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Standard Specification for Laboratory Glass Beakers[1]

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1. Scope

1.1 This specification provides standard dimensional requirements for glass beakers suitable for general laboratory use.

NOTE 1—For packaging standards, choose among the following standards: Specification E920; Specification E921, Practice E1133. For sampling and testing refer to Specification E1157.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E438 Specification for Glasses in Laboratory Apparatus

E671 Specification for Maximum Permissible Thermal Residual Stress in Annealed Glass Laboratory Apparatus

E920 Specification for Commercially Packaged Laboratory Apparatus

E921 Specification for Export Packaged Laboratory Apparatus

E1133 Practice for Performance Testing of Packaged Laboratory Apparatus for United States Government Procurements

E1157 Specification for Sampling and Testing of Reusable Laboratory Glassware

3. Classification

3.1 Beakers shall be in the following types and sizes.

3.1.1 *Type I*—Low form with spout (Griffin):

3.1.1.1 *Size 1*—10 cm^3,

3.1.1.2 *Size 2*—20 cm^3,

3.1.1.3 *Size 3*—30 cm^3,

3.1.1.4 *Size 4*—50 cm^3,

3.1.1.5 *Size 5*—100 cm^3,

3.1.1.6 *Size 6*—150 cm^3,

3.1.1.7 *Size 7*—250 cm^3,

3.1.1.8 *Size 8*—400 cm^3,

3.1.1.9 *Size 9*—600 cm^3,

3.1.1.10 *Size 10*—800 cm^3,

3.1.1.11 *Size 11*—1000 cm^3,

3.1.1.12 *Size 12*—1500 cm^3,

3.1.1.13 *Size 13*—2000 cm^3,

3.1.1.14 *Size 14*—3000 cm^3, and

3.1.1.15 *Size 15*—4000 cm^3.

3.1.2 *Type II*—Low form, with spout, heavy duty:

3.1.2.1 *Size 1*—150 cm^3,

3.1.2.2 *Size 2*—250 cm^3,

3.1.2.3 *Size 3*—400 cm^3,

3.1.2.4 *Size 4*—600 cm^3,

3.1.2.5 *Size 5*—1000 cm^3,

3.1.2.6 *Size 6*—2000 cm^3, and

3.1.2.7 *Size 7*—4000 cm^3.

3.1.3 *Type III*—Tall form, with spout (Berzelius):

3.1.3.1 *Size 1*—100 cm^3,

3.1.3.2 *Size 2*—200 cm^3,

3.1.3.3 *Size 3*—300 cm^3,

3.1.3.4 *Size 4*—400 cm^3,

3.1.3.5 *Size 5*—500 cm^3,

3.1.3.6 *Size 6*—600 cm^3, and

3.1.3.7 *Size 7*—1000 cm^3.

3.1.4 *Type IV*—Tall form, without spout (Berzilius):

3.1.4.1 *Size 1*—100 cm^3,

3.1.4.2 *Size 2*—200 cm^3,

3.1.4.3 *Size 3*—300 cm^3,

3.1.4.4 *Size 4*—400 cm^3, and

3.1.4.5 *Size 5*—500 cm^3.

3.1.4.6 *Size 6*—600 cm^3, and

3.1.4.7 *Size 7*—1000 cm^3.

3.1.5 *Type V*—Electrolytic, without spout:

3.1.5.1 *Size 1*—180 cm^3, and

3.1.5.2 *Size 2*—250 cm^3.

NOTE 2—The term millilitre (mL) is commonly used as a special name for the cubic centimeter (cm^3) and similarly the liter (L) for 1 000 cubic centimeters, in accordance with the International System of Units (SI).

4. Material and Annealing

4.1 Beakers shall be made of borosilicate glass conforming to the requirement of Type I, Class A of Specification E438.

[1] This specification is under the jurisdiction of ASTM Committee E41 on Laboratory Apparatusand is the direct responsibility of Subcommittee E41.01 on Apparatus.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4.2 Maximum residual thermal stress shall be such as to conform to Specification E671.

5. Design

5.1 Types I and II beakers shall be constructed to have straight sides (the 1 000 through 4 000 cm^3sizes may have slightly tapered sides). Types III and IV beakers shall have slightly tapered sides (the 100 and 200 cm^3may be straight sided). Type V beakers may have slightly tapered or straight sides.

5.2 All styles may have a slightly concave bottom. The junction of the sides with the bottom shall be well rounded.

5.3 The beakers shall be symmetrically made and smoothly finished, the upper edge with a fire polished bead and may be flared outward. Type II beakers may have a tooled flare.

5.4 Types I, II and III beakers shall have well defined spouts such that the stream of water poured from the lip of the beaker shall pour evenly, and shall not cling to the outside of the beaker and flow off the bottom when tilting the nearly full beaker at a 45° angle.

6. Capacity and Dimensions

6.1 Beakers shall conform to the requirements of Table 1, Table 2, Table 3, and Table 4.

TABLE 4 Capacity and Dimensions of Type V Beakers

Size	Capacity, cm^3	Max. Body OD, mm	Max Height, mm
1	180	52	120
2	250	60	135

7. Markings

7.1 Each beaker shall be permanently marked with the name or known trademark of the manufacturer and the nominal capacity, as well as approximate graduation mark-ings that have a limit of error of ±5 % of full capacity. The graduation intervals shall comply with the tables.

7.2 There shall be an area on one side of the beaker, roughened by sand blasting or suitably decorated to provide for marking with pencil.

8. Keywords

8.1 beakers; glass; laboratory

TABLE 1 Capacity and Dimensions of Type I Beakers

Size	Capacity, cm^3	Body OD, mm	Max Height, mm	Min Graduated Range, cm^3	Max Graduated Subdivision, cm^3
1	10	25 ± 2	35	...	...
2	20	32 ± 2	45	5 to 15	10
3	30	35 ± 2	55	5 to 25	10
4	50	41 ± 2	60	10 to 40	10
5	100	50 ± 2	75	20 to 80	10
6	150	57 ± 2	90	20 to 140	20
7	250	68 ± 2	100	25 to 200	25
8	400	77 ± 2	120	50 to 325	25
9	600	88 ± 3	135	100 to 500	50
10	800	98 ± 3	145	100 to 750	50
11	1 000	108 ± 3	160	100 to 900	50
12	1 500	120 ± 3	180	200 to 1 400	200
13	2 000	130 ± 3	200	200 to 1 800	200
14	3 000	146 ± 3	225	250 to 2 500	250
15	4 000	161 ± 4	260	500 to 3 500	500