical phenomenon, quantified by a measuring instrument

3.6 secular change

state where a value measured for the same temperature by a thermometer changes with the lapse of time

3.7 instrumental error

value obtained by subtracting a true value from a measured value

3.8 scale mark

numeral, dot, line or other symbols used to indicate a measured value or its relevant value

3.9 scale spacing

centre-to-centre length between two adjacent scale marks

3.10 scale interval

difference between the adjacent scale marks, each of which represents the physical quantity (temperatures) of an object or physical phenomenon

3.11 ovulation index

basic index for a basal body temperature used in the medical field, i.e. a value obtained by dividing the temperature range from 35.5 °C to 38 °C into fifty (50) equal parts (0 ov to 50 ov)

4 Classification

Thermometers shall be classified according to the construction and intended use, and shall be as specified in Table 1 and Table 2.

Table 1 Classification by construction

Classification	Construction
Flat type	Thermometers with a capillary tube and scale plate being sealed in an outer tube (see Figure 1)
Rod type	Thermometers with a capillary tube on which a scale is marked directly (see Figure 2)

Table 2 Classification by intended use

Classification	Intended use
For general purposes	Being used for measuring body temperatures for ordinary purposes
For ladies	Being used for measuring basal body temperatures of ladies

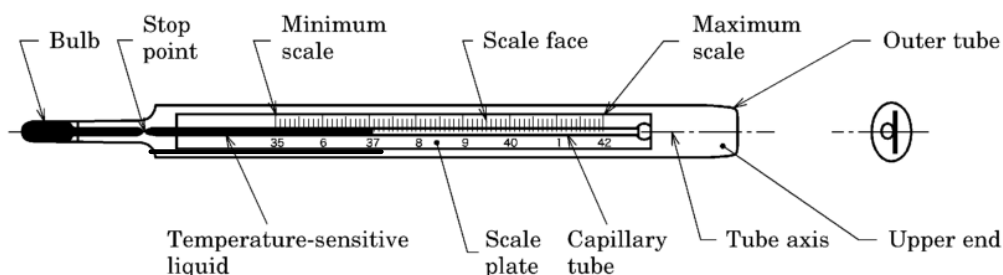


Figure 1 Flat type

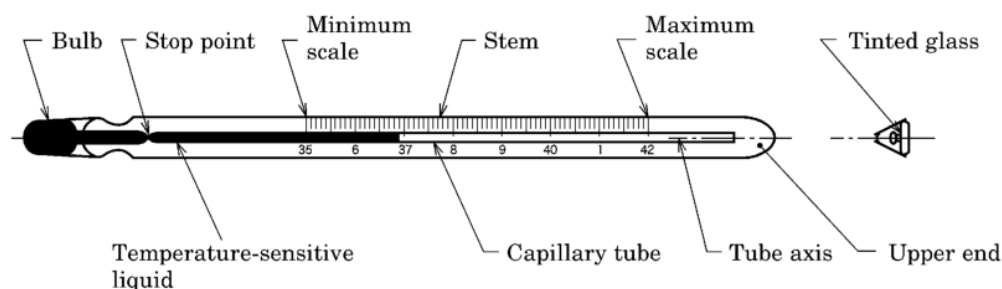


Figure 2 Rod type

5 Materials

5.1 Glass

Glass shall be as follows:

- a) materials less likely to experience a secular change shall be used;
- b) materials satisfying the following condition shall be used: When tested according to **7.2**, the quantity of alkali elution is 0.7 mg or less per 2.5 g of a glass powder specimen.

5.2 Temperature-sensitive liquid The temperature-sensitive liquid shall not contain any impurities¹⁾ which may impede thermometers from functioning correctly.

Note ¹⁾ When the temperature-sensitive liquid is an alloy, the term “impurities” means any metals not intended to be mixed.

5.3 Scale plate The scale plate shall be made of materials which are stable and less likely to change.

6 Performance

6.1 Maximum permissible error

When the instrumental error test specified in **7.1** is carried out, the maximum permissible error shall be ± 0.1 °C for thermometers for general purposes and ± 0.05 °C for those for ladies.

6.2 Scale

The scale shall be as follows.

- a) The scale shall be graduated so that the temperature is indicated by the centre of the thickness of each graduation line.
- b) The temperature measuring range shall include 35 °C to 42 °C for thermometers for general purposes and 35.5 °C to 38 °C for those for ladies.
- c) The scale interval shall be 0.1 °C for thermometers for general purposes and 0.05 °C for those for ladies.
- d) The scale spacing shall not be less than 0.5 mm.
- e) The thickness of a graduation line shall not exceed one-third of the scale spacing. However, graduation lines showing multiples of 0.5 °C for thermometers for general purposes and 0.25 °C for those for ladies may have the thickness of a half or less of the scale spacing.
- f) The graduation lines shall be perpendicular to the tube axis of the thermometer.
- g) Main graduation lines shall be marked with a temperature that the line indicates or its numerical value. For thermometers for ladies, an ovulation index may be marked together.