

CONFIRMED
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Specification for

Aluminium collapsible tubes

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Packaging and Freight Containers Standards Committee (PKM/-) to Technical Committee PKM/561 upon which the following bodies were represented:

- Engineering Equipment and Materials Users' Association
- International Tin Research Institute
- Metal Packaging Manufacturers' Association
- Ministry of Defence
- Paintmakers' Association of Great Britain Ltd.
- Society of British Printing Ink Manufacturers

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of the British Pharmaceutical Industry
- Collapsible Tube Manufacturers' Association
- Cosmetic, Toiletry and Perfumery Association Limited
- Pira (Research Association for the Paper and Board, Printing and Packaging Industries)

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Foreword

This British Standard has been prepared under the direction of the Packaging and Freight Containers Standards Committee. It revises and supersedes BS 2006:1966 which is withdrawn. BS 2006 was first issued in 1953 and later revised in 1966 to include dual metric and imperial dimensions. This revision refers solely to tubes with metric dimensions and includes metric sizes which have become accepted as standard since the publication of the last edition.

Whereas the 1966 edition related to tubes manufactured from aluminium, lead and tin, this revised edition applies to aluminium tubes only, since demand for tubes manufactured from lead and tin is now insignificant and tubes manufactured from such metals can be regarded as non-standard.

This edition applies only to tubes with short screwed metal nozzles as did the previous editions. There are many other types of nozzle which are required for specific products with special requirements. Such special requirements are not covered in detail by this standard. However, the general provisions of the standard, e.g. the main tube dimensions such as diameter and wall thickness, will apply for these non-standard tubes and will also apply for metal tubes which are fitted with applied plastics nozzles.

Details of metal collapsible tubes are given in this standard in a manner different from that adopted in BS 1133-10 for metal containers. BS 1133 is intended chiefly for guidance of those who may not have wide experience, whereas this standard specifies detailed requirements for aluminium collapsible tubes.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, 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 the diameters, lengths, wall thicknesses and shoulder thicknesses of aluminium collapsible tubes with short screwed nozzles.

Dimensions are given of the nozzles available for these tubes together with those of hard (rigid) plastics caps with V-threads and soft (flexible) plastics caps with both buttress and V-threads.

The material used in the manufacture of the tubes is specified, as are the requirements for closures, internal coatings, cleanliness and annealing of aluminium tubes, together with the appropriate tests.

NOTE The title of the publication referred to in this standard is given on the inside back cover.

2 Definitions

For the purposes of this British Standard, the following definitions apply.

2.1 collapsible tube

a cylinder of pliable metal which can be sealed in such a manner that its contents, although readily discharged in any desired quantity, are protected from contact with air or moisture during the whole period of use as a container

2.2 nozzle

the outlet of a collapsible tube, through which the contents are expelled by squeezing the wall of the tube

2.3 membrane nozzle

a nozzle which has the orifice closed by a thin diaphragm of metal which is capable of being pierced

2.4 orifice

the opening in the nozzle of the tube through which the contents are expelled

2.5 cap

a screw closure for the nozzle end of a collapsible tube

3 Materials, design and manufacture

3.1 Materials

Tubes shall be manufactured from aluminium of not less than 99.7 % purity.

3.2 Closing and sealing

The integrity of the seal between the cap and the tube shall be tested in accordance with one of the procedures described in Appendix A.

NOTE 1 The test to be used and the rejection limits for leaking tubes should be agreed between the purchaser and the manufacturer.

NOTE 2 The tube should be capable of producing a good end seal employing, where appropriate, an even application of an end sealing compound.

3.3 Annealing

Aluminium tubes of diameter not greater than 45 mm shall be so annealed that, when tested in accordance with Appendix B, the scale readings on the test apparatus shall be not higher than the values given in Table 1.

Table 1 — Annealing test limits

Diameter	Maximum reading
mm	mm
10	8 ^a
13,5	11 ^a
16	6
19	8
22	10
25	15
28	19
30	20
32	22
35	25
38	27
40	28
45	35

^a Using the auxiliary base plate (see Figure 7).

3.4 Internal coating¹⁾

3.4.1 Continuity. Internally coated tubes, when tested in accordance with Appendix C, shall comply with the limits given in Table 2

¹⁾ In the case of polymerizing lacquers a visual colour test may be applied with limits of colour variation agreed between the purchaser and the manufacturer.

Table 2 — Continuity of internal coating limits

Tube diameter	Limits for internally lacquered or waxed tubes	Limits for internally lacquered and waxed tubes
mm	mA	mA
10	70	10
13.5	75	10
16	80	10
19	85	10
22	90	10
25	95	10
28	100	10
30	100	10
32	100	10
35	105	10
38	110	10
40	110	10
45	115	10

NOTE These limits are to be regarded as the maximum permitted in any single tube in a sample taken according to a procedure to be agreed between the manufacturer and the purchaser.

3.4.2 Flexibility and adhesion. When the test described in Appendix D is applied there shall be no fracture or lifting of the coating.

4 Dimensions

4.1 General

The dimensions and shoulder angles of collapsible tubes shall be in accordance with Table 3.

NOTE When specifying collapsible tubes, the purchaser's requirements should be stated in the following order:

- diameter;
- length;
- nozzle diameter;
- orifice diameter (when a choice is available).

The purchaser should also specify whether any form of identification is required, e.g. marking with the manufacturer's name, initials, or recognized trade mark and date of manufacture. Full details of the caps to be used should also be given. The nomenclature of collapsible tubes is given in Figure 1.

4.2 Nozzles

The dimensions of metal nozzles for collapsible tubes shall be in accordance with Table 4, Table 6 or Table 8 (according to the type of nozzle) and the nozzles shall be designated by the numbers given in column 5 of Table 3.

NOTE 1 It is common practice to designate all nozzle and cap sizes, except those of buttress threaded nozzles and caps, by a number which is 10 times the nominal major thread diameter in millimetres, e.g. if the nominal major thread diameter is 9.5 mm, the nozzle and cap size is 95. In the case of buttress threaded nozzles and caps the numbers are the nearest equivalent to the standard V-thread nozzle sizes, and these numbers are followed by the letter B.

NOTE 2 Thread length and nozzle length are not necessarily identical. Membrane nozzles are illustrated in Figure 2.

4.3 Caps

The internal dimensions of moulded caps for use with nozzles specified in 4.1 and 4.2 shall be in accordance with Table 5, Table 7 or Table 9 (according to the type of cap).

The internal depth shall be adapted in all cases to suit the individual method of sealing in order to comply with the requirements of 3.2.

NOTE For this reason the standard does not specify this dimension.

5 Cleanliness

The tubes shall be clean, i.e. the thread form shall be free from extraneous foreign matter and from metal slivers, when tested in accordance with Appendix E.

NOTE 1 Where more specific standards of cleanliness are required, they should be agreed between the purchaser and the manufacturer.

NOTE 2 It is the purchaser's responsibility to ensure that there is no reaction between the product and the tube which might render the contents unsuitable for their intended use.

NOTE 3 The tubes should be packed in such a way that the risk of contamination with particulate matter or of physical damage is minimized.