



Standard Specification for Natural Rubber Finger Cots¹

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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the requirements for finger cots made from natural rubber latex. 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.

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

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension

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

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

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

D 3767 Practice for Rubber—Measurement of Dimensions

2.2 *Other Documents:*

ISO 2859 Sampling Procedures and Tables for Inspection by Attributes³

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

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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.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

Code of Federal Regulations, Title 21—Food and Drug Administration, Part 177⁴

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,

4.1.3 Thickness (if different than that specified), and

4.1.4 Size.

5. Materials and Manufacture

5.1 Finger cots shall be manufactured from 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, Food and Drug Administration, Section 177.2600 on Rubber Articles Intended for Repeated Use, that lists materials safe for use as indirect food additives. Other materials may be used if their safety and efficacy have been established previously.

6. Performance

6.1 Finger cots sampled in accordance with Section 7, shall meet the following performance requirements:

⁴ Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

TABLE 1 Performance Requirements

Characteristic	Related Defects	Inspection Level	AQL
Dimensions	length, thickness, width	S-2	4.0
Physical Properties	before aging, after accelerated aging	S-2	4.0
Inspection	tears, holes, embedded particles, foreign matter, adhering surfaces	S-2	4.0

6.1.1 Have consistent physical dimensions in accordance with 8.2.2.

6.1.2 Have acceptable physical property characteristics in accordance with 8.3.

6.1.3 Meet the inspection criteria as specified in 8.4.

7. Sampling

7.1 Finger cots shall be sampled and inspected in accordance with ISO 2859. The inspection levels and acceptable quality levels (AQL) shall conform to those specified in Table 1, or as agreed between the purchaser and seller.

8. Test Methods

8.1 The following tests shall be conducted to ensure the requirements of Section 9 are met as prescribed in Table 1.

8.2 Design:

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

8.2.2 *Physical Dimensions*—The length shall be 70 ± 5 mm. The thickness shall be 0.09 ± 0.03 mm or as agreed upon by the manufacturer and end user. 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.

8.2.3 *Sampling*—Sampling shall be conducted according to the inspection level and AQL specified in Table 1.

8.2.4 *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.

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

8.3 Physical Properties:

8.3.1 Finger cots shall meet the minimum requirements specified in Table 2.

8.3.2 *Sampling*—Sampling shall be conducted according to the inspection level and AQL specified in Table 1.

8.3.3 Testing:

8.3.3.1 Condition finger cots to be subjected to accelerated aging for 166 ± 2 h at $70 \pm 2^\circ\text{C}$, or for 22 ± 0.3 h at $100 \pm 2^\circ\text{C}$ in accordance with Test Methods D 573 or D 865. For

referee tests, condition for 166 ± 2 h at $70 \pm 1^\circ\text{C}$, in accordance with Test Method D 573.

8.3.3.2 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 $23 \pm 2^\circ\text{C}$ for not less than 16 h before testing.

8.3.3.3 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.

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

$$E = 100 (2D + G - C)/C \quad (1)$$

where:

C = circumference of specimen,

D = distance between centers of roller grips at break, and

G = circumference of one roller grip.

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

8.4 Inspection:

8.4.1 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.

8.4.2 Finger cots shall be sampled for inspection according to the inspection level and AQL specified in Table 2.

9. Acceptance

9.1 Finger cots will be considered to meet the performance requirements when test results do not exceed the AQL prescribed in Table 2.

9.2 Reinspection is permissible under the provisions of ISO 2859.

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. Keywords

11.1 finger cots; natural rubber finger cots

TABLE 2 Physical Properties

	Tensile Strength (MPa)	
	Mean (Average)	Specimen
Original	24	18
Aged	20	18

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