



Standard Specification for Apparatus for Determination of Water by Distillation¹

This standard is issued under the fixed designation E123; 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 covers apparatus used in Test Method D95 and other similar ASTM test methods.

2. Referenced Documents

2.1 *ASTM Standards*:²

D95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation

3. Apparatus Assembly

3.1 Typical assemblies of the apparatus are shown in Fig. 1 and Fig. 2. The glass flask has been generally used for petroleum products, soaps, naval stores, etc., and the metal still for road materials and tars.

4. Glass Flask

4.1 The glass flask shall have nominal capacities of 500 mL or 1000 mL, as required, and shall be made of heat-resistant glass. Styles shall be as shown in Fig. 3 and Fig. 4 and as listed in the following table:

Style	Size, mL	Shape	Top Finish	Figure
A	500	round	with \$ joint	Fig. 3
B	500	round	with \$ joint	Fig. 3
C	1000	round	with \$ joint	Fig. 3
D	500	Erlenmeyer	with \$ joint	Fig. 4

5. Metal Still

5.1 The metal still shall have an approximate capacity of 1000 mL. It may be constructed of any suitable metal; but copper is recommended for the vessel, and copper or brass for the lid. Fig. 5 shows the essential dimensions and a satisfactory construction of vessel head and clamp. Other means of closure may be used that provide a tight seal of head to body.

6. Heater

6.1 Any suitable gas burner or electric heater may be used with the glass still. With the metal still, a ring gas burner, having an inside diameter of 4¼ in. (108 mm) with holes in the inside periphery should be used.

7. Condenser

7.1 The condenser shall be a Liebig or West straight type with a jacket not less than 400 mm long. Fig. 6 shows the general construction of suitable condensers.

8. Traps

8.1 The traps shall be of 5-mL, 10-mL, and 25-mL capacities. Six styles are provided as specified in Table 1 and shown in Figs. 7-11.

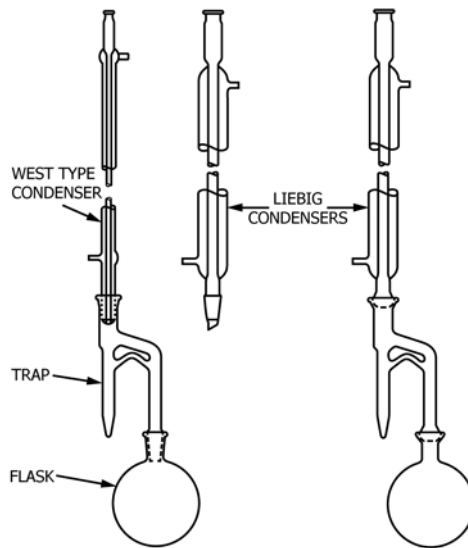
9. Keywords

9.1 apparatus; distillation

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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.



NOTE 1—Trap shall be 15 to 16 mm in inside diameter.
FIG. 1 Typical Assemblies with Glass Flask

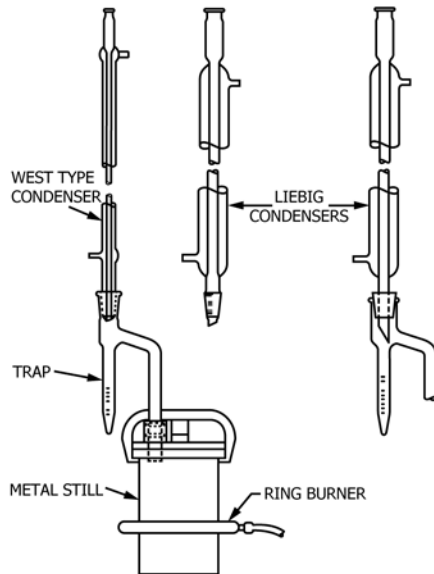
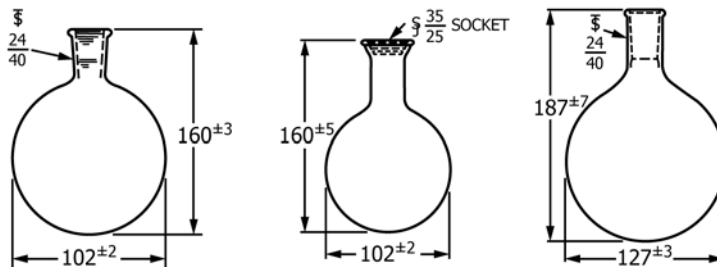


FIG. 2 Typical Assemblies with Metal Still



Note—All dimensions are in millimetres.
 A. 500 mL with Taper Joint. B. 500 mL with Ball-and-Socket Joint. C. 1000 mL with Taper Joint.

FIG. 3 Glass Flasks, Round-Bottom

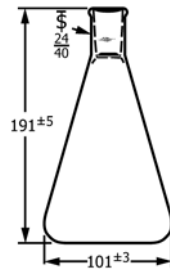


FIG. 4 Erlenmeyer Flask, 500-mL Capacity

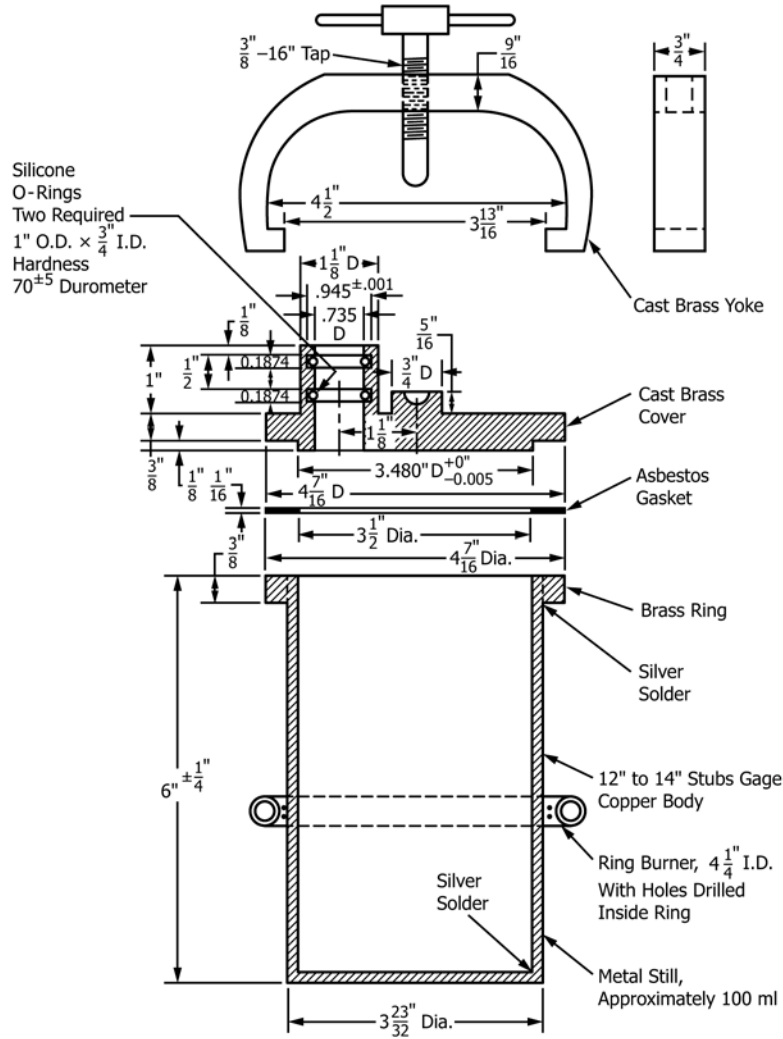
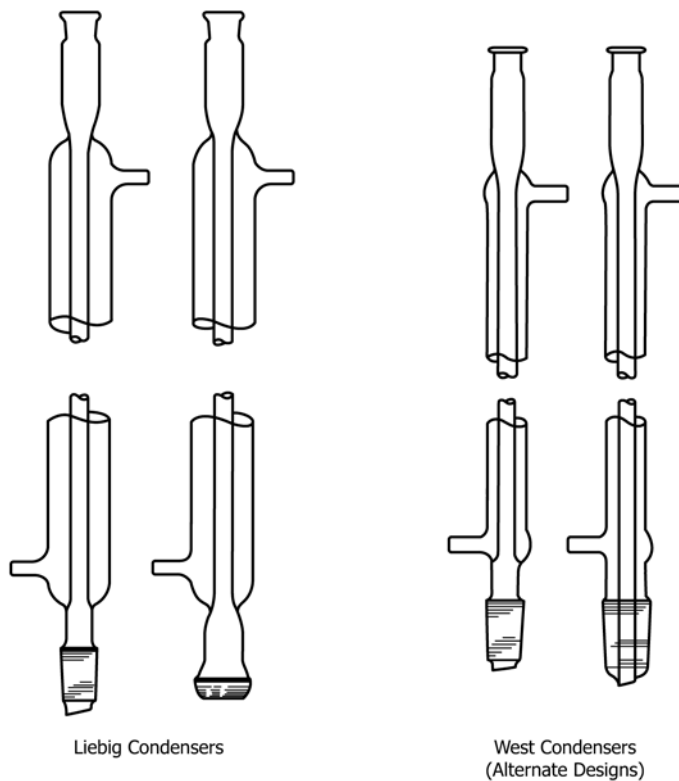


FIG. 5 Metal Still

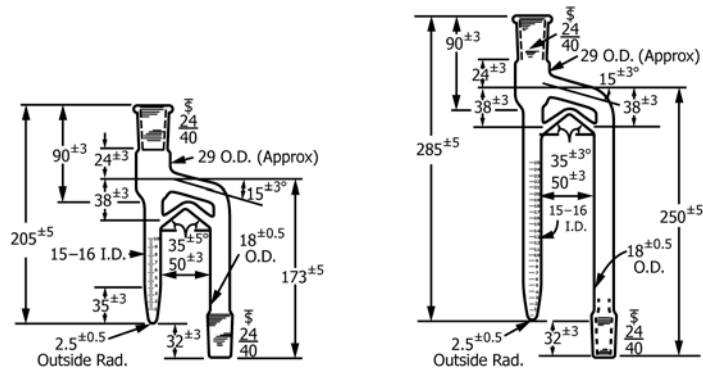


NOTE 1—Ends of connections to water supply and drain may vary in design. Connection may be on same or opposite sides of jacket.

FIG. 6 Condensers

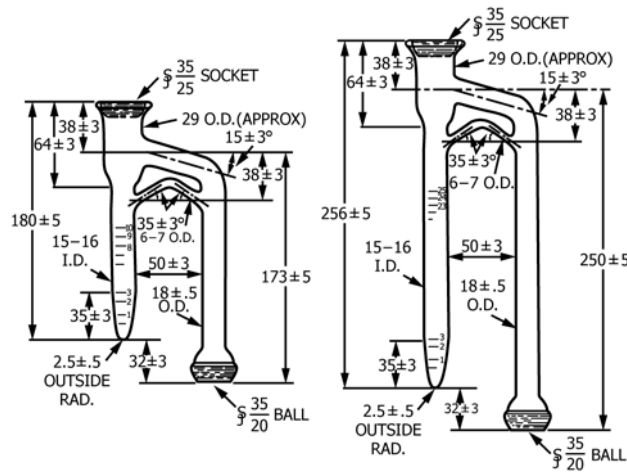
TABLE 1 Dimensions and Sizes of Traps

Style	Description			Figure	Size of Trap, mL	Range, mL	Smallest Scale Division, mL	Scale Error, max, mL
	Top of Graduated Tube	Bottom of Graduated Tube	Bottom of Vapor Tube					
A	§ joint	conical	§ joint	7	10	0 to 1.0 over 1.0 to 10.0	0.1 0.2	0.05 0.1
B	§ joint	conical	§ joint	8	25	0 to 1.0 over 1.0 to 25	0.1 0.2	0.05 0.1
C	§ joint	conical	plain	9				
D	plain	conical	plain	10				
E	§ joint	round	§ joint	11	5 10	0 to 5.0 0 to 10.0	0.1 0.1	0.05 0.1



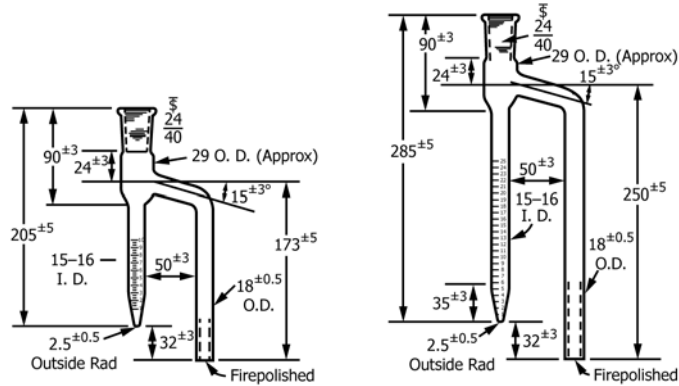
NOTE 1—All dimensions are in millimetres.

FIG. 7 Traps (Style A)



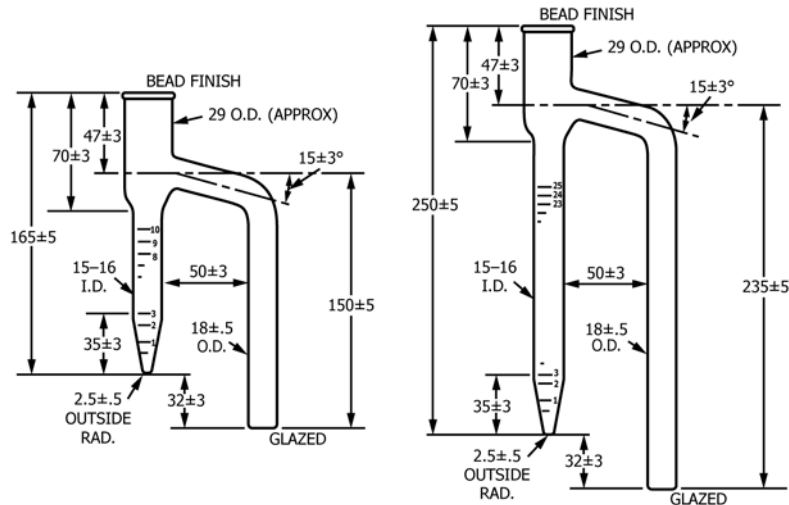
NOTE 1—All dimensions are in millimetres.

FIG. 8 Traps (Style B)



NOTE 1—All dimensions are in millimetres.

FIG. 9 Traps (Style C)



NOTE 1—All dimensions are in millimetres.

FIG. 10 Traps (Style D)

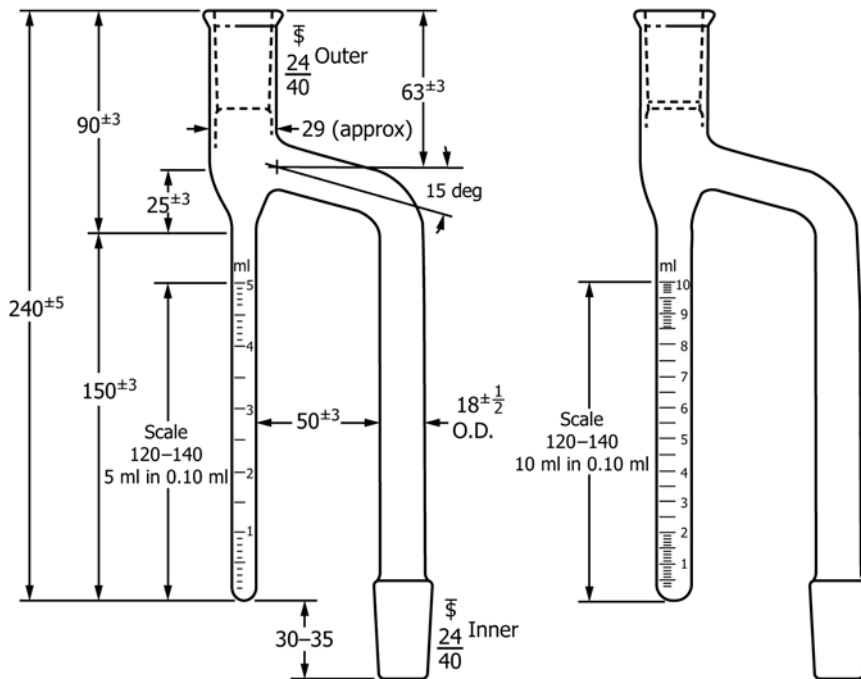


FIG. 11 Traps (Style E), 5-mL and 10-mL Capacities

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