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Specification for
Soxhlet extractors

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Laboratory Apparatus Standards Policy Committee (LBC/-) to Technical Committee LBC/25, upon which the following bodies were represented:

Association of Scientific, Technical and Managerial Staffs
 British Laboratory Ware Association
 Chemical Industries Association
 CLEAPSE
 Department of Health and Social Security
 Glass Manufacturers' Federation
 Institute of Medical Laboratory Sciences
 Institute of Science Technology
 Royal Society of Chemistry

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The following BSI references relate to the work on this standard:
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Foreword

This British Standard has been prepared under the direction of the Laboratory Standards Policy Committee and supersedes BS 2071:1968, which is withdrawn. BS 2071 was first published in 1954 and a first revision was issued in 1968 which extended the number of sizes specified in the 1954 edition. This 1989 revision retains the two types of extractor specified in the 1968 edition but adds a third type with a removable liner and syphon tube.

The sizes and proportions of the extractors have been selected to give a satisfactory performance in general laboratory use and it has been confirmed that suitable sizes of paper thimbles are commercially available. The specification of suitable sizes of flasks, condensers and extraction thimbles given in the 1968 edition is not now considered necessary but guidance on selection is given in Appendix A.

The specified bores (see Table 1 and Table 2) have been selected as the most satisfactory for use with a variety of solvents but it should be borne in mind that the performance of the extractor is affected by factors other than the dimensions and the solvent, such as temperature and rate of reflux.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for Soxhlet extractors suitable for general laboratory use.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Types and capacities

Three types of extractor are specified as follows.

- a) Type 1, with a syphon tube bent in a loop [see Figure 1(a) and Figure 1(b)].
- b) Type 2, with a concentric syphon tube [see Figure 2(a) and Figure 2(b)].
- c) Type 3, with a syphon tube bent in a loop and connected to a separate removable inner thimble holder (see Figure 3).

For types 1 and 2 the sizes specified are of nominal capacities 6 mL, 20 mL, 40 mL, 60 mL, 100 mL, 200 mL, 600 mL and 2 L (see Table 1).

For type 3 the sizes specified are of nominal capacities 20 mL, 50 mL and 100 mL (see Table 2).

The nominal capacity is intended to be that of the body of the extractor when filled to the overflow level of the syphon tube. This condition is satisfied when the extractors are made to the dimensions listed. Variations in capacity of up to about 15 % will occur depending on the tolerances shown.

3 Materials

The extractors shall be constructed from tubing of borosilicate glass complying with BS 5895.

NOTE The extractors should be as free as possible from visible defects and reasonably free from internal stress.

4 Dimensions

The dimensions of extractors shall be as given in Table 1 and Table 2. The conical joint sockets shall comply with BS 572.

5 Design and construction

The general design of the extractors shall be as shown in Figure 1 and Figure 2 for types 1 and 2 and as shown in Figure 3 for type 3.

NOTE 1 In the type 1 extractor the syphon tube and the vapour tube may be on opposite sides or on the same side as shown in Figure 1(a) and Figure 1(b) respectively.

The following specific detailed requirements shall be taken into account in the construction of the syphon tube and the vapour tube.

- a) The lower portion of the vapour tube shall slope downwards to ensure complete drainage.
- b) The entry of the syphon tube shall be sealed on in such a position that it ensures maximum drainage of the extractor.
- c) The lower portion of the syphon tube shall slope downwards to ensure complete drainage.
- d) In the type 1 extractor the syphon tube shall be close to the body of the extractor and the top portion shall be bent in a smooth loop without enlargement or undue construction.
- e) In the type 2 extractor the lower portion of the syphon tube shall be strengthened by additional wall thickness and increased size as indicated in Figure 2(a) and Figure 2(b).
- f) In the type 2 extractor of 2 L capacity the syphon tube shall be strengthened as shown in Figure 2(b) with a glass supporting collar positioned at approximately 230 mm up the tube and with spacing pips between the external and internal walls, one set at about 70 mm and the other set at about 200 mm along the tube.
- g) In the type 3 extractor each removable syphon tube shall be provided with integral support to centralize it and enable it to maintain clearance from the body of the vapour tube at its lower end.

NOTE 2 The support system's function is to ensure that the refluxing solvent is directed into the liner and to maintain the return tube in a vertical position.

6 Marking

Each extractor shall be permanently and legibly marked with the following information:

- a) the nominal capacity, e.g. 60 mL;
- b) the maker's or vendor's name or trademark;
- c) the appropriate joint sizes in accordance with BS 572;
- d) the number of this British Standard, i.e. BS 2071¹⁾.

¹⁾ Marking BS 2071 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Table 1 — Joint sizes and dimensions for types 1 and 2 Soxhlet extractors

Extractor features	Nominal capacity of extractor								
	6 mL	20 mL	40 mL	60 mL	100 mL		200 mL	600 mL	2 L
	mm	mm	mm	mm	mm	mm	mm	mm	mm
Socket joint size	19/26	24/29	29/32	34/35	34/35	40/38	50/42	^a	^a
Cone joint size	14/23	19/26	24/29	24/29	24/29	24/29	24/29	34/35	34/35
Body									
External diameter	18 ± 0.4	28 ± 0.5	34 ± 0.8	38 ± 0.8	38 ± 0.8	44 ± 1	56 ± 1	85 ± 1.8	115 ± 2
Wall thickness	1.8 ± 0.20	2 ± 0.2	2 ± 0.2	2 ± 0.2	2 ± 0.2	2.3 ± 0.3	2.5 ± 0.3	5.0 ± 0.6	6 ± 0.8
Siphon tube									
Internal diameter (inner tube only in type 2)	3.25 ± 0.25	3.25 ± 0.25	3.25 ± 0.25	3.25 ± 0.25	3.25 ± 0.25	3.25 ± 0.25	3.75 ± 0.25	3.75 ± 0.25	4.5 ± 0.25
Wall thickness, min.	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75
Annular separation between inner and outer tubes (type 2)	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5
Clearance at top in type 2	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25	1.25 ± 0.25
Vapour tube									
External diameter	10 ± 0.4	10 ± 0.4	10 ± 0.4	10 ± 0.4	10 ± 0.4	10 ± 0.4	11 ± 0.4	18 ± 0.4	18 ± 0.4
Wall thickness	1 ± 0.1	1 ± 0.1	1 ± 0.1	1 ± 0.1	1 ± 0.1	1 ± 0.1	1 ± 0.1	1.8 ± 0.2	1.8 ± 0.2
Dimensions shown in Figure 1 and Figure 2									
<i>A</i> : height of body	75 ± 2	102 ± 2	120 ± 5	120 ± 5	155 ± 5	135 ± 5	160 ± 5	250 ± 10	390 ± 10
<i>B</i> : height of vapour tube	60 ± 1	80 ± 2	95 ± 2	95 ± 2	135 ± 2	115 ± 2	140 ± 2	200 ± 3	310 ± 3
<i>C</i> : height of siphon tube	43 ± 1	58 ± 2	73 ± 2	73 ± 2	112 ± 2	93 ± 2	118 ± 3	165 ± 3	272 ± 5
<i>D</i> : height from top of cone joint to base of body	43 ± 2	43 ± 2	48 ± 2	48 ± 2	48 ± 2	48 ± 2	48 ± 2	117 ± 3	145 ± 5
<i>E</i> : minimum thickness of flange								5.0	6.0
<i>F</i> : nominal internal diameter at face of flange								75	100
<i>G</i> : nominal external diameter at face of flange								120	150

^a These sizes are fitted with a flat flange which is normally used with an adaptor and retaining clips [see Figure 2(b)].

Table 2 — Joint sizes and dimensions for type 3 Soxhlet extractors

Extractor features	Nominal capacity of extractor		
	20 mL	50 mL	100 mL
	mm	mm	mm
Socket joint size	34/35	45/40	55/44
Cone joint size	24/29	24/29	24/29
Outer body			
Internal diameter, min.	29	40	52
Wall thickness	2 ± 0.2	2.75 ± 0.25	2.5 ± 0.3
Inner body			
Internal diameter, min.	21	29	34
Wall thickness	1.2 ± 0.2	1.4 ± 0.2	1.4 ± 0.2
Syphon tube			
Internal diameter	2.4 ± 0.6	3.4 ± 0.8	3.4 ± 0.8
Wall thickness	0.8 ± 0.1	0.8 ± 0.2	0.8 ± 0.2
Dimensions shown in Figure 3:			
<i>A</i> : height of outer body	123 ± 5	132 ± 5	142 ± 5
<i>B</i> : height from top of cone joint to base of body	45 ± 5	50 ± 5	60 ± 5
<i>C</i> : height of inner body	100 ± 2	95 ± 2	100 ± 2
<i>D</i> : height of syphon tube above straight portion of inner body	75 ± 3	75 ± 3	70 ± 3
<i>E</i> : height of syphon tube below straight portion of inner body	55 ± 3	62 ± 3	82 ± 3

Appendix A Guidance on selection of flasks, condensers and thimbles for use with extractors

A.1 Flasks

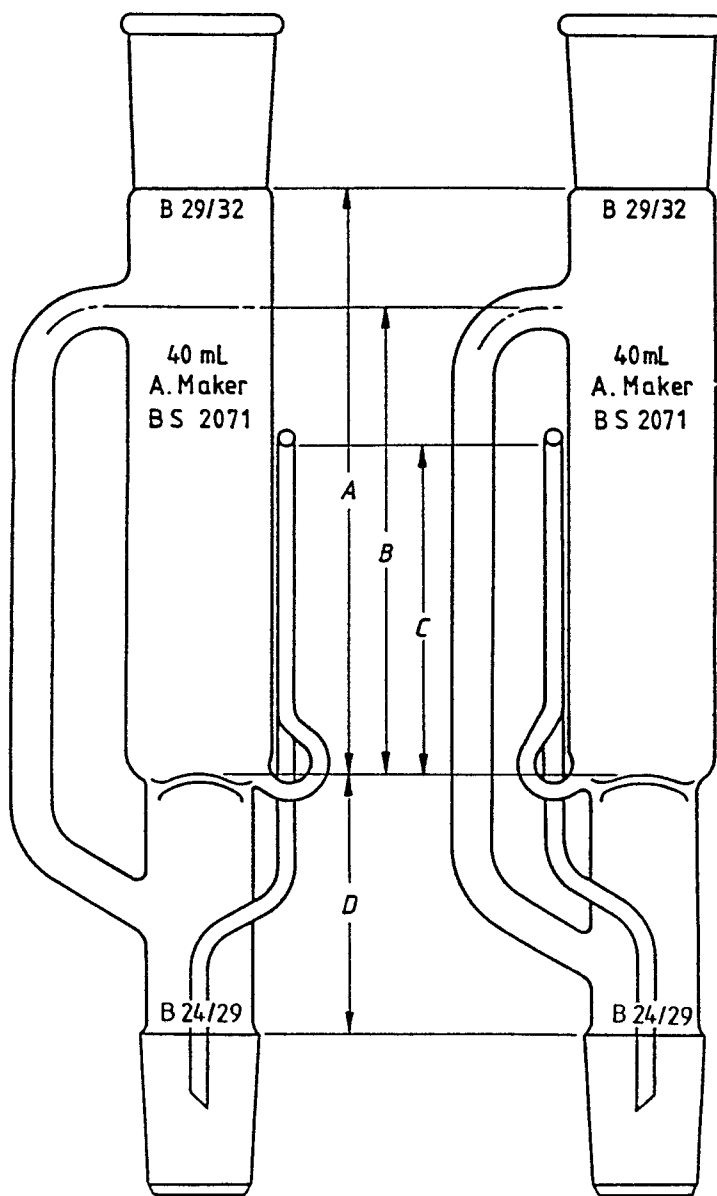
If a flask with a ground glass joint is to be used in conjunction with an extractor, the socket size of the flask joint should be compatible with the cone joint size specified in Table 1 or Table 2 for the extractor concerned.

A.2 Condensers

If a condenser with a ground glass joint is to be used in conjunction with an extractor, the cone size of the condenser joint should be compatible with the socket joint size specified in Table 1 or Table 2 for the extractor concerned.

A.3 Thimbles

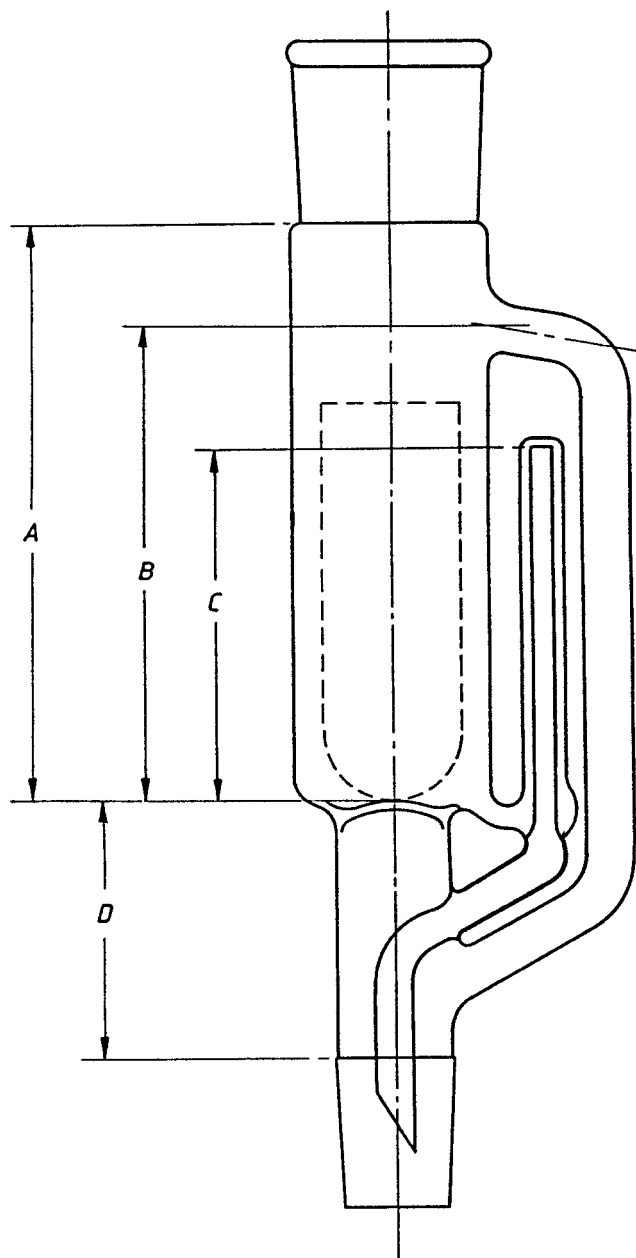
If an extraction thimble is used to contain the material to be extracted, the external diameter of the thimble should be such that it can pass easily through the upper portion of the extractor into the body and the height of the thimble such that, when inserted, the upper edge of the thimble is above the syphon arm of the extractor.



(a) Syphon tube and vapour tube on opposite sides

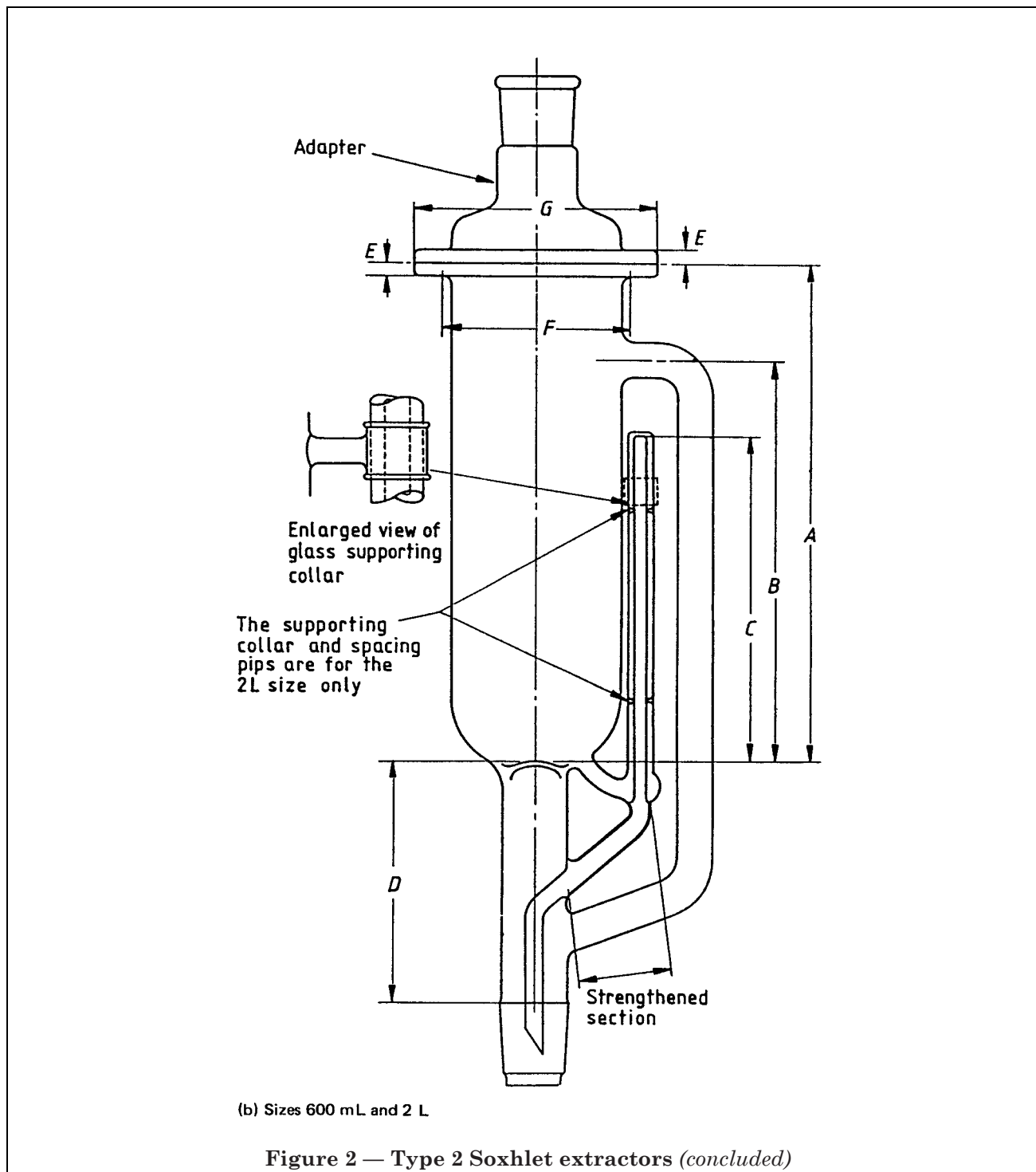
(b) Syphon tube and vapour tube on the same side

Figure 1 — Type 1 Soxhlet extractors (the 40 mL size is shown as an example)



(a) Sizes up to and including 200 mL

Figure 2 — Type 2 Soxhlet extractors (continued)



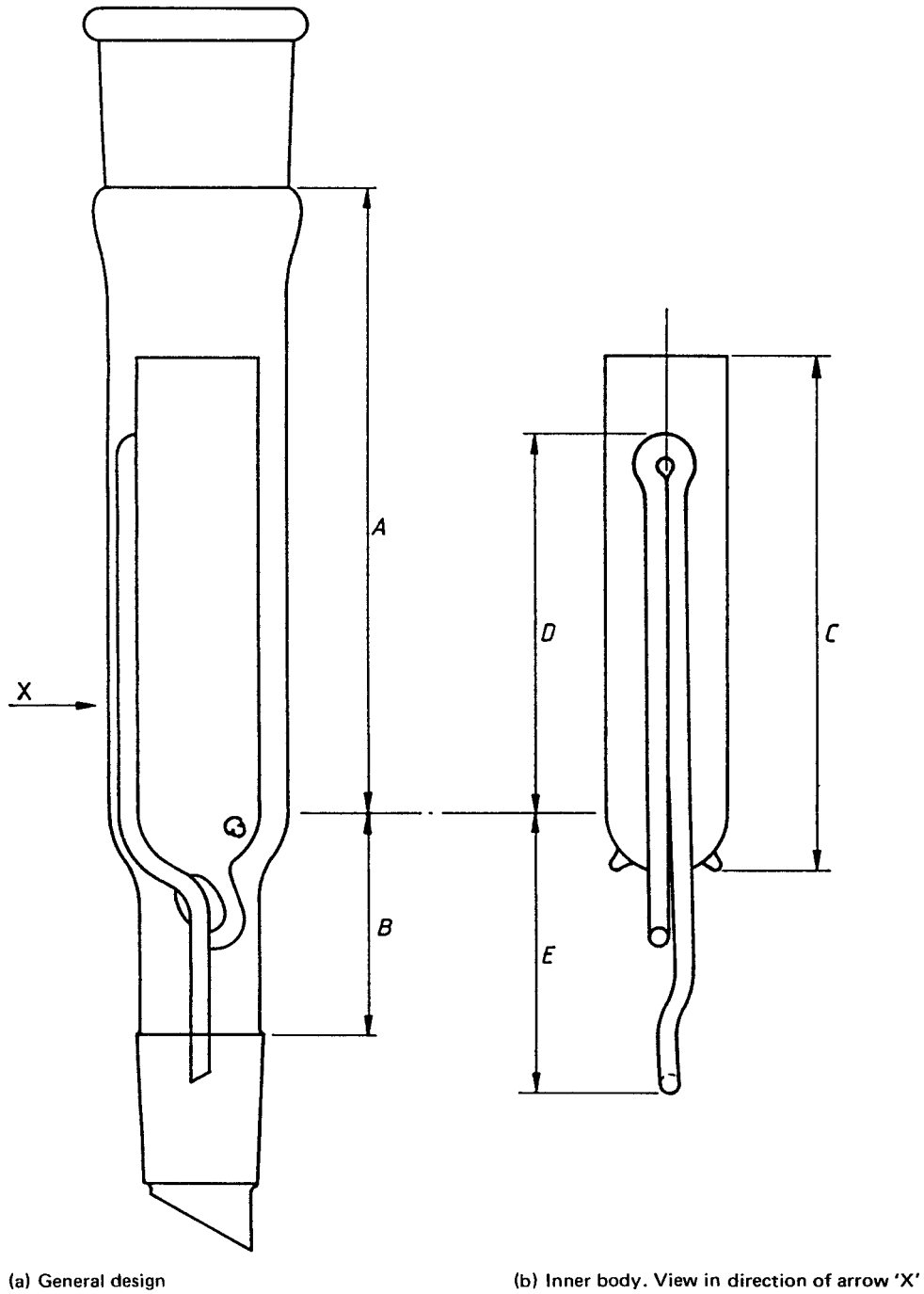


Figure 3 — Type 3 Soxhlet extractor

Publications referred to

BS 572, *Specification for interchangeable conical ground glass joints.*

BS 5750, *Quality systems*²⁾.

BS 5895, *Specification for borosilicate glass tubing for laboratory apparatus.*

²⁾ Referred to in the foreword only.

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