
International Standard



835/3

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Laboratory glassware — Graduated pipettes — Part 3 : Pipettes for which a waiting time of 15 s is specified

Verrerie de laboratoire — Pipettes graduées — Partie 3 : Pipettes avec temps d'attente de 15 s

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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 835/3 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in August 1979.

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

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Brazil	Germany, F.R.	Poland
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Czechoslovakia	Korea, Rep. of	United Kingdom
Egypt, Arab Rep. of	Libyan Arab Jamahiriya	USSR
France	Mexico	

The member body of the following country expressed disapproval of the document on technical grounds :

South Africa, Rep. of

This International Standard cancels and replaces ISO Recommendation R 835-1968, of which it constitutes a technical revision.

Laboratory glassware — Graduated pipettes — Part 3 : Pipettes for which a waiting time of 15 s is specified

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1 Scope and field of application

This part of ISO 835 specifies requirements for an internationally acceptable series of graduated pipettes with comparatively large jets, for which a waiting time of 15 s is specified in order to compensate for the possible effect of shorter delivery times, and which are adequate for general laboratory purposes. They are adjusted to class A accuracy.

The details specified are in conformity with ISO 384 and ISO 835/1.

NOTE — Particular requirements for graduated pipettes, for which no waiting time is required, are specified in ISO 835/2, and for blow-out pipettes in ISO 835/4.

2 References

ISO 384, *Laboratory glassware — Principles of design and construction of volumetric glassware.*

ISO 835/1, *Laboratory glassware — Graduated pipettes — Part 1 : General requirements.*

3 Requirements for graduated pipettes

Unless otherwise stated in this International Standard graduated pipettes shall conform to the general requirements specified in ISO 835/1.

3.1 Requirements for pipettes, with which 15 s waiting time are to be observed

3.1.1 Definition of capacity

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 graduation line, the outflow being interrupted when the meniscus has come to a few millimetres above the graduation line; final setting is made to the graduation line after a waiting time of 15 s.

In the case of delivery of the total capacity to the jet, the outflow shall also be unrestricted and a waiting time of 15 s shall be observed before removing the pipette from the receiving vessel.

NOTE — Where, exceptionally, the standard reference temperature is 27 °C, this value shall be substituted for 20 °C.

The clean pipette shall be held in a vertical position and filled with distilled water to a few millimetres above the zero line; the falling meniscus shall then be set to the line. Any drop adhering to the jet of the pipette shall be removed by bringing the surface of a glass vessel into contact with the tip of the jet.

Delivery shall then be made into another glass vessel slightly inclined so that the tip of the jet is in contact with the inside of the vessel, but without movement of one against the other throughout the delivery and waiting periods.

3.1.2 Graduation and figuring

3.1.2.1 Graduation pattern 2 (see ISO 835/1) shall be applied (see the figure).

3.1.2.2 Lowest and lowest figured graduation lines shall be in accordance with table 1.

Table 1 — Lower end of scale

Nominal capacity	ml	0,5	1	2	5	10	25
Lowest figured graduation line	ml	0,4	0,9	1,8	4,5	8	23
Lowest graduation line	ml	0,45	0,9	1,8	4,5	8,5	23,2

NOTE — These figures are calculated taking into account the requirement that 10 mm of uniform bore shall lie below lowest graduation line.

3.1.3 Delivery times

When the delivery time is marked on a pipette, then the observed delivery time and the marked delivery time shall both be within the limits given in table 2 and shall not differ by more than 2 s.

Table 2 — Delivery times

Nominal capacity	Delivery times	
	min.	max.
ml	s	s
0,5	2	8
1	2	8
2	2	8
5	5	11
10	5	11
25	9	15

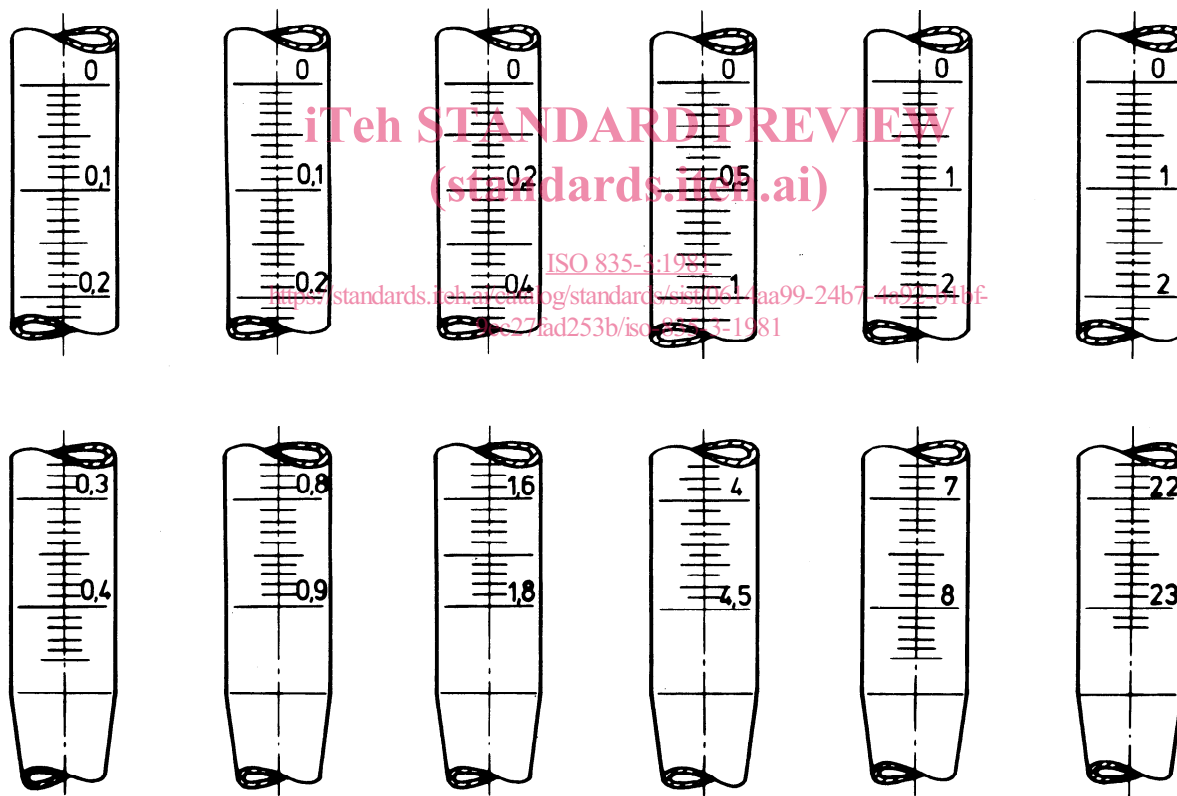


Figure — Graduation and figuring