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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

JY/T 0441-2011

**Teaching glass instruments with test tubes
(English Translation)**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

Please note that some elements of this standard may involve patents. The issuer of this standard should not be held responsible for identifying these patents.

This standard was proposed by the National Technical Committee for Standardization of

Teaching Instruments (SAC/TC125).

This standard is under the jurisdiction of the National Technical Committee for Standardization of Teaching Instruments (SAC/TC125).

This standard was drafted. Sichuan Longchang Glass Instrument Factory, Zhejiang Educational Technology Center, Sichuan Ziyang Glass Instrument Factory, Sichuan Scientific industry teaching equipment limited liability company.

1 Scope

This standard specifies the classification and naming of test tubes, technical requirements, test methods, inspection rules, packaging, transportation, and storage.

This standard applies to test tubes for teaching aids.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this document.

For undated references, the latest version (including all amendments) applies to this document.

GB 191-2008 packaging storage and transportation pictogram GB/T 2828.1-2003 Counting sampling acceptance procedure Part 1. Sampling plan for batch inspection for retrieval by acceptance quality limit (AQL) JY 0001-2003 General quality requirements for teaching instruments and equipment products JY 0002 Inspection rules for teaching instruments and equipment products JY 0026-1991 teaching instrument and teaching equipment product model naming method JY/T 0423-2011 General quality requirements and test methods of teaching glass instruments

3.1 Product Classification

Divided into different specifications according to diameter and length, according to the position of the branch tube is divided into mouth with branch test tube and bottom with branch test tube.

3.2 Model designation

The model name of the product should comply with the provisions of JY 0026-1991.

Models with test tubes are named.

L - JZG - K/D - 15 x 150 Product specifications (diameter x length), unit. mm Product feature code, with mouth support/bottom support Product name Pinyin prefix with test tube Product model classification code, glass instrument Model example.

L-JZG-K-15 x 150. Supported test tube with mouth size of 15mm x 150mm.

4.1 Materials

It should be made of colorless transparent borosilicate glass. The average linear thermal expansion coefficient is not more than $4.0 \times 10^{-6} \text{K}^{-1}$.

4.2 Dimensions

The external dimensions and tolerances of the test tubes with various specifications at the mouth should conform to Table 1, Figure 1, and the specifications and appearance of the test tubes with various specifications at the bottom Dimensions and tolerances should conform to Table 2 and Figure 2.

Table 1 Dimensions and tolerances of test tubes with various specifications for mouth

No.	Specifications	Test tube length L	Tube outer diameter D	Branch tube outer diameter D1	Branch tube length l1	Branch to nozzle Distance l2	Wall thickness S
1	phi 15 x 150	150 ± 5.0	15 ± 1.0	8 ± 1.0	35 ± 5.0	18 ± 3.0	≥0.8
2	phi 18 x 150	150 ± 5.0	18 ± 1.0	8 ± 1.0	35 ± 5.0	22 ± 3.0	≥0.9
3	phi 21 x 180	180 ± 5.0	21 ± 1.0	8 ± 1.0	35 ± 5.0	25 ± 3.0	≥1.0
4	phi 25 x.200.200	200 ± 5.0	25 ± 1.5	8 ± 1.0	40 ± 5.0	30 ± 3.0	≥1.0
5	phi 32 x.200.200	200 ± 5.0	32 ± 2.0	8 ± 1.0	40 ± 5.0	38 ± 3.0	≥1.2

Table 2 Dimensions and tolerances of test tubes with various specifications at the bottom in millimeters

No.	Specifications	Test tube length L	Test tube outer diameter D	Branch tube outer diameter D1	Branch tube length l1	Wall thickness S
1	phi 18 x 150	150 ± 5.0	18 ± 1.0	8 ± 1.0	40 ± 5.0	≥0.9
2	phi 21 x 180	180 ± 5.0	21 ± 1.0	8 ± 1.0	45 ± 5.0	≥1.0
3	phi 25 x.200.200	200 ± 5.0	25 ± 1.5	8 ± 1.0	50 ± 5.0	≥1.0

Figure 1 Test tube with mouth

Figure 2 Test tube at the bottom

4.3 Appearance

4.3.1

The appearance defects allowed are to comply with B.7 of Appendix B of JY/T 0423-2011.

4.3.2

The appearance defects that should not exist shall be in accordance with JY/T 0423-2011 Section 5.1.1.

4.3.3

Oral treatment should comply with JY/T 0423-2011 Section 5.3.

4.3.4

The thickness of the bottom of the pipe shall be uniform, and the thickness difference shall not be greater than 0.2mm, and shall comply with Article 5.4 of JY/T 0423-2011.

4.3.5

The branch pipe connection should be smooth and firm, and should not be skewed.

4.4 Chemical stability

Should meet water resistance HGB level 1, acid resistance H1 level, alkali resistance A2 level.

4.5 Internal stress

The internal stress should not be greater than 180 nm/cm.

4.6 Thermal shock

Thermal shock should not be lower than 180 °C

4.7 Environmental test

The environmental test shall be in accordance with Chapter 8 of JY/T 0423-2011.

5 Test method

5.1

The average linear thermal expansion coefficient shall be in accordance with JY/T 0423-2011 Section 6.4.2. The test shall meet the requirements of 4.1 of this standard.

5.2

External dimensions shall be measured with a vernier caliper of 0.02 mm and a steel ruler with a graduation value of 0.5 mm, which shall meet the requirements of 4.2 of this standard. Exterior the length of the defect is tested with a reading microscope. Should meet the corresponding requirements of this standard.

5.3

The wall thickness and uniformity shall be tested in accordance with JY/T 0423-2011 Section 4.1.2, and shall comply with 4.2 and 4.3.4 of this standard.

5.4

Water resistance, acid resistance and alkali resistance are tested according to Article 6.5.2 of JY/T 0423-2011 and shall meet the requirements of Article 4.4 of this standard.