



Standard Specification for Laboratory Glass Beakers¹

This standard is issued under the fixed designation E960; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

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 cm³,
- 3.1.1.2 *Size 2*—20 cm³,
- 3.1.1.3 *Size 3*—30 cm³,
- 3.1.1.4 *Size 4*—50 cm³,
- 3.1.1.5 *Size 5*—100 cm³,

- 3.1.1.6 *Size 6*—150 cm³,
- 3.1.1.7 *Size 7*—250 cm³,
- 3.1.1.8 *Size 8*—400 cm³,
- 3.1.1.9 *Size 9*—600 cm³,
- 3.1.1.10 *Size 10*—800 cm³,
- 3.1.1.11 *Size 11*—1000 cm³,
- 3.1.1.12 *Size 12*—1500 cm³,
- 3.1.1.13 *Size 13*—2000 cm³,
- 3.1.1.14 *Size 14*—3000 cm³, and
- 3.1.1.15 *Size 15*—4000 cm³.

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

- 3.1.2.1 *Size 1*—150 cm³,
- 3.1.2.2 *Size 2*—250 cm³,
- 3.1.2.3 *Size 3*—400 cm³,
- 3.1.2.4 *Size 4*—600 cm³,
- 3.1.2.5 *Size 5*—1000 cm³,
- 3.1.2.6 *Size 6*—2000 cm³, and
- 3.1.2.7 *Size 7*—4000 cm³.

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

- 3.1.3.1 *Size 1*—100 cm³,
- 3.1.3.2 *Size 2*—200 cm³,
- 3.1.3.3 *Size 3*—300 cm³,
- 3.1.3.4 *Size 4*—400 cm³,
- 3.1.3.5 *Size 5*—500 cm³,
- 3.1.3.6 *Size 6*—600 cm³, and
- 3.1.3.7 *Size 7*—1000 cm³.

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

- 3.1.4.1 *Size 1*—100 cm³,
- 3.1.4.2 *Size 2*—200 cm³,
- 3.1.4.3 *Size 3*—300 cm³,
- 3.1.4.4 *Size 4*—400 cm³, and
- 3.1.4.5 *Size 5*—500 cm³.
- 3.1.4.6 *Size 6*—600 cm³, and
- 3.1.4.7 *Size 7*—1000 cm³.

3.1.5 *Type V*—Electrolytic, without spout:

- 3.1.5.1 *Size 1*—180 cm³, and
- 3.1.5.2 *Size 2*—250 cm³.

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

Current edition approved Nov. 1, 2013. Published December 2013. Originally approved in 1983. Last previous edition approved in 2008 as E960 – 93 (2008). DOI: 10.1520/E0960-93R13.

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.

NOTE 2—The term millilitre (mL) is commonly used as a special name for the cubic centimeter (cm³) 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.

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 cm³ sizes may have slightly tapered sides). Types III and IV beakers shall have slightly tapered sides (the 100 and 200 cm³ may 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 markings 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

TABLE 2 Capacity and Dimensions of Type II Beakers

Size	Capacity, cm ³	Body OD, mm	Max Height, mm	Min Graduated Range, cm ³	Max Graduated Subdivision, cm ³
1	150	57 ± 2	90	20 to 140	20
2	250	67 ± 2	100	25 to 200	25
3	400	77 ± 2	120	50 to 325	25
4	600	88 ± 3	135	100 to 500	50
5	1 000	108 ± 3	160	100 to 900	50
6	1 200	130 ± 3	200	200 to 1 800	200
7	4 000	161 ± 4	260	500 to 3 500	500

TABLE 3 Capacity and Dimensions of Types III and IV Beakers

Size	Capacity, cm ³	Body OD, mm	Max Height, mm	Min Graduated Range, cm ³	Max Graduated Subdivision, cm ³
1	100	50 ± 2	85	20 to 80	10
2	200	56 ± 2	110	25 to 150	25
3	300	64 ± 2	125	25 to 250	25
4	400	70 ± 2	135	50 to 325	25
5	500	75 ± 2	145	100 to 400	50
6	600	80 ± 3	160	100 to 500	50
7	1 000	90 ± 3	195	100 to 900	50

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the ASTM website (www.astm.org/COPYRIGHT/).