International Standard 7713

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Laboratory glassware — Disposable serological pipettes

Verrerie de laboratoire — Pipettes sérologiques à usage unique

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Foreword

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Laboratory glassware — Disposable serological pipettes

1 Scope and field of application

This International Standard specifies requirements for disposable glass serological pipettes adjusted to deliver — including blow-out pipettes — suitable for general laboratory purposes. The details specified are in conformity with ISO 8417.

2 References

ISO 719, *Glass — Hydrolytic resistance of glass grains at* 98 °C *— Method of test and classification.* [1)]

ISO 1769, *Laboratory glassware — Pipettes — Colour coding.*

ISO 3534, *Statistics — Vocabulary and symbols.*

ISO 8417, *Laboratory volumetric instruments — Disposable volumetric articles — Principles of design and construction.* [2)]

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 disposable serological pipette: A serological pipette intended to be used once only and then discarded.

NOTE — Such pipettes will only be expected to provide their specified performance during the original operation.

3.2 accuracy (of a pipette): The closeness of agreement between the nominal volume and the mean volume, obtained by applying the test procedure specified in clause 9. It is quantified by the inaccuracy of the mean.

3.3 repeatability (of a pipette): The closeness of agreement between the individual volumes obtained by applying the test procedure specified in clause 9. It is quantified by the imprecision.

NOTE — The definitions for "accuracy" and "repeatability" apply only in the cases where the distributions are Gaussian.

4 Basis of adjustment

4.1 Unit of volume

The unit of volume is the cubic centimetre (cm^3), for which the name millilitre (ml) may be used.

NOTE — The term millilitre (ml) is commonly used as a special name for the cubic centimetre (cm^3), in accordance with the International System of Units (SI).

4.2 Reference temperature

The reference temperature, i.e. the temperature at which the pipette is intended to deliver its nominal volume (nominal capacity), is 20 °C.

NOTE — If the pipette is required for use in a country which has adopted a reference temperature of 27 °C (the alternative specified in ISO 8417 for tropical use), this value shall be substituted for 20 °C.

5 Dimensions, delivery times

The dimensions and delivery times shall be as shown in the table.

The delivery time shall be determined with the pipette unplugged, and with distilled water at a temperature of 20 °C.

1) At present at the stage of draft. (Revision of ISO 719-1981.)

2) At present at the stage of draft.

Table — Capacity, subdivision, dimensions and delivery time

Nominal capacity ml	Smallest scale division ml	Lowest graduation line at ml	External diameter[1] mm	Wall thickness min. mm	Delivery times min. s	Delivery times max. s
0,1	0,01	0,09	3,5 to 4	1	0,5	3
0,2	0,01	0,18	3,5 to 4,5	1	0,5	3
0,5	0,01	0,45	4,25 to 4,75	0,6	0,5	3
1	0,01	0,9	4,25 to 4,75	0,6	0,5	5
1	0,1	0,9	4,25 to 4,75	0,6	0,5	5
2	0,01	1,9	5 to 6	0,6	0,5	5
5	0,1	4,5	7 to 8,25	0,6	3	10
10	0,1	9	9,5 to 11,25	0,6	4,5	15

1) Graduated part.

6 Construction

6.1 Material

The pipettes shall be made of glass. When tested in accordance with the procedure and using the classification laid down in ISO 719, the glass shall comply with the requirements of class HGB 3 or better.

The glass shall be free from visible defects and from internal stress which would impair the performance of the pipette.

6.2 Graduation and figuring

The pipettes shall be provided with a graduation according to ISO 8417, and figured accordingly.

Graduation and figuring shall be durable until the pipette has been used.

The pipettes shall be graduated from 0 at the top down to the lowest graduation line according to the table. The distance between the top of the pipette and zero line shall be at least 90 mm.

6.3 Workmanship

6.3.1 Pipettes shall be straight. Any cross-section of a pipette taken in a plane perpendicular to the longitudinal axis shall be reasonably circular.

6.3.2 The pipettes shall be free from foreign matter, loose or embedded lint, from chips that affect the bore and from stains when viewed under normal room lighting.

6.3.3 The lower end of the pipette shall terminate in a delivery jet having a smooth and gradual taper without any sudden constriction at the orifice which could give rise to turbulent outflow.

The end of the jet shall be smoothly ground square with the axis, slightly bevelled on the outside and fire-polished.

The length of the tapered portion shall be

— 10 to 25 mm for capacities up to 2 ml inclusive;

— 15 to 30 mm for the 5 ml and 10 ml sizes.

6.3.4 The 10 ml pipette shall have a suction end tooled to an external diameter from 7 to 9 mm and an overall length from 15 to 25 mm. Alternatively, the 10 ml suction end shall be the unreduced diameter of the pipette with a constriction located between 15 and 25 mm from the top. Whether tooled or constricted, the suction end shall be dimensionally suitable for plugging with filtering material. All suction ends shall be reasonably perpendicular to the longitudinal axis of the pipette, and shall be fire-polished.

7 Volumetric performance

When tested in accordance with clause 9, the accuracy and repeatability shall be within the limits stated by the manufacturer.

8 Definition of capacity

8.1 Setting of the meniscus

8.1.1 Set the meniscus so that the plane of the upper edge of the graduation line is horizontally tangential to the lowest point of the meniscus, the line of sight being in the same plane.

8.1.2 In order that the lowest point of the meniscus may be observed, place a shade of some dark material immediately below and behind the meniscus. This renders the profile of the meniscus dark and clearly visible against a light background.

8.2 Flow-out pipettes

The capacity corresponding to any graduation line is defined as the volume of water at 20 °C, expressed in millilitres, delivered by the pipette at 20 °C when emptied from the zero line to that