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AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race St. Philadelphia, Pa 19103

Standard Specification for Rubber Finger Cots[1]

This standard is issued under the fixed designation D 3772; 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.

ε1 NOTE—Section 11 on Keywords, was added editorially in March 1991.

1. Scope

1.1 This specification covers the requirements for finger cots made from rubber latex and used for health purposes. The purpose of this specification is to obtain consistent performance among products produced in various locations or at various times in the same location.

1.2 This specification does not cover the safe and proper use of finger cots or products of special construction for special use, for example, finger cots used in the electronics industry.

1.3 The values stated in SI units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 412 Test Methods for Rubber Properties in Tension[2]

D 573 Test Method for Rubber—Deterioration in an Air Oven[3]

D 865 Test Method for Rubber—Deterioration by Heating in Air (Test Tube Enclosure)[3]

D 1076 Specification for Rubber—Concentrated, Ammonia Preserved, Creamed, and Centrifuged Natural Latex[3]

D 3767 Practice for Rubber—Measurement of Dimensions[3]

2.2 *Other Documents:*

ISO 2859 Sampling Procedures and Tables for Inspection by Attributes[4]

Code of Federal Regulations, Title 21—Food and Drug Administration, Part 177[5]

3. Classification

3.1 *Types:*

3.1.1 Type 1—Rolled.

3.1.2 Type 2—Flat.

3.2 *Sizes*—The sizes covered are small, medium, large, and extra-large.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Reference to this ASTM designation (D 3772) and year of issue,

4.1.2 Type, and

4.1.3 Size.

5. Materials and Manufacture

5.1 Finger cots shall be manufactured from good-quality latex conforming to Specification D 1076.

5.2 Finger cots shall be free of embedded grit or discoloration, but may be transparent, opaque, or colored.

5.3 Finger cots and any dressing materials applied to them shall not liberate substances known to be toxic or otherwise harmful under normal conditions of use. Any dressing or compounding materials shall not have a deleterious effect on the rubber and shall be permitted by the Code of Federal Regulations, Title 21, Section 172.2600 on Rubber Articles Intended for Repeated Use, that lists materials safe for use in food packaging. Other materials may be used if their safety and efficacy have been established previously.

NOTE 1—For guidance, it is recommended that CFR, Title 21, Part 177 be used. Other materials may be used if their safety and efficiency have been established previously.

6. Design

6.1 *Rim*—The open end of the finger cot shall terminate in an integral rim.

6.2 *Dimensions*—The length shall be 70 ± 5 mm and the thickness shall be 0.09 ± 0.03 mm. The width of the various sizes shall be as follows: small, 24 ± 2 mm; medium, 28 ± 2 mm; large, 30 ± 2 mm; extra large, 34.5 ± 2.5 mm.

6.3 *Sampling*—Take ten finger cots at random from each lot. The number of cots in a lot shall not exceed 144 000. If one or more cots fail to meet the requirements in accordance with 6.1 or 6.2, the lot may be rejected or retested (see Section 8).

NOTE 2—This requirement corresponds approximately to an accepted quality level (AQL) of 2.5 and inspection level S-1.

6.4 *Testing*—Measure the length of the finger cot to the nearest 1 mm. Measure the width to the nearest 0.5 mm at a distance at least 5 mm from the ends. Measure the thickness to the nearest 0.002 mm at a distance about 5 mm from the open end, on specimens from which any lubricant has been removed with water or isopropanol. The thickness micrometer shall conform to Test Methods D 412, except for the smaller-scale graduations.

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[1] This specification is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.40 on Consumer Rubber Products.

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[2] *Annual Book of ASTM Standards*, Vols 09.01 and 09.02.

[3] *Annual Book of ASTM Standards*, Vol 09.01.

[4] Available from American National Standards Institute, 1430 Broadway, New York, NY 10018.

[5] Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

6.5 The precision and bias for measuring dimensions are as specified in Practice D 3767.

7. Physical Properties

7.1 Finger cots shall meet the following minimum requirements:

Tensile Strength (MPa)	
Mean	Specimen
24	18
20	18
20	18

7.2 *Sampling*—Take 25 finger cots at random from each lot. The number of cots in a lot shall not exceed 144 000. If more than 1 of the 25 values for individual specimens are below specimen requirement or if the mean of 25 values is below the mean requirement, the lot may be rejected or retested (see Section 8).

NOTE 3—This requirement corresponds approximately to an accepted quality level (AQL) of 1.5 and inspection level S-3.

7.3 *Testing:*

7.3.1 Condition finger cots to be subjected to accelerated aging for 166 ± 2 h at 70 ± 2°C, or for 22 ± 0.3 h at 100 ± 2°C in accordance with Test Methods D 573 or D 865. For referee tests, condition for 166 ± 2 h at 70 ± 1°C, in accordance with Test Method D 573.

7.3.2 If Test Method D 573 is used, do not age finger cots of different composition at the same time in the same oven. Age finger cots in original packages. Condition both aged and unaged finger cots at 23 ± 2°C for not less than 16 h before testing.

7.3.3 Determine the ultimate elongation in accordance with Test Methods D 412. Use ring specimens cut perpendicular to the length direction of the finger cots with a die having cutting edges spaced 20.0 ± 0.1 mm apart and longer than the width of the cot. Cut the specimen near the center of the length, rejecting any specimen not cut with a single impact of the die. Measure the specimen width of the flattened ring to the nearest 0.5 mm and multiply by two to obtain the circumference of the ring. Use a tester having a grip separation speed of 8.5 ± 0.8 mm/s, and roller grips at least 20 mm in width, about 5 mm in diameter, lubricated on the surface with castor oil or other effective rubber lubricant.

7.3.4 Calculate the ultimate elongation, E, in percent as follows:

$$E = 100\,(2D + G - C)/C$$

where:

C = circumference of specimen,
D = distance between centers of roller grips at break, and
G = circumference of one roller grip.

7.4 The precision and bias of determining tensile strength and ultimate elongation are as specified in Test Methods D 412.

8. Retest

8.1 One retest is permitted before rejection of lots not conforming to the requirements in Sections 6 and 7.

9. Inspection

9.1 Finger cots shall be inspected for tears, holes, embedded particles, foreign material, and adhering surfaces manifested by Type 1 cots failing to unroll easily and Type 2 cots adhering to each other or restricting admission of the finger. If the order specifies type of lubricant, inspect finger cots for the specified type.

9.2 Finger cots shall be sampled for inspection in accordance with ISO 2859, special inspection level S-2, acceptable quality level (AQL) 2.5, multiple sampling procedure, and normal inspection.

10. Packaging and Package Marking

10.1 Unless otherwise specified, packaging shall be in accordance with the manufacturer's commercial practice to protect finger cots during transportation and storage.

10.2 Instructions shall be included on proper storage to assure long life, emphasizing the need for storage in a cool place where mechanical damage is not likely and there is no contact with oil-based antiseptics, phenols and their derivatives, petroleum-based products, or other material harmful to rubber.

11. Keyword

11.1 finger cots